San Juan County
Voluntary Stewardship Program
Monitoring Plan

by San Juan Islands Conservation District,
on behalf of the San Juan County VSP Work Group

June 20, 2024

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BACKGROUND

San Juan County is one of 27 counties in Washington State that has opted to participate in the Voluntary Stewardship Program (VSP). San Juan County elected officials initiated conversations about VSP in 2012, funding to implement the VSP in San Juan County became available in 2015, and the County initiated the process to establish a Watershed Work Group (Work Group) to develop a Work Plan in compliance with the VSP statute. This Work Plan was established in 2018 and describes the county's road map to compliance with the VSP statute—it specifies the purpose, goals, and objectives for enhancing agricultural viability while protecting and enhancing critical areas within the county.

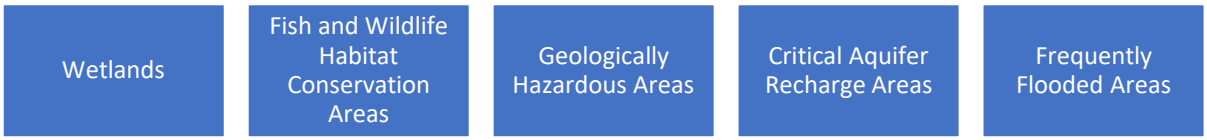

Figure 1: Critical Areas, as defined by the Growth Management Act

In 2020, the Work Group completed its first Five-Year Report, assessing progress toward meeting the protection and enhancement goals and benchmarks of the VSP Work Plan. Findings of the report indicated that many protection and enhancement goals were not being met. In 2021, the Work Group responded by developing an Adaptive Management Plan that modified elements of the original 2018 Work Plan in order to create goals and benchmarks that aligned with the county's capacity to report progress over five-year periods. The Work Group will be adaptively managing once again in 2024 in conjunction with the submission of this document.

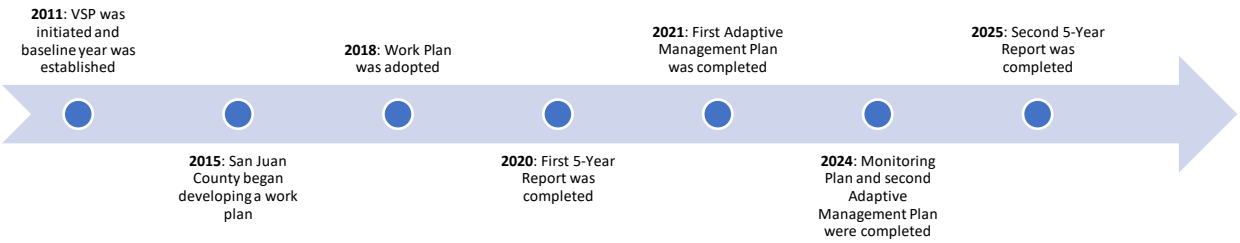

Figure 2: Timeline of First Fifteen Years of VSP

VSP involves all parties at the state, local, tribal, and federal level in both maintaining and enhancing agricultural viability while also protecting critical areas. As part of the program's development through the Growth Management Act in 2011 (RCW 36.70A.700), a county is "required to 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;" "conduct periodic evaluations, institute adaptive management;" and "assist state agencies in their monitoring programs" (RCW 36.70A.720).

PROJECT DESCRIPTION

The purpose of this document is to outline the monitoring plan that will be used to demonstrate if San Juan County is protecting or enhancing each of the five critical areas and agricultural viability, as outlined below, based on the benchmarks and goals as described in the 2018 Work Plan and subsequent 2024 Adaptive Management Plan.

The plan will identify key monitoring questions and hypotheses that inform the development of goals and benchmarks. The plan will also discuss in depth the metrics and tools used to answer these questions, including protocols, schedules, and data quality objectives for each tool.

San Juan Islands Conservation District (SJICD or the District) has served as the technical service provider of the San Juan County VSP since 2017 and is responsible for completing all monitoring and reporting activities.

GEOGRAPHIC CONTEXT

As mentioned above, VSP statute requires counties to monitor conditions and actions taken toward improvement in order to determine whether these actions are protecting or enhancing critical area functions and values *at the watershed scale*.

