



July 2024

Kittitas County Conservation District Voluntary Stewardship Monitoring Plan

Voluntary Stewardship Program Monitoring Plan



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Prepared for

Kittitas County Conservation District
2211 West Dolarway Road, Suite 4
Ellensburg, Washington 98926

Prepared with assistance from

Anchor QEA
1201 3rd Avenue, Suite 2600
Seattle, Washington 98101

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ABBREVIATIONS

BMP	best management practice
CARA	critical aquifer recharge area
cfs	cubic foot per second
County	Kittitas County
CPPE	Conservation Practice Physical Effects
Ecology	Washington State Department of Ecology
EQIP	Environmental Quality Incentives Program
FFA	frequently flooded area
FWHCA	Fish and Wildlife Habitat Conservation Area
GHA	geologically hazardous area
GMA	Growth Management Act
HRCD	High-Resolution Change Detection
KCCD	Kittitas County Conservation District
KCWP	Kittitas County Water Purveyors
KRD	Kittitas Reclamation District
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
PHS	Priority Habitat and Species
PIT	passive integrated transponder
RCPP	USDA NRCS Regional Conservation Partnership Program
RCW	Revised Code of Washington
SCC	Washington State Conservation Commission
SCC Monitoring Guidelines	<i>Watershed Monitoring Project Development Guide for the Voluntary Stewardship Program in Washington</i>
SOP	Standard Operation Procedure
TMDL	Total Maximum Daily Load
USDA	U.S. Department of Agriculture
VSP	Voluntary Stewardship Program
Watershed Group	Kittitas County Voluntary Stewardship Program Watershed Group
WDFW	Washington State Department of Fish and Wildlife
Work Plan	Kittitas County Conservation District <i>Voluntary Stewardship Program Work Plan</i>
WRIA	Water Resource Inventory Areas
WSDA	Washington State Department of Agriculture
WSRRI	Washington Shrubsteppe Restoration and Resiliency Initiative

1 Introduction

This monitoring plan builds on the Monitoring, Reporting, & Adaptive Management section of the Kittitas County (County) *Voluntary Stewardship Program Work Plan* (Work Plan; County 2018) that was approved by the Washington State Conservation Commission (SCC) on April 27, 2018. This monitoring plan was developed collaboratively with Kittitas County Conservation District (KCCD), the Kittitas County Voluntary Stewardship Program (VSP) Watershed Group (Watershed Group), input from SCC VSP staff, and with the guidance of the *Watershed Monitoring Project Development Guide for the Voluntary Stewardship Program in Washington* (SCC Monitoring Guidelines; SCC 2023).

1.1 Monitoring Plan Purpose

The purpose of this plan is based on the following guidance from the SCC Monitoring Guidelines (2023):

Monitoring is an essential component of the Voluntary Stewardship Program (VSP). Effective monitoring is required in order to determine whether counties are meeting the goals and benchmarks defined in each county's VSP work plan. While these goals and benchmarks encompass a variety of themes—such as stakeholder participation, implementation of agricultural stewardship practices, and critical area functions and values—effective, accurate, and actionable monitoring is a unifying keystone between all themes within VSP...Developing a monitoring plan, based on the framework established in the guide and references cited within, will help watershed work groups have confidence that the monitoring activities they are conducting, or the monitoring information they are utilizing, will be useful and informative for VSP. Moreover, a clear monitoring plan clarifies expectations of what questions or themes VSP monitoring can conclusively address. A plan ensures that the monitoring questions will be adequately addressed before data is collected. The additional benefits of having a plan are reduced costs and having a roadmap to help with program continuity as personnel and watershed work group membership changes through time.

1.2 Monitoring Plan Development

The monitoring plan has been developed by KCCD based on the monitoring and adaptive management framework in the Kittitas County VSP Work Plan. This plan is further informed by comments received from the Watershed Group, VSP Technical Panel, and Washington State Conservation Commission on Kittitas' prior 2-year and 5-year VSP monitoring reports.

2 Overview of the Kittitas County VSP

2.1 Implementation of VSP

The VSP was established in 2011 by the Washington State Legislature to create a nonregulatory approach to meet the goals of the Growth Management Act (GMA). The VSP addresses reoccurring GMA regulatory and legislative conflicts between critical areas protection and agricultural land use. An alternative to regulatory enforcement, VSP engages landowners to implement voluntary stewardship practices to protect critical areas at a watershed scale while maintaining agricultural viability. VSP aims to engage agricultural landowners and monitor effects of agricultural practices in areas where agricultural land intersects with critical areas. The County has been enrolled in VSP since November 17, 2015. The design of an effective, accurate, and actionable VSP monitoring plan will support the County in its aims to protect and enhance both critical areas and agricultural viability through voluntary stewardship.

2.2 Work Plan Goals and Benchmarks

The VSP framework requires that each county develop a Work Plan that sets goals and benchmarks for “stakeholder participation, implementation of conservation practices, and protection and enhancement of critical area functions and values through voluntary, incentive-based measures” (SCC 2023). Goals and benchmarks are then monitored using metrics established in the Work Plan and reported upon at 2- and 5-year intervals. Monitoring metrics are used to evaluate positive, negative, or neutral change from the VSP baseline date of July 22, 2011. Protection goals are achieved if there is no degradation below the statutory 2011 baseline. Enhancements goals are achieved if there is improvement to processes, structure, and functions of the baseline. The statutory baseline against which all goals and benchmarks are assessed is July 22, 2011 (Revised Code of Washington [RCW] 36.70A.703(4)).

The County’s VSP goals and benchmarks are as outlined in Table 1.

Table 1

KCCD Voluntary Stewardship Work Plan Goals and Benchmarks

Goal	Benchmarks/Objectives
Participation	
Promote producer participation in voluntary stewardship of agricultural lands and critical areas to meet the protection and enhancement benchmarks and protect critical areas functions and values at a County-wide watershed level.	Benchmarks
	Sufficient active participation by commercial and non-commercial agricultural operators (farmers and ranchers) over 10 years that achieves the protection of critical area functions and values at a County-wide watershed level.
	Passive participation by commercial and non-commercial agricultural operators in VSP stewardship practices is maintained or increased over 10 years on agricultural land.
Technical assistance and outreach are provided to agricultural producers to encourage stewardship practices and VSP participation.	
Protection and Enhancement	
Protection and enhancement goals are each associated with a critical area, which include wetlands, FWHCAs, FFAs, CARAs, and GHAs. All critical areas have the same protection and enhancement benchmarks.	Benchmarks
	<p>Protection: No net loss of acres managed under stewardship practices; no net loss of feet or units managed for protection.</p> <p>Enhancement: Enrolled enhancement units (e.g., acres and feet) are sufficient to offset identified agricultural degradation and maintain baseline conditions based on implemented projects from 2011 to 2017 and excluded protection benchmarks (estimated annual reduction).</p>
<p>Wetlands: Protect and enhance wetland functions.</p> <p>Key Critical Area Functions:</p> <ul style="list-style-type: none"> • Water Quality • Hydrology • Habitat <p>Key Stewardship Practice Types:</p> <ul style="list-style-type: none"> • Water Management • Nutrient Management • Pest Management • Soil Management • Range Management • Habitat Management • Steam Enhancement 	Objectives
	Protect and voluntarily enhance acres managed using practices that provide direct protection to wetlands and wetland buffers.
	Protect and enhance acres managed using practices that promote water quality and hydrology functions by reducing erosion and improving water storage and filtration.
Protect and enhance acres managed using practices that promote water quality and aquatic habitat functions by reducing inputs from runoff.	

Goal	Benchmarks/Objectives
<p>Fish and Wildlife Habitat Conservation Areas: Protect and enhance FWHCA functions.</p> <p>Key Critical Area Functions:</p> <ul style="list-style-type: none"> • Water Quality • Hydrology • Soil • Habitat <p>Key Stewardship Practice Types:</p> <ul style="list-style-type: none"> • Water Management • Nutrient Management • Pest Management • Soil Management • Range Management • Habitat Management • Steam Enhancement 	<p>Objectives</p> <p>Protect and enhance acres managed using practices that promote habitat functions by restoring or creating new habitat structures.</p> <p>Protect and enhance acres managed using practices that promote habitat functions by limiting trampling of habitat.</p> <p>Protect and enhance acre managed using strategies that promote water availability for aquatic species and agricultural benefits.</p> <p>Protect and enhance acres managed using strategies to protect fish-bearing streams and limit shoreline and watercourse degradation and enhance shoreline areas and watercourses.</p> <p>Protect and enhance acres managed using practices that promote water quality and aquatic habitat functions by reducing inputs from runoff (surface water quality).</p> <p>Protect and enhance perennial grass vegetation in shrubsteppe areas.</p>
<p>Critical Aquifer Recharge Areas: Protect and enhance CARA functions.</p> <p>Key Critical Area Functions:</p> <ul style="list-style-type: none"> • Water Quality • Hydrology <p>Key Stewardship Practice Types:</p> <ul style="list-style-type: none"> • Water Management • Nutrient Management • Pest Management 	<p>Objectives</p> <p>Protect and enhance acres managed to protect shallow groundwater wells by managing chemical and nutrient input controls.</p> <p>Protect and enhance acres managed to promote natural groundwater filtration functions.</p> <p>Protect and enhance acres managed to promote hydrology functions by improving water conservation.</p>
<p>Geologically Hazardous Areas: Protect and enhance GHA (erosion hazard) functions.</p> <p>Key Critical Area Functions:</p> <ul style="list-style-type: none"> • Water Quality • Hydrology • Soil • Habitat <p>Key Stewardship Practice Types:</p> <ul style="list-style-type: none"> • Water Management • Pest Management • Soil Management • Range Management • Habitat Management • Steam Enhancement 	<p>Objectives</p> <p>Protect and enhance acres managed using practices that promote water quality, hydrology, soil, and habitat functions by reducing erosion and wildfire risk and improving water storage and filtration.</p>