Washington state is divided into 62 Water Resource Inventory Areas (WRIAs) based on natural watersheds. San Juan County is a unique geographic region composed of over 100 islands, several of which are farmed. The county does not have any major river systems. Given the unique island geographic features of San Juan County, all of the islands form part of a single watershed, WRIA-2, as defined by the Washington Department of Ecology (Washington Department of Ecology, 2023). The United States Geological Survey (USGS) further designates watersheds based on a Hydrologic Unit Map (HUC), a code of classification for the nation's hydrology and drainage based on regions and subregions. HUC 8 is a watershed designation that maps the subbasin level, analogous to medium-sized river basins. USGS has categorized all of San Juan County as a HUC 8 basin, while each of the major islands is broken down into more granular HUC 10 basins (United States Geological Survey, 2024). Finally, San Juan County has further identified sub-basins for each of its streams in order to support the work that the county's Clean Water Advisory Committee conducts with regards to stormwater development.

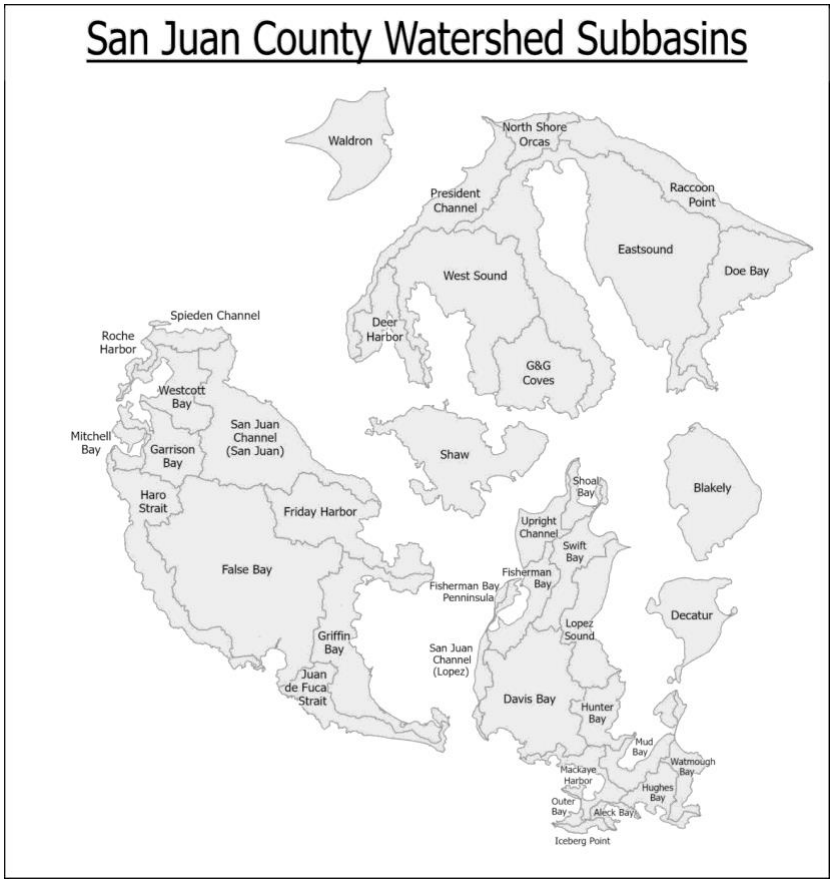

Figure 3: San Juan County Subbasin Watersheds

San Juan County has delineated 35 such subbasins (hereafter, watersheds) on the three largest islands, eight of which are considered priority watersheds demanding greater attention from the VSP due to a high concentration of agriculture and sensitive ecosystems.[1]

The San Juan County VSP Work Group focuses monitoring questions on the entire county watershed level to answer whether or not it is meeting its goals and benchmarks. When appropriate, monitoring results may be aggregated at the sub-basin scale to better identify and focus on target areas that may not be meeting protection and enhancement goals.

MONITORING QUESTIONS

The San Juan County VSP Work Group will use this Monitoring Plan as a framework for monitoring into perpetuity in order to answer the questions:

- Is agriculture positively, negatively, or neutrally impacting natural resources?
- Are conservation practices adequately protecting and enhancing critical areas based on impacts to functions and values?

[1] These eight priority watersheds are described in the 2019 Eight Basin Report as watersheds that recently or currently support salmonids. Hummel Lake on Lopez once featured as a ninth priority watershed but was dropped as a result this study by being the smallest and least likely to respond to salmonid recovery actions.

- Are San Juan County residents actively engaged in practicing voluntary stewardship? Has engagement remained the same, increased, or decreased over time?
- Which target areas need additional technical and financial resources to support the protection and enhancement of critical areas?
- How quickly is change occurring? Is change that negatively impacts critical areas offset by change that positively impacts critical areas, at the county scale?
- Is agriculture in San Juan County viable? Is viability changing over time? What are the ways in which the protection and enhancement of critical areas can also support agricultural viability, and vice versa?

In order to answer these questions, the Work Group has developed goals and benchmarks for each critical area and agricultural viability that serve as targets for tracking and reporting on change over time. These goals and benchmarks were developed by first determining the specific functions and values of each critical area that the county prioritized based on need and ability/capacity to address with the current available resources.

DETERMINING FUNCTIONS AND VALUES

VSP monitoring sets out to protect and enhance the functions and values of each critical area. Functions are understood as "the resulting processes… that result from unique combinations of *composition* and *structure* of ecosystem elements, attributes, or features" (Washignton State Conservation Commission, 2023). Values are understood as the benefits of functions to society, culture, and economies, or "ecosystem services." Values are categorized by four types: provisioning, regulating, cultural, and supporting services.

Wetlands

A wetland is determined by its soil components, water features, and vegetation. A wetland is further defined by San Juan County as "an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (San Juan County VSP Work Group, 2018). Wetland functions can be generally grouped into three broad categories: water quality, hydrology, and habitat. The 2018 VSP Work Plan identified the following functions as local priorities.

WATER QUALITY FUNCTIONS	HABITAT FUNCTIONS
Sediment removal	General habitat (for all habitats and species)
Nutrient removal	Invertebrate habitat
Toxics removal	Amphibian habitat
	Anadromous fish habitat
WATER QUANTITY FUNCTIONS	Resident fish habitat
Peak flow reduction/surface water storage	Bird habitat
Downstream erosion control	Mammal habitat
Groundwater recharge	Native plant richness
Baseflow support	Primary production and organic export

Figure 4: Wetland Functions (Based on Washington Department of Ecology, 1999 and Adapted in the 2018 SJC VSP Work Plan)

These functions were identified to inform benchmarks that would guide management actions and decisions. For example, a wetland buffer that is devoid of trees or shrubs can be enhanced by planting with native species. The functional lift could be measured in several ways: counting the number of stems per acre planted, counting the increase in cover of the vegetation, or counting the change in bird species use following the enhancement activity, for example. All of these monitoring actions are expected to document functional lift—or change in the targeted function over time—as a direct result of the management action of tree and shrub planting in the wetland buffer. While it is assumed that planting will result in functional lift, it is more correct to state that monitoring of the success or failure of the planting will document a trajectory towards functional lift.

For monitoring purposes, structure is measured as a surrogate of function. Planting appropriate native trees and shrubs is assumed to be a beneficial action. The action is anticipated to benefit native species' richness and diversity and may also have habitat benefits to passerine bird species, for example, by increasing available food, cover, shelter, and habitat interspersion. Therefore, the increase in ecological structure (e.g., trees, shrubs, emergent wetland plants) is often what is measured and monitored because plants, unlike birds and mammals, are fixed in the landscape. Additional monitoring (such as bird monitoring, for example, or amphibian monitoring) can demonstrate habitat functional lift, but typically such monitoring is not undertaken due to cost and time constraints. For this reason, the Work Group has chosen to exclude animal monitoring and will focus efforts on structure monitoring for wetlands.

Many residents in San Juan County value wetlands for their regulating services linked to flood control and carbon storage. Wetlands are also valued for their historical significance in providing food and medicines, such as Labrador tea, salal, and many others. San Juan County society values the aesthetic value of wetlands in addition to the leisure activities they offer. Finally, wetlands offer supporting services such as nutrient cycling, photosynthesis, hydrologic balancing, and much more.