Goal	Benchmarks/Objectives
<p>Frequently Flooded Areas: Protect and enhance FFA functions.</p> <p>Key Critical Area Functions:</p> <ul style="list-style-type: none"> • Water Quality • Hydrology • Soil • Habitat <p>Key Stewardship Practice Types:</p> <ul style="list-style-type: none"> • Range Management • Habitat Management 	<p>Objectives</p>
	<p>Protect and enhance FFAs directly.</p>
	<p>Protect and enhance acres managed using techniques that limit soil compaction or trampling of habitat.</p> <p>Protect and enhance acres managed using strategies that promote water quality, hydrology, soil, and habitat functions by reducing erosion and improving water storage and filtration.</p>

Note:
Information sourced from KCCD 2018, 2021.

3 Background and Context

Kittitas County is located in central Washington and defined by the Cascade Mountains to the west and the Columbia River to the east. More than 70% of the County is publicly owned. Private lands are highly influenced by the availability of irrigation water, which allows significant crop production by providing water to agricultural lands. Irrigation infrastructure includes reservoirs and delivery systems, maintained by the U.S. Bureau of Reclamation and/or irrigation districts, and companies (County 2018, p. 6).

3.1 Kittitas County Agriculture

Agriculture on privately owned lands is generally associated with irrigated crops and pasture, dryland crops, orchards and vineyards, and rangelands. The 2022 Census of Agriculture cites acres of land in farms at 165,205 (down from 183,124 in 2012) with an average size of 224 acres (up from 182 acres in 2012). The total market value of \$75,568,000 worth of products sold, is a change from \$68,911,000 in 2012 (or roughly \$87,517,000 in 2022 dollars).

3.2 KCCD VSP Work Plan Sub-basins

The County includes portions of three watersheds, or Water Resource Inventory Areas (WRIAs). The watershed that overlaps the most with the County is the Upper Yakima (WRIA 39) and a small portion of the eastern County is in the Alkali-Squilchuck (WRIA 40). The Naches (WRIA 38) watershed also occurs within the County, but it is not included in VSP because there is no agricultural activity on private lands within it. Monitoring protocols require that monitoring data be organized by watershed areas defined in the Work Plan, if possible. If a dataset is useful for VSP monitoring but cannot be subdivided into sub-basins, this is also noted in the monitoring plan. Watersheds for the purposes of VSP monitoring include the following:

- WRIA 39 (Upper Yakima)
- WRIA 40 (Alkali-Squilchuck)

3.3 Critical Areas of Kittitas County Where Agricultural Activities Occur

The Work Plan provides the following background for critical areas specific to Kittitas County.

3.3.1 *Wetlands*

Wetlands in Kittitas County are concentrated near streams and waterways that are correlated with agricultural areas. In other words, most wetlands in the County are associated with irrigated agricultural activities or large river floodplains. They are mostly associated with irrigated areas with only a small amount in rangelands. The dimensions of County wetlands are influenced by ongoing irrigation water management practices, including water use efficiency and stewardship practices for the delivery and application of irrigation water. These practices affect the volume and timing of surface water available

to support some wetlands. Increasing the efficiency of water management practices affects the size and number of wetlands and associated habitats within the County (County 2018, p. 24).

3.3.2 Fish and Wildlife Habitat Conservation Areas

3.3.2.1 Streams and Riparian Areas

Kittitas County has two large river systems, the Yakima River and the Columbia River. There are approximately 1,374 stream miles that flow across agricultural lands in the County. Known fish-bearing streams make up less than 30% of stream miles. Fish-bearing streams support fish species such as spring Chinook salmon, steelhead, and bull trout (County 2018, p. 28).

3.3.2.2 Riparian Vegetation

The Work Plan defines riparian habitat as “the area adjacent to rivers, perennial or intermittent streams, seeps, springs etc. that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other” (County 2018, p. 28). Riparian habitat includes the entire extent of vegetation adapted to wet conditions as well as adjacent upland plant communities that influence the stream system directly. The natural riparian areas within the County’s agricultural areas are typically forested with trees and shrubs. Fish and wildlife rely on riparian vegetation for forage and breeding habitat. Riparian vegetation reduces siltation through trapping sediments and moderates in-water temperatures by providing vegetative shade (County 2018, p. 28).

3.3.2.3 Priority Habitat and Species

Priority Habitat and Species (PHS)-mapped areas are the largest critical area found within the County. A majority of the PHS area in the County is associated with large mammals such as mule deer and elk. Much of this occurs in the Forested and Shrubsteppe Upland community areas and is concentrated on rangelands. Shrubsteppe habitat covers a large portion of the agricultural lands in the County and covers a majority of the Shrubsteppe Upland Community Area. Greater sage grouse is a critical keystone species for shrubsteppe habitat.

3.3.3 Critical Aquifer Recharge Areas

Aquifer and groundwater recharge areas are important to both critical areas functions and agricultural viability. Critical aquifer recharge areas (CARAs) protections in Kittitas County were updated in 2022. These will replace the wellhead protection areas used in the Work Plan to approximate the agricultural and CARA intersects. Wellhead protection areas act to protect groundwater immediately adjacent to drinking wells (approximated as a 100-foot buffer around Group A and B wells) (County 2018, p. 33). In addition to those areas all areas of unconsolidated deposits within the Roslyn and Kittitas basins will be included as CARAs going forward.

3.3.4 Geologically Hazardous Areas

There are no designated geologically hazardous areas (GHAs) that pertain to agricultural areas in Kittitas County. However, the Critical Areas Ordinance designates GHAs to protect structures as well as minimize impacts to water quality and fish and wildlife. Steep slopes and erosion hazards as they pertain to agricultural lands are discussed under GHA in this VSP due to their potential impacts to water quality and fish and wildlife habitat, which are critical area functions. Because updated GHA mapping was not yet available, the Work Plan used hazardous slopes (25% slope or greater) to approximate the intersection of GHAs and agricultural lands. Steep slopes are mainly concentrated in County rangeland areas, which are also associated with high incidence of landslides. No hazardous slopes intersect with irrigated areas and very few intersect with dryland operations (County 2018, p. 35).

3.3.5 Frequently Flooded Areas

In Kittitas County, frequently flooded areas (FFAs) typically overlap or are adjacent to wetlands and some Fish and Wildlife Habitat Conservation Areas (FWHCAs).

3.4 Functions and Values of Interest

VSP legislation requires that work plans develop goals and benchmarks to protect and enhance critical area functions and values (RCW 36.70A.720(1)(e)). The key functions and values provided by the five critical areas in the County can be summarized into four key functions, which include the following: 1) water quality; 2) hydrology; 3) soil; and 4) fish and wildlife habitat (County 2018, p. 21). Table 2 summarizes the key functions associated with each critical area.

Table 2
Critical Area Functions

Critical Areas	Key Functions			
	Water Quality	Hydrology	Soil Function	Habitat
Wetlands	●	●		●
FWHCAs	●	●	●	●
CARAs	●	●		
GHAs (Erosion)	●	●	●	●
FFAs	●	●	●	●

3.4.1 Water Quality

Critical areas such as stream channels, riparian areas, and wetlands are part of the aquatic ecosystem that filters and retains excess fine sediments and cycles out excessive nutrients (such as phosphorus and nitrogen) and other pollutants. The clean water these functions provide is essential for supporting habitat for fish and other aquatic species. In addition, critical areas help moderate water temperatures by providing vegetative shade and cooler water from recharged groundwater. This supports the maintenance of cooler in-water temperatures and dissolved oxygen levels needed by aquatic species (County 2018, p. 21).

3.4.2 Hydrology

Hydrology is the process of water delivery, movement, and storage. In an ecosystem, hydrology is affected by landform, geology, soil characteristics and moisture content, and climate (including precipitation) (County 2018, p. 21). Surface and shallow subsurface runoff are the primary sources of water delivery to streams and, in some cases, from groundwater. Stream channels, riparian areas, and wetlands are also a part of the aquatic ecosystem that stores and transports water and sediment, maintains base flows, and can support vegetation and microorganism communities (County 2018, p. 21).