Fish and Wildlife Habitat Conservation Areas (Streams)

The greatest area of intersection between agricultural activity and Fish and Wildlife Habitat Conservation Areas is with streams. Streams are therefore called out and emphasized in the goals and objectives below, separate from terrestrial, upland wildlife habitat areas. The streams in San Juan County have been valued for their provisioning benefits since time immemorial, and much effort has been undertaken to protect streams specifically for salmon habitat, as salmon is not only a food of much cultural significance, but also an indicator species for the health of ecosystems.

Most of the goals and benchmarks related to streams provide metrics and benchmarks for the protection and enhancement of salmon habitat. Therefore, metrics that improve riparian canopy cover, stream structure, and water quality in streams that have been degraded over time and that have lost many salmon populations with the arrival of agriculture are emphasized to restore these waterways as fish-bearing streams.

HYDROLOCIAL FUNCTIONS	HABITAT FUNCTIONS
Transport of water, sediment, & organic material	General fish habitat
Floodwater storage & movement	Anadromous spawning
Groundwater recharge	Invertebrate habitat
Pollution assimilation	Habitat connectivity
Nutrient cycling	Shade
CULTURAL FUNCTIONS	
Food provisioning	Wood

Figure 5: Stream Functions

Anadromous fish are sensitive to ecological disturbances and prefer water conditions that are within the range of 14 to 20 degrees Celsius. They require habitat features such as small pools and rocks or root structures to spawn.

Protection and enhancement of this critical area involves careful consideration of the vegetation, structure, and water quality that make streams hospitable to salmonid species.

Beyond salmonid habitat, streams play a vital role in the hydration of landscapes. Many farms rely on the presence of water to maintain proper hydration in their soils.

Water conveyance is another important stream function. Streams can carry nutrients and sediment downstream, enriching nutrient-poor areas, but also contributing to excess nutrients in other areas.

Fish and Wildlife Habitat Conservation Areas (Upland Habitat)

Many stakeholders are involved in determining the species of most importance on the islands. The need to protect and enhance habitat conservation areas for specific species depends on the values society has placed on individual species. Some values are based on rarity, and others are based on preserving island heritage.

HABITAT FUNCTIONS	CULTURAL FUNCTIONS
Bird habitat	Food provisioning
Mammal habitat	Wood
Biodiversity corridors	**ECOLOGICAL SERVICES**
Habitat connectivity	Filtration
Shade and cover	Carbon capture
Food	Nutrient cycling
Nesting	Water infiltration & storage

Figure 6: Upland Habitat Functions

Many wildlife and habitats of local importance are determined by the Washington State Department of Fish and Wildlife (WDFW) based on their sensitivity. Various other stakeholders have identified animal species and habitats that may require protection, and the functions of surrounding habitats are monitored in accordance.

Special efforts to protect species such as Garry Oak, Golden Eagle, and Island Marble Butterfly, a butterfly endemic only to the islands, have been undertaken in the county and inform many monitoring activities. A full list of species and the entities involved in assigning value for their protection can be found in the table below, as pulled from San Juan County Code SJCC 18.35.115.

Species	Data Sources
Category 1a- Animal species listed under the state or federal Endangered Species Act: brown pelican, common loon, marbled murrelet, peregrine falcon, southern resident orca, stellar sea lion, humpback whale, gray whale, sea otter, Taylor's checkerspot butterfly, chinook salmon (Puget Sound ESU), chum salmon (Puget Sound ESU), steelhead (Puget Sound DPS), bocaccio rockfish (Georgia Basin DPS), canary rockfish (Georgia Basin DPS), yelloweye rockfish (Georgia Basin DPS)	WDFW – Priority Habitat and Species
Category 1b- Plants listed under the state or federal Endangered Species Act: adder's-tongue, arctic aster, blunt-leaved pondweed, California buttercup, coast microseris, erect pygmy-weed, few-flowered sedge, golden paintbrush, lesser bladderwort, Nuttall's quillwort, slender crazy weed, rosy owl-clover, rush aster, sharp fruited peppergrass, twayblade, water lobelia, white meconella, white-top aster	DNR – Natural Heritage Program
Category 2- Shellfish areas	WDFW – Priority Habitat and Species
Category 3- Kelp and eelgrass beds	
Category 4- Herring, smelt, sand lance, and other forage fish spawning areas	
Category 5- Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat	San Juan County
Category 6- Waters of the state: Lakes and streams	
Category 7- State natural area preserves, natural resource conservation areas, and state wildlife areas	
Category 8- Habitats of local importance: 1) Critical saltwater habitats (kelp beds, eelgrass beds, spawning and holding areas for forage fish, subsistence/commercial/recreational shellfish beds, mudflats, intertidal habitats with vascular plants, areas where priority species have a primary association), 2) West side prairie, 3) Herbaceous bald and bluffs, 4) Garry oak woodlands and savannas, 5) Pocket beaches, 6) Bluff backed beaches	
Category 9- Areas with which the following species of local importance have a primary association: black oystercatcher, golden eagle, great blue heron, island marble butterfly, pigeon guillemot, Townsend's big-eared bat, flying squirrel, sharped-tailed snake, western toad, Taylor's checkerspot butterfly, great arctic butterfly, valley silver spot butterfly, sand verbena moth, areas with roosting concentrations of bats, active nests (golden eagle, northern harrier, merlin, black oystercatcher, Wilson's snipe, short-eared owl, long-eared owl, northern pygmy owl, sooty grouse, common nighthawk, American dipper, western bluebird, chipping sparrow, vesper sparrow, horned lark, western meadowlark, western screech owl, lazuli bunting, American kestrel), brittle prickly pear cactus, Alaska alkaligrass	

Figure 7: San Juan County Priority Habitats and Species and The Agency Responsible for Making the Designation

Geologically Hazardous Areas

Geologically hazardous areas are classified in accordance with SJCC 18.35.060. Areas that fall within this classification include landslide-prone areas and erosion hazard areas. Landslide hazards are generally steep or unstable slopes with any of the following characteristics:

- Slopes in excess of 15 percent;
- Pervious soil layers overlying semi-pervious to impervious soil layers; and
- Evidence of springs or groundwater seepage to the surface.

Few landslide hazards intersect with agricultural activities in the county, thus geologically hazardous area goals and benchmarks focus on protecting and enhancing areas prone to erosion.

Erosion hazards are characterized as Class "e" soils, as identified by the United States Department of Agriculture (USDA) in the USDA Soil Survey of San Juan County, Washington (USDA Natural Resources Conservation Service, 2009).

While erosion is a naturally occurring process that can have many benefits to the natural environment, negative impacts may also result from erosion, particularly surrounding homes and habitats of importance, such as coastal zones and bluffs. The Work Group has drawn out strategies to reduce the negative environmental and agricultural impacts which may result from erosion.

Reduction of the impacts to geologically hazardous areas, by means of reduced sediment loads into waterways, reduced landslide risks, and reduced soil compaction, for example, has been identified as a goal. In many cases, the protection and enhancement of geologically hazardous areas has auxiliary benefits to other critical areas such as wetlands and fish and wildlife habitat conservation areas.

Critical Aquifer Recharge Areas

Critical aquifer recharge areas are defined in SJCC 18.35.080. San Juan County has identified a need to "assure a safe and adequate water supply" by protecting the quantity and quality of water available for recharge of the County's aquifers.

Because of the following classifications that define the hydrogeologic conditions of San Juan County's aquifers, all of San Juan County is considered highly susceptible to degradation and thus designated as a critical aquifer recharge area for the following reasons:

1. Hydrogeologic susceptibility to contamination has been determined as moderate to high using Washington State Department of Ecology guidelines (Cook, 2002) and a recharge analysis performed by the United States Geological Service in 2002.
2. San Juan County's aquifers are sole source aquifers, recharged by local rainfall only.
3. Many of the County's aquifers are located in bedrock and are at risk from direct surface contamination.
4. The County's small land areas and extensive shoreline create conditions where the balance between the sea water and freshwater interface is critical to prevent sea water intrusion.
5. Groundwater is an important source of water to lakes and streams that provide both drinking water and water for fish and wildlife.

Given this classification, protecting and enhancing water quantity and quality resources in San Juan County is critical to maintaining the viability of life on the islands. Water is critical for sustaining all life. Water is also essential for many agricultural practices.