3.4.3 Soil Function

Soil provides an underground living ecosystem that supports plants, animals, and human life. Soil conservation in the County supports healthy soils that have the following qualities: 1) reduced susceptibility to erosion; 2) hold and slowly release water; 3) filter pollutants and, in many cases, detoxify them; 4) store, transform, and cycle nutrients; and 5) physically support plants (County 2018, p. 22).

3.4.4 Fish and Wildlife Habitat

Habitats are the natural environment in which a particular species or population can live. Different species have unique habitat requirements and can be unique for different life stages of a species. Loss of habitat is the primary threat to the survival of many native species (County 2018, p. 22).

4 Review of Monitoring Protocols

4.1 VSP Monitoring Requirements (2- and 5-Year)

Each VSP watershed work group must conduct a self-assessment every 5 years to evaluate whether they are meeting their goals and benchmarks. They are required to submit this information in a report to the State (SCC 2023).

4.2 VSP Roles and Responsibilities

4.2.1 *Role of the Watershed Advisory Group and County*

The Work Plan was developed by the Watershed Group, convened by the County and comprising agricultural producers, local government elected officials and staff, agency representatives, the Yakama Nation, and interest groups.

RCW 36.70A.720 describes the duties of the Watershed Group, the most important of which is to develop the Work Plan. To that end, the advisory panel worked with County staff to develop the draft text of this Work Plan, while the technical review panel members were asked to provide written feedback on technical aspects of the draft plan.

According to the statute, the Watershed Group will do the following: 1) conduct periodic evaluation; 2) institute adaptive management and provide a written report of the status of plans and accomplishments to the County and to the commission within 60 days after the end of each biennium; 3) assist State agencies in their monitoring programs; and 4) satisfy any other reporting requirements of the program.

4.2.2 *Role of the SCC in VSP Monitoring*

Works plans and VSP reporting are evaluated by the VSP Technical Panel, composed of members from the SCC, Washington Department of Fish and Wildlife (WDFW), Washington State Department of Ecology (Ecology), and Washington State Department of Agriculture (WSDA). Each member of the Technical Panel reviews the 5-year reports and decides whether to agree, partly agree, or disagree with each watershed work group's assertions. Each agency's assessment, along with the County's 5-year report, is provided to the SCC Executive Director for their consideration. These reports use information from each county's various monitoring approaches to provide evidence demonstrating whether goals and benchmarks are being met.

4.2.3 *Role of the KCCD*

Kittitas County delegates local implementation of VSP to KCCD through an interlocal agreement renewed at the beginning of each biennium. The KCCD, under the direction of the Watershed Group,

led the development of the Work Plan for Kittitas County and is responsible for completing 2- and 5-year reports. Roles and responsibilities within the KCCD are outlined in Sections 4.2.3.1 through 4.2.3.3.

4.2.3.1 VSP Coordinator

The VSP Coordinator is the KCCD District Manager and is responsible for ensuring all deliverable and timelines are met. The VSP Coordinator manages the program, oversees the KCCD technical staff, and coordinates with County financial staff for budget implementation.

4.2.3.2 VSP Staff

VSP staff at KCCD include a GIS specialist, two conservation planners, and a resource technician, along with financial/administrative staff. VSP staff assist with conducting Watershed Group meetings, attending outreach events, creating and maintaining outreach materials, planning and implementing projects, monitoring post implementation, gathering data, and compiling reports.

5 Monitoring Questions

The monitoring goals and data objectives have been developed to ask the following series of questions and test the corresponding hypotheses.

5.1 Monitoring Questions

The fundamental monitoring question being asked is whether the County “met the protection and enhancement goals and benchmarks of the work plan” (RCW 36.70A.720). That fundamental question requires a review of each of the individual goals, benchmarks, and metrics identified in the Work Plan. Those have been divided into the following series of questions. All of these questions must be considered relative to baseline conditions as of July 22, 2011, and apply only to portions of the County where non-forestry agricultural activities occur. All questions should be considered at the County level, as well as the individual watershed level. For each monitoring question, a hypothesis is offered that is based on the response triggers or benchmarks in the Work Plan.

5.1.1 *Participation*

- Were levels of active participation by agricultural producers sufficient to achieve the protection of critical area functions and values at a County-wide watershed level?
 - Hypothesis: Yes
- Was sufficient technical assistance to agricultural producers provided?
 - Hypothesis: Yes

5.1.2 *Implementation*

- Is there a net loss in units (acres, square feet, etc.) of the most common conservation practices implemented as voluntary stewardship activities within the County?
 - Hypothesis: No

5.1.3 *Water Quality*

- Are stewardship practices protecting and/or enhancing water quality function relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.4 *Hydrology*

- Are stewardship practices protecting and/or enhancing hydrology function relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.5 *Soil Function*

- Are stewardship practices protecting and/or enhancing soil function relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.6 *Habitat*

- Are stewardship practices protecting and/or enhancing soil function relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.7 *Wetlands*

- Are stewardship practices protecting and/or enhancing wetland functions (water quality, hydrology, habitat) relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.8 *Fish and Wildlife Habitat Conservation Areas*

- Are stewardship practices protecting and/or enhancing FWHCAs functions (water quality, hydrology, soil, habitat) relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.9 *Critical Aquifer Recharge Areas*

- Are stewardship practices protecting and/or enhancing CARA functions (water quality and hydrology) relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.10 *Geologically Hazardous Areas*

- Are stewardship practices protecting and/or enhancing GHA functions (water quality, hydrology) relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.11 *Frequently Flooded Areas*

- Are stewardship practices protecting and/or enhancing FFA functions (water quality, hydrology, soil, habitat) relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.1.12 *Agricultural Viability*

- Is VSP protecting and/or enhancing agricultural viability relative to 2011 baseline conditions?
 - Hypothesis: Yes

5.2 **Monitoring Goals**

For the purposes of this monitoring plan, monitoring questions have been expanded to three categories in order to more consistently mirror the text of RCW 36.70A.720(1). These categories are as follows:

- **Participation:** Monitor participation activities and implementation of the voluntary stewardship plans and projects.
- **Implementation:** Monitor stewardship activities undertaken in the VSP area.
- **Effectiveness:** Monitor the effects of the program, and stewardship activities implemented, on critical areas and agriculture relevant to the benchmarks in the Work Plan.

6 Monitoring Data and Data Quality Objectives

6.1 Data Summary

Data will be described in more detail in participation, implementation, and effectiveness monitoring sections of the monitoring plan. Some data are used for multiple monitoring activities. For a quick summary of data used in KCCD VSP monitoring and associated monitoring themes, see Table 3.

Table 3
Data Source Summary

Data	Participation	Implementation	Effectiveness
NRCS Conservation Practice Data	●	●	●
Kittitas County VSP Online Map and Survey	●	○	
KCCD Conservation Practice Data	○	○	
KCCD Records of Voluntary Stewardship Outreach and Technical Assistance	●		
Kittitas County Water Purveyor Water Quality Data			●
Ecology 303(d) list Water Quality Data			○
Stream Flow Gauge Data (multiple agencies)			●
Yakama Nation PIT Array Data			●
WDFW PIT, Electroshock, and Redd Survey Data			○
WDFW HRCD			●
Washington Shrubsteppe Restoration Initiative Maps			●
WDFW Priority Habitat Species			○
USDA Census of Agriculture			●
WSDA Agricultural Land Use Data			●
WDFW PHS Data			○

Notes:

●: Primary Dataset

○: Ancillary Dataset

Primary Dataset: These data will be used to determine whether the Work Plan goals and benchmarks have been met.

Ancillary Dataset: These data can be used to validate or confirm the determinations made using primary data when questions of accuracy, precision, bias, or reliability of the primary data exist.

6.2 Monitoring Data Quality Objectives

Data sources will be evaluated according to data quality objectives as described in the SCC Monitoring Guidelines. These evaluations are summarized for each primary dataset described in the following list. Not all data quality objectives are applicable to each dataset, but each dataset has been evaluated using the following data quality objectives, as quoted verbatim from the SCC Monitoring Guidelines (SCC 2023):

- **Accuracy:** Accuracy refers to how well the analysis, monitoring approach, or observation reflects the “true” reality that is being measured or assessed.
- **Precision:** Precision relates to how consistently measurements of the same phenomenon are similar to each other.
- **Bias:** Bias refers to errors in monitoring data due to one or more systematic incongruences between project goals and monitoring design.
- **Representativeness:** Data representativeness refers to how well the sample, standard operating procedure, or observation reflects the “real” conditions of the phenomenon being monitored.
- **Comparability:** Data comparability refers to the degree to which data from one sample, observation, or standard operating procedure can be compared to another sample, observation, or standard operating procedure.
- **Completeness:** Data completeness is an assessment of the amount of sampling needed to answer the question in relation to the amount of sampling actually conducted.
- **Measurement Range, Sensitivity, and Detection Limits:** Measurement range refers to the range of reliable measurements that an instrument or sampling approach can make. It is critical that the measurement ranges of monitoring methods used correspond to established VSP monitoring goals (e.g., to be able to detect when a “do-something level” is reached). Data sensitivity refers to the resolution of the assessment, observation, or analysis in relation to the overall goals of monitoring. Data detection limits refer to the minimum or maximum values that can be assessed by a specific monitoring method. Any method chosen for monitoring should have a sufficiently high and/or low detection limit in light of monitoring goals.