Frequently Flooded Areas

San Juan County code defines frequently flooded areas as "lands subject to a one percent or greater chance of flooding in any given year" (SJCC 18.20.060). San Juan County has adopted FEMA's FIRM maps to identify "Special Flood Hazard Areas" within the County. The intent is to protect the public health and safety as it intersects with agricultural activity within these areas.

The Work Group has identified the following priority functions for frequently flooded areas, based on values linked to protection of domestic and agricultural spaces from flood damage, hydrology, and habitat for fish and wildlife:

- Flood storage
- Reduced erosion
- Hydrologic floodplain connectivity
- Habitat for fish and wildlife
- Groundwater recharge

Goals for this critical area include the minimization of flood damage to agricultural operations and the maximization of flood storage capacity.

Agricultural Viability

Agricultural viability can be defined economically, socially, culturally, politically, and environmentally. The Washington State Conservation Commission (Washington State Conservation Commission, 2024) provides the following as an example definition of agricultural viability, originally sourced from the 2016 "Farming in the Floodplain Project: Existing Conditions Report," as the ability of a farmer or group of farmers to:

- Productively farm on a given piece of land or in a specific area,
- Maintain an economically viable farm business,
- Keep the land in agriculture long-term, and
- Steward the land so it will remain productive in the future.

The San Juan County VSP Work Group has identified that a viable agricultural system depends on the following factors:

- An agricultural ethic that culturally and socially values local food production
- A supportive policy environment that allows and encourages farmers to begin farming and to continue farming
- A healthy natural resource base on agricultural lands that responds to climate change
- No net loss of farm land
- A thriving local food economy with ample opportunities for access to market, education, capital, infrastructure, food processing and storage, and shared resources

Many factors contribute to agricultural viability in San Juan County, some of which can be managed locally; however, there are also factors beyond local control, such as climate and global events. The Work Group has identified linkages and measured factors that are directly associated with local agricultural viability.

Many organizations have been involved in tracking Agricultural Viability since before the adoption of the VSP Work Plan (Christensen & Limbach, 2019). The organizations involved are San Juan County Agricultural Resources Committee, San Juan County Food Systems Team, Orcas Food Co-op, San Juan Agricultural Guild, and Washington State University- San Juan County Extension. These organizations are responsible for putting forth reports such as the Food Systems Plan, in addition to recommending numerous code updates and revisions to the San Juan County Comprehensive Plan. Agricultural viability is an ongoing focal point for these and other organizations.

GOALS AND BENCHMARKS

In order to adequately answer the monitoring questions above, the Work Group has put together goals and benchmarks, which guide the monitoring program. The following is a summary of the goals and benchmarks outlined in the 2024 Adaptive Management Plan. These goals guide all monitoring activities described in this plan and are broken out by critical area and agricultural viability.

Goals are separated by protection and enhancement for each critical area, where

- "**protection**" is understood as preventing the degradation of functions and values existing as of July 22, 2011. RCW 36.70A.703(8); and
- "**enhancement**" is understood as improving the processes, structure, and functions existing as of July 22, 2011. RCW 36.70A.703(4).

Protection goals are intended to maintain the status of critical areas functions and values as of July 22, 2011, whereas enhancement goals are intended to improve critical area functions and values from the same date, through the use of voluntary, incentive-based measures.

Benchmarks are further separated by implementation and effectiveness monitoring strategies, which will be discussed in greater detail in subsequent sections.

Wetlands

Goal	Benchmarks		Metrics
Goal 1: Protect wetlands	Implementation		
	1.1	Maintain baseline quantity of all wetland-related BMPs in operation	Number and size of wetland-related BMPs in operation
	Effectiveness		
	1.2	Maintain baseline rates of canopy loss and impervious/semi-impervious gain within wetlands	Rate of canopy loss and impervious/ semi-impervious gain
	1.3	Maintain wetlands functions of water quality, hydrology, and habitat over time	Wetland water quality, hydrological, and habitat assessment scores
Goal 2: Enhance and/or restore wetlands	Implementation		
	2.1	Implement new wetland-related BMPs on 75% of farms with wetlands that have new ISPs written	Number and size of new wetland-related BMPs
	Effectiveness		

Goal	Benchmarks		Metrics
	2.2	Improve wetlands functions of water quality, hydrology, and habitat over time	Wetland water quality, hydrological, and habitat assessment scores

Figure 8: Protection and Enhancement Goals for Wetlands

Fish and Wildlife Habitat Conservation Areas: Streams

Goal	Benchmarks		Metrics
Goal 1: Protect streams	Implementation		
	1.1	Maintain baseline quantity of all stream-related BMPs in operation	Number and size of stream-related BMPs in operation
	Effectiveness		
	1.2	Maintain baseline rates of canopy loss and impervious/semi-impervious gain within riparian zones by mitigating recorded losses with BMPs	Rate of canopy loss and impervious/ semi-impervious gain
	1.3	Maintain stream habitat condition over time by monitoring and maintaining stream vegetation	Stream assessment scores for riparian area quantity, quality, and canopy cover
	1.4	Maintain water quality in streams over time	Stream assessment scores for water quality proxy (nutrient enrichment, manure or human waste presence, aquatic invertebrate community), and water quality sampling when available
Goal 2: Enhance and/or restore streams	Implementation		
	2.1	Implement new stream-related BMPs on farms with streams that have new ISPs written	Number and size of new stream-related BMPs
	Effectiveness		
	2.2	Improve stream habitat following enhancement and/or restoration project (increase in native plant cover, decrease in invasive plant cover)	Stream assessment scores for riparian area quantity, quality, and canopy cover
	2.3	Improve water quality following enhancement and/or restoration project	Stream assessment scores for water quality

Figure 9: Protection and Enhancement Goals for Fish and Wildlife Habitat Areas (Streams)

Fish and Wildlife Habitat Areas: Upland Habitat

Goal	Benchmarks		Metrics
Goal 1: Protect habitats and species of local importance	Implementation		
	1.1	Maintain baseline quantity of all upland habitat-related BMPs in operation	Number and size of upland habitat-related BMPs in operation

Goal	Benchmarks		Metrics
	Effectiveness		
	1.2	Maintain baseline rates of canopy loss and impervious/semi-impervious gain within upland habitat	Rate of canopy loss and impervious/ semi-impervious gain
	1.3	Maintain habitat functions over time	Habitat assessment scores
Goal 2: Enhance and/or restore habitats and species of local importance	Implementation		
	2.1	Implement new habitat-related BMPs on of farms with upland habitat that have new ISPs written	Number and size of new upland habitat-related BMPs
	Effectiveness		
	2.2	Improve habitat functions following enhancement project	Habitat assessment scores

Figure 10: Protection and Enhancement Goals for Fish and Wildlife Habitat Conservation Areas (Upland Habitat)

Geologically Hazardous Areas

Goal	Benchmarks		Metrics
Goal 1: Avoid and minimize the impacts of sedimentation, erosion, and landslide hazards on water quality and fish and wildlife habitat by upland agricultural use	Implementation		
	1.1	Maintain baseline quantity of all GHA-related BMPs in operation	Number and size of GHA-related BMPs in operation.
	Effectiveness		
	1.2	Maintain baseline rates of canopy loss and impervious/semi-impervious gain within GHAs	Rate of canopy loss and impervious/ semi-impervious gain
	1.3	Maintain vegetative buffer widths around streams and wetlands where they intersect with class e soils	Buffer width around streams and wetlands that intersect with class e soils
Goal 2: Enhance geologically hazardous areas	Implementation		
	2.1	Implement new GHA-related BMPs on farms with GHAs that have new ISPs written	Number and size of new GHA-related BMPs
	Effectiveness		
	2.2	Increase vegetative buffers around streams and wetlands where they intersect with class e soils to a minimum of 50’	Buffer width around streams and wetlands that intersect with class e soils

Figure 11: Protection and Enhancement Goals for Geologically Hazardous Areas

Critical Aquifer Recharge Areas

Goal	Benchmarks		Metrics
Goal 1: Protect and maintain groundwater recharge	Implementation		
	1.1	Maintain baseline quantity of all ground water recharge-related BMPs in operation	Number and size of groundwater recharge-related BMPs in operation
	Effectiveness		