7 Participation Monitoring

The intent of participation monitoring is to track the number of landowners enrolled in local voluntary enhancement programs; monitor landowner participation in VSP; and assess whether participation has increased, decreased, or stayed the same since 2011.

According to the SCC Monitoring Guidelines, participation monitoring “is used to track the level of engagement from agricultural producers over time to help evaluate questions about program efficacy, outreach, and marketing” (SCC 2023). In the 5-year report, comments provided by the SCC technical panel and monitoring activities related to participation were a primary focus of what could be improved, including evidence of outreach and education occurring with the County.

Participation monitoring “assesses the level of engagement of agricultural producers with respect to the goals and benchmarks of the County’s VSP work plan. Participation monitoring is required to demonstrate that sufficient numbers of agricultural producers are participating to achieve implementation goals and benchmarks” (SCC 2023).

Monitoring Questions:

- Were levels of active participation by commercial and non-commercial agricultural operators (farmers and ranchers) sufficient to achieve the protection of critical area functions and values at a County-wide watershed level?
- Was sufficient technical assistance to agricultural producers provided?

7.1 Active Participation

Monitoring Question: Were levels of active participation by commercial and non-commercial agricultural operators (farmers and ranchers) sufficient to achieve the protection of critical area functions and values at a County-wide watershed level?

Benchmark Metric: Number of acres reported in key stewardship practices, number of self-assessment checklists submitted

7.1.1 Data Sources

7.1.1.1 Natural Resource Conservation Service Database

Functionality: KCCD has compiled a list of conservation projects that use U.S. Department of Agriculture (USDA) funding. The USDA’s primary private lands conservation agency, Natural Resources Conservation Service (NRCS), provides technical assistance to farmers and other private landowners. NRCS tracks stewardship practices funded through the Environmental Quality Incentives Program (EQIP), a program that provides financial and technical assistance to agricultural producers. The KCCD also collaborates with NRCS to implement Farm Bill programs such as the Regional

Conservation Partnership Program. KCCD tracks Farm Bill program enrollment to assess new producer participation in VSP.

Quality: Only conservation practices funded by the USDA are tracked. The data accurately track payments for the implementation of conservation practices that are field verified to be consistent with USDA program specifications. A variety of units are used to track various conservation practices. As a result, precision in terms of quantity of practices is difficult to interpret.

7.1.1.2 Kittitas County VSP Online Map and Survey

Functionality: The survey includes a questionnaire to track conservation practices being implemented on landowners' farms and the practices associated with critical areas. While the KCCD's records of implemented NRCS practices is more comprehensive and accurate, the survey provides another line of evidence for tracking VSP participation for producers who may be implementing stewardship practices outside of the NRCS program.

Quality: Surveys are an opportunity to capture on-the-ground data, connect with landowners who may be interested in or already implementing voluntary stewardship practices, and demonstrate the County's effort to increase VSP outreach.

7.1.2 *Methodology and Data Analysis*

Tracking Farm Bill Program Sign-Ups: Annual sign-ups to Farm Bill programs such as EQIP or the USDA NRCS Regional Conservation Partnership Program (RCPP) track "beginning farmers" as well as established producers who use NRCS funding to implement conservation practices. This allows monitoring to track participation of new producers.

VSP Online Map and Survey Submittals: Surveys are submitted through the online map and survey. Participation monitoring tracks the number of producers who have reported stewardship practice implementation.

Data Analysis: Monitoring period participation levels are compared against baseline participation levels for each watershed.

7.1.3 *Data Collection and Management*

NRCS data are assessed annually to evaluate participation benchmarks. For reporting purposes, data are collected from the NRCS and integrated into the KCCD Database 6 weeks prior to the 2- and 5-year reporting deadlines (County 2018, p. 76). NRCS data are saved to the *VSP > Original > NRCS* folder. Data are imported into the *VSP Database > NRCS Participation* tab according to database parameters (NRCS program [e.g., RCPP or EQIP], VSP watershed, and enrollment quantity). Monitoring results are calculated in the *NRCS Participation* tab and linked to the *VSP Database > Summary* tab.

7.1.4 *“Do-Something Levels” and Adaptive Management*

“Do-Something Level”: Net decrease in Farm Bill Program (EQIP, RCPP) sign-ups

If “do-something levels” are reached, the KCCD will identify alternatives most appropriate to identified causes of disenrollment. Adaptive management measures include the following: 1) if stewardship practices are not agriculturally viable, determine alternative stewardship practices with similar function and that are agriculturally viable; 2) if incentives associated with key stewardship practices have disappeared, identify alternative funding or alternative practices that are more likely to be self-funded; 3) increase outreach to producers; and 4) identify alternative funding or other incentives.

7.1.5 *Ancillary Data*

KCCD Conservation Practice Data: While USDA-funded NRCS conservation practices are the most comprehensive data source for VSP monitoring, KCCD tracks units of conservation practices implemented through other KCCD programs. If analysis of NRCS data results determine that “do-something levels” have been reached, KCCD conservation practice data will be reviewed to confirm trends of disenrollment and whether non-NRCS stewardship practices achieve participation goals.

7.2 Technical Assistance

Monitoring Question: Was sufficient technical assistance to agricultural producers provided?

Benchmark Metrics: Number of outreach and education events; number of event attendees; number of direct mailings to producers and landowners; website visits; individual technical assistance to producer

7.2.1 *Data Sources*

7.2.1.1 **KCCD Records of Voluntary Stewardship Outreach and Technical Assistance**

Functionality: KCCD keeps record of a variety outreach and education efforts. KCCD sends out an annual newsletter with VSP feature articles and promotion of available financial and technical assistance; conducts stewardship workshops; and maintains a website and social media accounts. Individual assistance to producers is provided, including for the development of individual stewardship plans. The data are collected in the VSP Database and included in monitoring reports.

Quality: The data accurately track KCCD outreach efforts. Only KCCD efforts are tracked. Additional efforts by others are not included. Outreach efforts may not be evenly distributed across VSP watershed due to the locations of outreach opportunities.

7.2.2 *Methodology and Data Analysis*

Tracking Outreach Events and Workshops: The KCCD records presentations made by the VSP Coordinator at various producer meetings annually to promote VSP participation. The KCCD also provides workshops on stewardship practice implementation and tracks attendance at the workshops.

Tracking Direct Mailings to Producer and Landowners: The KCCD sends an annual newsletter with a VSP feature article and promotion of financial and technical assistance. The KCCD also prints postcards mailed/handed out to promote VSP. Monitoring tracks the number of newsletters mailed and number of postcards distributed.

Tracking Website and Social Media: The KCCD records unique website visits, VSP storymap views, VSP specific posts on social media, and audience reached per post.

Tracking Individual Technical Assistance to Producers: The KCCD records completion of individual stewardship plans completed for producers.

7.2.3 *Data Collection and Management*

The KCCD conducts an annual review of outreach and participation efforts. Results data for outreach events and workshop are recorded in the *VSP Database > Technical Assistance and Outreach* tab as they occur. Mailings, website visits, social media posts, and individual stewardship plans are input into the *Technical Assistance and Outreach* annually. Monitoring results are compiled for 2- and 5-year reporting, which are calculated in *Technical Assistance and Outreach* and linked to the *VSP Database > Summary* tab.

7.2.4 *“Do-Something Levels” and Adaptive Management*

Benchmark Metric: Decrease in VSP participation

If participation monitoring determines participation in VSP has decreased, the KCCD will increase outreach to producers. Additional outreach will be targeted on a watershed scale based on participation monitoring results for each watershed.

7.3 **Analysis of Participation**

Answering the monitoring questions in this section will allow VSP staff to assess whether participation goals have been achieved through a “multiple lines of evidence” approach. The approach considers both landowner enrollment in voluntary stewardship practice programs and levels of technical outreach indicators (lines of evidence) of VSP participation.

8 Implementation Monitoring

Implementation of voluntary stewardship practices indicates participation and the effectiveness of the County's VSP. According to the SCC Monitoring Guidelines (2023):

[Implementation monitoring] tracks implementation of stewardship practices (i.e., BMPs) across the landscape within a county and/or watershed, with an emphasis on whether BMPs were installed to proper specifications, when and where BMPs have been implemented, and whether BMPs are being maintained over time. Implementation monitoring is required to demonstrate the amount (i.e., acreage, linear feet) and type (i.e., nutrient management, habitat management, conservation tillage) of conservation practices that are occurring throughout a watershed.

Implementation monitoring tracks units (acres, linear feet, and structures) of agricultural stewardship practices occurring in agricultural lands within the County. VSP relies upon voluntary stewardship practices as the primary method of protecting critical areas while preventing cessation of agricultural activities. Implementation monitoring uses conservation practices tracked by NRCS data.

8.1.1 *Stewardship Practice Implementation*

Monitoring Question: Is there a net loss in units (acres, square feet, etc.) of the most common conservation practices implemented as voluntary stewardship activities within the County?

Benchmark Metric: Units of conservation practices implemented

8.1.2 *Data Sources*

8.1.2.1 **National Resource Conservation Practice Database**

Functionality: Conservation projects have been implemented since 2011 baseline year through NRCS-funded programs on agricultural lands. NRCS conservation projects are tracked by codes which provides method for accurately and precisely tracking units of conservation practices implemented.

Quality: NRCS data are considered the most accurate source for monitoring enrollment in their programs. NRCS staff review lease and easement documents and make physical inspections to validate the data. NRCS data are tracked across VSP watersheds and should be able to be organized and reported at a VSP watershed level. The data accurately track payments for the implementation of conservation practices that are field verified to be consistent with USDA program specifications. A variety of units are used to track various conservation practices. As a result, precision in terms of

quantity of practices is difficult to interpret. Conservation practice specifications are rigorous enough to assume projects using the same practice on different sites will perform similarly.

8.1.3 Methodology and Data Analysis

Tracking Units of Voluntary Stewardship Practices: Units will be tracked using data provided by NRCS, and a net loss or gain will be calculated through the following equation: *Change from Baseline Condition = Newly Enrolled Practices – Disenrolled Practices*. The calculation will be completed at a watershed level and County-wide level.

New implementation of conservation practices is necessary to achieve the protection standard because of disenrollment in programs or the abandonment of practices. Practices have an assumed rate and life cycle. Common stewardship practices and their associated “life” as determined by the Watershed Group are listed in Table 4-2 of the Work Plan (County 2018, p. 48).

Stewardship Practice Benefits to Critical Areas: Each NRCS practice is assigned Conservation Practice Physical Effects (CPPE) scores for its positive, negative, or neutral effects on primary critical area functions: soils, hydrology, water quality, and habitat.

8.1.4 Data Collection and Management

Data requests will be sent to NRCS 8 weeks prior to 2- and 5-year report deadlines. Data will be saved to an original folder in the Excel database.

NRCS data will be imported into the Excel database under a *NRCS* tab and organized according to database parameters. Monitoring results will be calculated within the *Summary* tab.

8.1.5 “Do-Something Levels” and Adaptive Management

“Do-Something Level”: The level at which the County must do-something is when there is a decline in the average enrollment of units (acres, linear feet, and structures) of agricultural stewardship practices. If the level is reached, more outreach events would be implemented by the VSP Coordinator.

8.2 Analysis of Implementation

The implementation of NRCS EQIP-funded conservation practices is an excellent indicator of stewardship implementation. All funded projects must meet defined specifications and are inspected by the NRCS. New implementation of conservation practices is assumed to have an overall benefit to critical area functions and values based on the CPPE analysis, but the overall effectiveness of stewardship is monitored separately, as described in Section 9.

9 Effectiveness Monitoring

Effectiveness monitoring evaluates whether voluntary actions by agricultural operators effectively protect and enhance critical areas on lands used for agricultural activities.

Effectiveness monitoring measures the drag of any monitored degradation to key critical area functions (water quality, hydrology, soil function, and habitat) and the lift of stewardship practices on critical area functions. Using a multiple lines of evidence approach, analysis of effectiveness determines whether the “lift” of stewardship practices offsets the “drag” of any degradation that occurred relative to 2011 baseline conditions.

Critical Area Key Functions:

- Are stewardship practices protecting and/or enhancing water quality function relative to 2011 baseline conditions?
- Are stewardship practices protecting and/or enhancing hydrology function relative to 2011 baseline conditions?
- Are stewardship practices protecting and/or enhancing soil function relative to 2011 baseline conditions?
- Are stewardship practices protecting and/or enhancing habitat function relative to 2011 baseline conditions?

Critical Area Protection and Enhancement:

- Are stewardship practices protecting and/or enhancing wetland functions (water quality, hydrology, habitat) relative to 2011 baseline conditions?
- Are stewardship practices protecting and/or enhancing FWHCA functions (water quality, hydrology, soil, habitat) relative to 2011 baseline conditions?
- Are stewardship practices protecting and/or enhancing CARA functions (water quality and hydrology) relative to 2011 baseline conditions?
- Are stewardship practices protecting and/or enhancing GHA functions (water quality, hydrology) relative to 2011 baseline conditions?

Agricultural Viability:

- Is VSP protecting and/or enhancing agricultural viability relative to 2011 baseline conditions?

9.1 Water Quality

Monitoring Question: Are stewardship practices protecting and/or enhancing water quality function relative to 2011 baseline conditions?

Benchmark Metrics: Turbidity, and organochlorine pesticide Total Maximum Daily Load (TMDL)

9.1.1 *Data Source*

9.1.1.1 **Kittitas County Water Purveyors Water Quality Sampling**

Functionality: Kittitas County Water Purveyors (KCWP) conducts water quality sampling at established locations on streams, canals, and other waterways during irrigation season (April through October). The data are collected to determine irrigation effects on total suspended solids.

Quality: The KCWP Water Quality Laboratory was established in 2003, with ongoing accreditation through Ecology ever since. The data are focused on areas with irrigation and does not represent the WRIA 40 (Alkali-Squilchuck watershed). The data are reported at 1.0 nephelometric turbidity unit (NTU) or less precision.

9.1.2 *Methodology and Data Analysis*

Collection: Water quality data collection is focused on compliance with the Upper Yakima River basin suspended sediment, turbidity, and organochlorine pesticide TMDL. KCWP partners with agencies to complete the sampling of 25 sites. Sampling is conducted weekly established locations.

Targets: Per the TMDL, the loading capacity for the mainstem Yakima River requires meeting a turbidity target of 5 NTU over background at Umtanum (Yakima river mile 140.4) when using a site at Nelson Siding (river mile 191) as background.

Stewardship Practice Implementation Targeting: KCWP data are used to target implementation of stewardship practices through ranking criteria for financial assistance programs. For example, two of the ranking criteria for irrigation efficiency upgrades include points for applications that involve land where the tailwater returns directly to a creek or canal and points for projects where more than 50% of the project area is 2% slope or greater. Both criteria are a direct result of efforts to address this TMDL by improving irrigation system efficiency and reducing the movement of soil into waterways through conversions to sprinkler systems.

Data Analysis: NTU are reviewed for TMDL compliance annually by the Watershed Group.

9.1.3 *Data Collection and Management*

The data are downloaded from the KCWP database 6 weeks prior to the 5-year monitoring deadline. Data are saved to the *VSP > Original* folder. Data are then imported into the *VSP Database > Water Quality* tab according to database parameters. Monitoring results are calculated within *Water Quality* and linked to the *VSP Database > Summary* tab.

9.1.4 “Do-Something Levels” and Adaptive Management

“Do-Something Level”: Trends in available data indicating a decrease from baseline water quality data due to agriculture

If the “do-something level” is reached during the 5-year monitoring report assessment, the KCCD’s first step is to determine whether water quality parameters are from agriculture or non-agriculture contributors. If agricultural contributors are confirmed, the KCCD will send a survey with outreach to agricultural producer owners along the affected watercourse, waterbody, and/or CARA to determine the percentage of participation and stewardship. The Watershed Group will identify stewardship strategies that support water quality function to meet the target for implementation.

9.1.5 Ancillary Data

Department of Ecology 303(d) List: The 303(d) list is a list of waters, created by Ecology, that are not attaining water quality standards and are not expected to meet standards even after best management practices (BMPs) have been implemented. TMDL is reported for all waters on the 303(d) list. The same tests are done in each waterbody. The data change from year to year due to a variety of factors. Because there has been a lack of data in recent years, these data should only be used to supplement or confirm findings from KCWP. These data are not collected as frequently as the KCWP data. They are therefore less useful in determining agricultural effects on water quality.

9.2 Hydrology

Monitoring Question: Are stewardship practices protecting and/or enhancing hydrology function relative to 2011 baseline conditions?

Benchmark Metric: Stream flow cubic feet per second (cfs)

9.2.1 Data Source

9.2.1.1 Stream Flow Monitoring (U.S. Geological Survey, Ecology, U.S. Bureau of Land Reclamation, Kittitas Reclamation District, and KCCD)

Functionality: Data from multiple agencies enable continuous monitoring of discharge at various stream flow gauge locations on the Yakima River and its tributaries. These data are used to target implementation of stewardship practices to improve on-farm drought resiliency and instream flow conditions for fish and habitat.

Quality: Although the flow gauges do not accurately represent all the seasonal flows in Kittitas County, there are enough data to make watershed-wide inferences on hydrology to assess “do-something level.” The data are helpful to understand the impacts that nearby agricultural activities have on water availability. The gauge system is used for water management decision

making and is well suited to understanding the effects of agriculture practices on flow as well as flow on agricultural viability.

9.3 Soil Function

Monitoring Question: Are stewardship practices protecting and/or enhancing soil function relative to 2011 baseline conditions?

Benchmark Metric: Soil fertility

9.3.1 *Data Source*

The data source identified in the Work Plan and used in previous monitoring efforts, the National Resource Inventory, has stopped collecting data annually, with the last data collection year being in 2017.

9.3.2 *“Do-Something Levels” and Adaptive Management*

Currently, the SCC is working with the WSDA technical panel representative to produce a dataset that will assist counties in monitoring soil function at a VSP watershed level. The KCCD will incorporate this dataset into its monitoring efforts as these data become available. The County will continue to monitor the three other primary functions to monitor (fill in with critical areas whose functions are tied to soil function) goals. Soil function is used to monitor FWHCAs, GHAs, and FFAs. While the KCCD will work to develop a monitoring method to measure benchmarks more accurately and precisely, these critical areas are also monitored through water quality, hydrology, and habitat function monitoring activities. Soil function is also protected by ongoing stewardship practices.

9.4 Habitat

Monitoring Question: Are stewardship practices protecting and/or enhancing habit function relative to 2011 baseline conditions?

Benchmark Metrics: Change in habitat indicators (fish activity; shrubsteppe habitat; wetland and wetland buffer habitat; tree canopy loss; impervious/pervious surface change)

9.4.1 *Data Sources*

9.4.1.1 **Passive Integrative Transponder Arrays Database**

Functionality: The KCCD worked with Yakama Nation to install passive integrated transponder (PIT) arrays in key tributaries (Manastash, Wilson, and Cherry) to the Yakima River, filling in gaps in the existing PIT array locations. PIT arrays are maintained in Manastash Creek, Taneum Creek, Teanaway River, Big Creek, Little Creek, and Tucker Creek, as well as the Yakama Nation Acclimation sites and Roza Dam. The data collected are being used as an indicator of the impacts of various project

implementation along with efforts by the KRD to supplement flows in these tributaries. The data are used to see seasonal trends of fish activity.

Quality: The only fish that are tracked are the ones tagged, so the data are not representative of all fish activity. However, they provide an indicator of fish activity in key tributaries. The data are limited to the short distance that the antennas can reach and are influenced by stream factors. For more completeness, more PIT arrays can be implemented throughout the County.

9.4.1.2 WDFW Shrubsteppe Restoration and Resiliency Initiative Database

Functionality: The data are a tool to understand agricultural impacts on shrubsteppe habitat.

Quality: WDFW created the Washington Shrubsteppe Restoration and Resiliency Initiative (WSRRI) maps with multiple variables to create an accurate representation of the habitat. Application of the same categories for each VSP watershed creates a precise and consistent monitoring approach. The data use multiple variables to represent the aspects of shrubsteppe habitat. The resolution of WSRRI data allows assessment of “do-something levels” specific to shrubsteppe habitat.

9.4.1.3 WDFW High-Resolution Change Detection

Functionality: The WDFW’s High-Resolution Change Detection (HRCD) is intended to monitor and assess trends in land cover over time. These data are used to monitor loss of tree canopy and new impervious/semi-pervious surfaces. These data will be used to compare landcover in 2011 to current landcover within priority habitats, wetlands, wetland buffers, and riparian management zones.

Quality: High-resolution imagery is preferable because different land covers cannot be delineated at 30-meter pixels. Due to the update in technology and gathering of data, changes in the land cover could not be from “on-the-ground” changes but rather from changes found in the pixels. The detection in land-cover change can be large enough to correspond to whether goals are met or not. For change polygons that experience less than 100% change, there is some spatial uncertainty as to where the change occurs within the polygon. HRCD data do not show tree canopy growth over time—only loss.

9.4.2 *Methodology and Data Analysis*

Multiple Lines of Evidence Approach: As habitat is a broad function that concerns habitat specific to different species, multiple data sources are used to evaluate the different benchmark indicators.

Tracking Change in Fish Population: Fish counts from PIT arrays indicate overall usage in the tributaries of the Yakima River where the majority of the agricultural practice intersections occur with fish habitat. Overall numbers recorded at Roza Dam reflect abundance in the entire Upper Yakima Watershed.

Tracking Shrubsteppe Change: For VSP monitoring, the WSRRI data are narrowed down to County VSP intersect areas. Sites with land cover classification changes indicating a downgrade or loss of shrubsteppe and the monitoring period are evaluated and further investigated using WDFW HRDC data.

Tracking Wetland and Wetland Buffer Change: For VSP monitoring, the Ecology Wetland Changes Analysis dataset is narrowed down to County VSP intersect areas. Sites with land cover classification changes indicating a wetland loss or downgrade between 2011 and the monitoring period are evaluated and further investigated using WDFW HRCD data. Due to a statistically high number of irrigated lands that are incorrectly identified as wetlands, a percent change approach is applied to investigation of change. The number of sites identified with change will drive investigations. VSP staff will investigate sites up to the point where statistically significant monitoring results can be obtained.

Tracking Canopy Loss and Impervious/Semi-Pervious Surfaces: For VSP monitoring, the WDFW HRCD dataset is narrowed down to County VSP intersect areas. Sites with land cover classification changes indicating tree canopy loss and/or impervious/semi-pervious surface increase between 2011 and the monitoring period are evaluated and further investigated further using WDFW HRCD data.

Watershed Analysis: Evaluating monitoring results on a watershed scale will assist the KCCD and Watershed Group in targeting adaptive management strategies to address confirmed instances habitat function degradation due to agricultural activities at a watershed level.

9.4.3 *Data Collection and Management*

Data are collected from partners 6 weeks prior to the 5-year monitoring report deadline. Data are saved to the *VSP > Original folder*. Data are imported to the VSP Database according to database parameters. Each habitat function indicator has its own section in the VSP Database. Monitoring results are calculated within respective habitat function indicator function tabs and linked to the *VSP Database > Summary* tab.

9.4.4 *“Do-Something Levels” and Adaptive Management*

“Do-Something Levels”: Loss of fish presence and abundance; loss of shrubsteppe habitat, loss of wetland/wetland buffers, loss of tree canopy; increase in impervious/semi-pervious surfaces

Fish Activity Adaptive Management: If changes in fish presence and abundance are detected, causes for the downturn will be identified. For example, the most recent downturn in adult abundance is thought to be driven primarily by marine environmental conditions and a decline in ocean productivity (County 2021). Data are used to inform screening and ranking criteria for projects funded through financial assistance programs. It is also used to inform priorities for future work and to support grant funding requests for additional financial assistance to continue work toward population recovery particularly for listed species.

Shrubsteppe Change Adaptive Management: If changes in shrubsteppe habitat are detected, whether changes are due to agricultural activity will be investigated. If agricultural causes are identified, the KCCD will conduct outreach to producers adjacent to or intersecting with shrubsteppe habitat areas. The work group will evaluate stewardship strategies that promote shrubsteppe habitat function and identify priorities for implementation.

Wetlands and Wetland Buffers Adaptive Management: Irrigation induced wetland make up a significant portion of mapped wetlands in remote-sensing databases, such as the National Wetlands Inventory (used in past monitoring) and the Ecology Wetland Change Analysis (proposed for future monitoring). Extrapolating instances where irrigated lands were incorrectly identified as wetlands out to the thousands and thousands of acres of mapped wetlands is a clear demonstration that the time and funding commitment to verify and monitor even a small percentage of the wetlands in the County is beyond the current capacity of the VSP. Where wetlands are suspected (whether they are mapped or not), BMPs are encouraged in the available programs, particularly those wetlands that are associated with riparian and floodplain habitat on streams and rivers in Kittitas County.

Tree Canopy Loss and Impervious/Semi-Pervious Surface Adaptive Management: If tree canopy loss is detected and determined to be due to agricultural activity, the KCCD will initiate a survey with outreach to agricultural producers and/or property owners in affected watershed to determine percentage of participation in stewardship. Enrollment in stewardship practices will be evaluated to determine if they are consistent with stewardship practices identified to meet FWHCA VSP objectives.

9.4.5 Ancillary Data

Additional Fish Count Surveys: In addition to the PIT array data, WDFW and partners do some electroshock surveys, redd counts, and other data collection for various reasons. As part of the Yakima Tributary Access and Habitat Program (KCCD is a core team member along with WDFW), these surveys are often done pre- and post-construction for fish passage projects. While these data are limited in their usage for statistical analysis of populations, they are helpful as presence/absence indicators that confirm success of barrier removal projects. Electroshock surveys also occur during fish rescues for construction of various projects. Redd surveys help to indicate where spawning is occurring. In 2019 and 2020, coho salmon redd counts indicate that a significant level of spawning is occurring in the lower Wilson/Naneum/Cherry Creek watershed. Coho salmon were extirpated and have been reintroduced. Supplementation work by the Yakama Nation will result in increasing numbers of coho salmon, so understanding what reaches they are using helps to inform future projects.

WDFW PHS Data: WDFW PHS Data are reviewed when individual stewardship plans are created to provide producers with information about habitats and species associated with their properties and

promote their consideration in selection of stewardship practices. The mapping resolution is too broad for site-specific change detection, but the data are helpful for trend information.

9.5 Effectiveness of Stewardship Practices

Monitoring Question: Are implemented stewardship practices protecting and/or enhancing critical area functions? (See Sections 9.5.2.1 to 9.5.2.5 for monitoring questions for each critical area.)

Benchmark Metrics: Units of managed strategies that promote critical area functions (See Sections 9.5.2.1 to 9.5.2.5 for benchmark metrics for each critical area.)

9.5.1 Data Source

9.5.1.1 Natural Resource Conservation Service Data

Functionality: NRCS conservation practices are tracked with codes and associated CPPE scores that provide a numerical evaluation of the effects of the practices for different resource concerns. This provides a method for evaluating the high-level effects of implemented stewardship practices on key critical area functions. Strategic stewardship practices were selected to support the accomplishment of objectives and goals for each VSP critical area.

Quality: See Section 8.1.1.

9.5.2 Methodology and Data Analysis

Connecting Stewardship Practices with Specific Benchmark Metrics: Each VSP goal has benchmark objectives designed to achieve protection and/or enhancement of critical area functions through the implementation of targeted stewardship practices. Each benchmark objective is connected to measurable NRCS stewardship practices that promote key critical area functions (water quality, hydrology, soil function, and habitat).

CPPE Scores: In the Work Plan, CPPE scores for water quality, hydrology, soil function, and habitat were averaged for each stewardship practice. CPPE scores provide a quantitative score detailing the magnitude of the practice’s effect on key critical area functions.

9.5.2.1 Wetlands

Monitoring Question: Did implemented stewardship practices protect and enhance wetland functions (water quality, hydrology, and habitat)?

Benchmark Metrics	NRCS Conservation Practice
Strategies that provide direct protections to wetlands and wetland buffers.	Riparian Herbaceous Cover/Filter Strips
	Fencing
	Heavy-Use Area Protection

Benchmark Metrics	NRCS Conservation Practice
	Streambank Crossing
	Wetland Enhancement/Restoration
Strategies that promote water quality and hydrology functions by reducing erosion and improving water storage and filtration.	Range Planting
	Managed Grazing
	Streambank and Shoreline Protection
Strategies that promote water quality and aquatic habitat functions by reducing inputs from runoff.	Irrigation Water Management
	Sprinkler Systems
	Nutrient Management
	Riparian Herbaceous Cover/Filter Strips

Note:

CPPE scores for each NRCS conservation practice are included in Table 5-6 in the Work Plan.

9.5.2.2 Fish and Wildlife Habitat Conservation Areas

Monitoring Question: Did stewardship practices protect and enhance FWHCA functions (water quality, hydrology, soil, and habitat)?

Benchmark Metrics	NRCS Conservation Practice
Strategies that promote habitat functions by restoring or creating new habitat structures.	Stream Habitat and Improvement Management
	Streambank and Shoreline Protection
	Riparian Herbaceous Cover
	Habitat Restoration
	Tree/Shrub Establishment
Strategies that promote habitat functions by limiting trampling of habitat.	Managed Grazing
	Watering Facilities
	Access Control
Strategies that promote water availability for aquatic species and agricultural benefits.	Irrigation Water Management
	Irrigation Pipeline
	Sprinkler Systems
	Trust Water
	Conservation Easement
Strategies that protect fish-bearing streams, limit shoreline and watercourse degradation, and enhance shoreline areas and watercourses.	Stream Habitat Improvement and Management
	Streambank and Shoreline Protection
	Channel Bed Stabilization
	Aquatic Organism Passage
	Tree/Shrub Establishment
	Riparian Herbaceous Cover
	Watering Facility

Benchmark Metrics	NRCS Conservation Practice
	Structure for Water Control
	Managed Grazing
Strategies that promote water quality and aquatic habitat functions by reducing inputs from runoff (surface water quality).	Irrigation Water Management
	Irrigation Pipeline
	Sprinkler Systems
	Nutrient Management
	Pest Management
	Riparian Herbaceous Cover/Filter Strips
Strategies that protect and/or enhance perennial grass vegetation in shrubsteppe areas.	Managed Grazing
	Upland Wildlife Habitat Management
	Tree/Shrub Establishment
	Watering Facilities
	Range Planting

Note:

CPPE scores for each NRCS conservation practice are included in Table 5-6 in the Work Plan.

9.5.2.3 Critical Aquifer Recharge Area

Monitoring Question: Did stewardship practices protect and enhance CARA functions (water quality and hydrology)?

Benchmark Metrics	NRCS Conservation Practice
Strategies that protect and/or enhance shallow groundwater wells by managing chemical and nutrient input controls.	Irrigation Water Management
	Sprinkler Systems
	Nutrient Management
	Pest Management
Strategies that protect and/or enhance natural groundwater filtration functions.	Tree/Shrub Establishment
	Range Planting
	Managed Grazing
Strategies that protect and/or enhance hydrology functions by improving water conservation.	Irrigation Water Management
	Sprinkler Systems
	Pipelines

Note:

CPPE scores for each NRCS conservation practice are included in Table 5-6 in the Work Plan.

9.5.2.4 Geologically Hazardous Areas

Monitoring Question: Did stewardship practices protect and enhance GHA functions (water quality and hydrology)?

Benchmark Metrics	NRCS Conservation Practice
Strategies that protect and/or enhance water quality, hydrology, soil, and habitat functions by reducing erosion and improving water storage and filtration.	Range Planting
	Managed Grazing
	Sprinkler Systems
	Pipelines
	Riparian Planting

Note:

CPPE scores for each NRCS conservation practice are included in Table 5-6 in the Work Plan.

9.5.2.5 Frequently Flooded Areas

Monitoring Question: Did stewardship practices protect and enhance FFA functions (water quality, hydrology, soil, and habitat)?

Benchmark Metrics	NRCS Conservation Practice
Strategies and/or enhance FFAs directly.	Riparian Herbaceous Cover
	Riparian Forest Buffer
	Tree and Shrub Planting
	Fencing
	Heavy-Use Protection
	Floodplain Restoration
Strategies that protect and/or enhance water quality, hydrology, soil function, and habitat using techniques that limit soil compaction or trampling of habitat.	Managed Grazing
	Watering Facilities
	Fencing
Strategies that promote water quality, hydrology, soil, and habitat functions by reducing erosion and improving water storage filtration.	Range Planting
	Managed Grazing
	Sprinkler Systems
	Residue Management, No-Till/Strip Till Direct Seed
	Conservation Cover

Note:

CPPE scores for each NRCS conservation practice are included in Table 5-6 in the Work Plan.

Measuring Historical Enrollment Data: To establish a 2011 baseline condition, historical NRCS enrollment data were measured to develop an average annual enrollment quantity for each practice.

Calculating Change from Baseline Conditions: This is the final step in determining the effect that conservation practices have on critical areas functions and values. This is completed by converting the quantity of conservation practices (based on CPPE scores) to a functions score. This acts to normalize the data and account for the differing amount of benefit provided by different practices. Change from baselines conditions is calculated using the following method:

Change from Baseline Condition = (Newly Enrolled Practices x Physical Effects Scores) – (Disenrolled Practices x Physical Effects Score)

Watershed Analysis: CPPE functions scores for each stewardship practice are calculated on a watershed scale. To accurately target adaptive management efforts, whether each benchmark objective is being accomplished through implementation of stewardship practices should be evaluated for each watershed.

Verification: In addition to the quality control implemented by the NRCS, the KCCD annually verifies 10% of the implemented practices through monitoring and visual recognition (County 2018, p. 77).

9.5.3 *Data Collection and Management*

Data are collected annually to assess “do-something levels.” Monitoring results for the 5-year report are calculated 4 weeks prior to reporting report deadline. Data are collected from the NRCS and saved to the *VSP > Original > NRCS* folder. Data are linked from *VSP Database > NRCS Implementation* tab (see Section 8.1.3) to the *VSP Database > NRCS Effectiveness* tab according to database parameters (critical area goal, benchmark objectives, stewardship practices for each objective, NRCS code, stewardship practice units per watershed, CPPE scores, and CPPE function score per watershed). Monitoring results are calculated in the *NRCS Effectiveness* tab and linked to the *VSP Database > Summary* tab.

9.5.4 *“Do-Something Levels” and Adaptive Management*

“Do-Something Level”: 120% of Protection Metrics (assessed annually)

In other words, are there 1.2 times as many new practices implemented than older practices are abandoned in any given year? The KCCD leads assessment of whether trigger levels are reached and implementing adaptive management. If the “do-something level” is reached, the KCCD will initiate outreach with producers and review approach.

1.6 **Agricultural Viability**

Monitoring Question: Is the VSP protecting and/or enhancing agricultural viability relative to 2011 baseline conditions?

Benchmark Metrics: Number of farms, acreage engaged in agricultural activities, average farm acreage, gross farm income

9.5.5 *Data Sources*

9.5.5.1 **USDA Census of Agriculture**

Functionality: The Census of Agriculture is a complete count of U.S. farms and ranches and the people who operate them. Even small plots of land—whether rural or urban—count if \$1,000 or more of such products were raised and sold, or normally would have been sold, during the census year. Several key statistics are excellent indicators of agricultural viability on the County scale. Agricultural census data provide valuable insights into demographics, economics, land use, and activities on U.S. farms and ranches on a County level (WSDA 2024).

Data Quality: Data are provided every 5 years and summarize key statistics that characterize the profile of agriculture in the County. Because the data are only provided every 5 years, they are only appropriate for 5-year reporting. The data are not available at the watershed resolution.

Several key statistics are excellent indicators of agricultural viability on the County scale. The data are not available at the watershed resolution.

9.5.6 *Methodology and Data Analysis*

Agricultural Viability Indicators: Agricultural viability is measured using four indicators that will provide a high-level assessment of agricultural operators' ability to productively farm on a given piece of land or in a specific area: number of farms, acreage engaged in agricultural activities, average farm acreage, and gross farm income.

Data Analysis: The VSP Database is designed to provide a percent change calculation of each indicator between baseline year and monitoring year.

9.5.7 *Data Collection and Management*

Queries for agricultural indicators can be performed using the USDA National Agricultural Statistics Service, Census of Agriculture *Quik Stats 2.0* tool. The results for each query (number of farms, acreage engaged in agricultural activities, average farm acreage, and gross farm income) are input in the *VSP Database > Ag Viability* tab according to database parameters. Monitoring results are calculated in the *Ag Viability* tab and linked to the *VSP Database > Summary* tab.

9.5.8 *"Do-Something Levels" and Adaptive Management*

If the data show a decreasing trend in agricultural viability indicators, analysis will be conducted to confirm causes and whether this was due to critical area regulation or other causes, such as larger

economic trends. If the data show a decrease in the acreage of land in production, these data will be compared to parcel-level land use data to determine whether the cause is related to conversion to other land use, conversion to restored habitat, or other causes.

9.5.9 Ancillary Data

WSDA Agricultural Land Use Data: WSDA maintains an agricultural land use geodatabase that assesses agricultural production in Washington. The land use data are obtained through windshield surveys, producers, aerial and satellite imagery, the USDA National Agriculture Statistics Services Cropland Data Layer, and other sources to identify agricultural land use (WSDA 2024). WSDA also tracks land that has been taken out of agricultural production. WSDA crop data are classified by general crop group, crop types, and irrigation method. WSDA data quality standards should meet VSP data quality objectives. Data are available for download through the WSDA website. Data will need to be filtered by VSP areas. Data are not collected annually for the entire state.

9.6 Analysis of Effectiveness

Measuring the effectiveness of the VSP program is extremely challenging. Impacts to critical area functions and values are occurring constantly due to global climate effects, non-agricultural development, and forestry and other natural resource management practices. By using multiple sources of indicators of the key critical area functions and values, and filtering data to sources in and adjacent to agriculture-critical area intersects, the effects of stewardship are expected to be measurable. The crosswalk analysis of critical area goals and objectives with key functions monitoring results will determine whether degradation of key functions results in the degradation of critical areas, or whether implementation of stewardship practices that promote key functions results in the protection and/or enhancement of critical areas. By combining this evidence of effectiveness with evidence of participation and implementation of stewardship activities, the overall effectiveness of the VSP in protecting and enhancing critical area functions and values can be shown.

10 Quality Assurance and Quality Control Protocols

10.1 Quality Assurance

Data Quality:

- Proposed data sources will be evaluated by VSP staff using VSP data quality objectives.
- New data sources not included in this monitoring plan must be approved by the VSP Coordinator.

Data Management:

- VSP staff will receive database Standard Operation Procedure (SOP) training before use of database.
- VSP staff will implement data collection schedule as described in the monitoring plan.

Data Analysis:

- VSP staff will receive training in data analysis SOPs.
- VSP staff will follow monitoring activity SOPs as described in the monitoring plan.
- Data analysis of each monitoring activity's results will be reviewed by VSP Coordinator or other qualified County staff.
- Participation, implementation, and effectiveness monitoring results will be reviewed by VSP Coordinator or other qualified County staff.

Field Verification:

- VSP staff will receive training in field verification SOPs and skills necessary for each field verification method.
- VSP staff will follow field verification SOPs as described in the monitoring plan.
- During field verification events, staff will conduct a calibration test to compare the range of data results, such as habitat quality evaluations.

Reporting:

- The VSP Database will be updated and maintained quarterly according to monitoring activity protocol.
- 2- and 5-year monitoring report drafts will be completed 4 weeks before submittal to the SCC.
- 2- and 5-year monitoring report drafts will be reviewed by the watershed work group 2 weeks before submittal to the SCC.

10.2 Quality Control

See previous sections for quality assurance protocol specific to each monitoring activity.

Data Quality:

- Assessment of existing data sources against VSP data quality objectives by VSP staff during 5-year monitoring period

Data Management:

- Verification of VSP staff SOP implementation by VSP Coordinator
- Approval of any structural changes to database by VSP Coordinator
- Biennial review of SOPs, as written in VSP Database, by VSP Coordinator

Data Analysis:

- 2- and 5-year monitoring database calculations review
- Review of monitoring results for replicability
- Review database links and linked calculations used to compute monitoring results
- Verification of data results against VSP goals and benchmarks

Field Verification:

- Field verification of representative sample of remote-sensing data by County staff during 5-year monitoring period
- Field verification of representative sample of VSP-funded voluntary agricultural stewardship practices

Reporting:

- Review consistency of 2- and 5-year monitoring plan report with Work Plan
- Review consistency of 2- and 5-year monitoring activities with VSP monitoring plan
- Review of monitoring results by the Watershed Group
- Review of monitoring results by VSP Coordinator

10.3 Adaptive Management

“Ongoing adaptive management is needed to align monitoring activities, plans, data, and reporting” (SCC 2023). The County will use adaptive management of the monitoring plan to identify monitoring plan goals that are not being met and provide actions that would meet them. The monitoring plan is a living document updated as necessary as part of VSP adaptive management.

11 Reporting

11.1 2-Year Report to SCC Approach

The statute requires the Watershed Group to complete a biennial report:

(l) Conduct periodic evaluations, institute adaptive management, and provide a written report of the status of plan and accomplishments to the county and to the [Conservation Commission] within sixty days at the end of each biennium. (RCW 36.70A.720)

The County VSP Database is organized with the goal of creating consistent, accurate, and accessible 2-year monitoring reports. The database has been designed to conform to the Work Plan, this monitoring plan, and previous 2-year monitoring reports.

11.2 5-Year Report to SCC Approach Full Data and Analysis Submittal

The statute requires comprehensive program reviews at least every 5 years:

(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 [of the Conservation Commission] and the county on whether it has met the work plan's protection and enhancement goals and benchmarks.

(2)(l)(i) Not later than ten years after receipt of funding for a participating watershed, the watershed group must report to the direct [of the Conservation Commission] and the county on whether it has met the work plan's protection and enhancement goals and benchmarks. (RCW 36.70.720)

2-year reports are developed by KCCD under the direction of the work group. The reports include a program evaluation and a written report of the Work Plan's status, including accomplishments.

5-year reports are developed by KCCD under the direction of the work group. The 5-year report provides a detailed evaluation of monitoring results and the status of Work Plan performance in meeting goals and benchmarks.

The database is organized with the goal of creating consistent, accurate, and accessible 5-year monitoring reports. The database has been organized to conform to the Work Plan, this monitoring plan, and the SCC template used for 5-year monitoring in 2021.

11.3 2- and 5-Year Reporting Approach as a Narrative for Work Group

The 2-year status report provides the KCCD and the Watershed Work Group with a forum for updating the public on the VSP implementation progress made during each biennium. These status reports should provide a snapshot of what has been done during each 2-year period and should answer the following questions:

- How far along are we with our planned implementation? (status of plans)
- What have we done? (accomplishments)

The Work Group and KCCD must report to the director of the SCC on whether it has met the Work Plan's protection and enhancement goals and benchmarks every 5 years. If the Work Group determines that the protection goals and benchmarks have been met, and the director of the Conservation Commission concurs under RCW 36.70A.730, the Work Group shall continue to implement the Work Plan. However, if the Work Group determines the protection goals and benchmarks have not been met, the watershed is subject to RCW 36.70A.735. If the Work Group determines the enhancement goals and benchmarks have not been met, the Work Group must determine what additional voluntary actions are needed to meet the benchmarks, identify the funding necessary to implement these actions, and implement these actions when funding is provided.

The format and contents of the 5-year monitoring report and guidance provided by the SCC are intended to facilitate the review and concurrence of the director. The report is reviewed and evaluated by the SCC, in conjunction with the Technical Panel and the Statewide Advisory Committee. The Work Group uses the 5-year review and evaluation report to assert that they are (or are not) meeting their VSP Work Plan goals and benchmarks. The SCC, as part of its review, determines through an analysis of the 5-year review and evaluation report whether it concurs with the assertion of the work group. As a result, the 5-year review and evaluation report must include specific information related to the County's Work Plan goals and benchmarks, as well as monitoring and adaptive management plans.

12 References

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