Goal	Benchmarks		Metrics
	1.2	Maintain baseline rates of impervious/semi-impervious gain within CARAs	Rate of impervious/ semi-impervious gain
Goal 2: Enhance groundwater recharge	Implementation		
	2.1	Implement new groundwater recharge-related BMPs on farms that have new ISPs written	Number and size of new groundwater recharge-related BMPs
Goal 3: Prevent the degradation of groundwater quality resources due to agricultural activities	Implementation		
	3.1	Maintain baseline quantity of all groundwater quality-related BMPs in operation	Number and size of groundwater quality-related BMPs in operation
Goal 4: Enhance groundwater quality	Implementation		
	4.1	Implement new groundwater quality-related BMPs on farms that have new ISPs written	Number and size of new groundwater quality-related BMPs

Figure 12: Protection and Enhancement Goals for Critical Aquifer Recharge Areas

Frequently Flooded Areas

Goal	Benchmarks		Metrics
Goal 1: Protect frequently flooded areas for habitat and groundwater recharge	Implementation		
	1.1	Maintain baseline quantity of all FFA-related BMPs in operation	Number and size of FFA-related BMPs in operation
	Effectiveness		
	1.2	Maintain baseline rates of canopy loss and impervious/semi-impervious gain within FFAs	Rate of canopy loss and impervious/ semi-impervious gain
	1.3	Maintain habitat functions over time	Habitat assessment scores
Goal 2: Enhance frequently flooded areas for habitat and groundwater recharge	Implementation		
	2.1	Implement new FFA-related BMPs on farms with FFAs that have new ISPs written	Number and size of new FFA-related BMPs
	Effectiveness		
	2.2	Improve overall habitat functions following enhancement project	Habitat assessment scores

Figure 13: Protection and Enhancement Goals for Frequently Flooded Areas

Agricultural Viability

Goal	Benchmarks		Metrics
Goal 1: Maintain and improve agricultural viability over time	Effectiveness		
	1.2	Maintain participation of at least eight agricultural producers per year	Number of ISPs written or updated per year
	1.3	Increase the proportion of farm acres with ISPs to 30% by 2025	Agricultural acres of farms with ISPs as a percentage of total agricultural acres

Figure 14: Agricultural Viability Goals

Agricultural Viability Elements/Goals	Agricultural Viability Strategies	Agricultural Viability Indicators
Economic Prosperity: Support a thriving and viable local farm economy that increases profitability of local farmers.	**1.1. Marketing:** Support and implement strategic plans that develop, strengthen, and expand local and regional market opportunities and sales, including value-added and niche crop production.	1. Gross annual sales of ag products/services produced locally 2. Net profit of ag products/services produced locally 3. Gross sales of farms participating in branding program 4. Farmers market sales 5. % total cost of goods for local ag products at grocery stores
	1.2. Productivity: Provide training, education, research, and technical assistance to promote soil, plant, and livestock health and productivity.	6. # of acres of land farmed (commercial and non-commercial) 7. # people reached through trainings, educational outreach, technical assistance, and internship/apprenticeship programs 8. # of research projects
	1.3. Farmer Capacity: Provide business and farm planning; technical assistance; strategies to access capital; and educational programs to interested farmers and value-added businesses.	9. # of farmers with current business plans (5 years) 10. # of completed farm plans 11. Ability to access skilled labor 12. Ability to access capital.
	1.4. Infrastructure: Expand access to infrastructure, such as shared access to equipment, storage facilities, commercial processing facilities, and transportation.	13. # of farms selling products inter-island and to mainland 14. # of producers that have access to food processing facilities 15. # of shared local transportation systems utilized 16. Revenue generated by local transport services. 17. # of producers identifying access to infrastructure as a challenge. 18. # of producers accessing shared food aggregation and/or storage sites
Farm Retention and Expansion: Maintain and increase number of acres and/or farms in long-term commercial agricultural production by making farmland	**2.1. Farmland Succession**: Connect new farmers to available farmland and mentorship opportunities to ensure farm succession.	19. # of farms with farmland succession plans 20. Average age of farmers 21. # of new farmers accessing farmland
	2.2 Farmland Preservation: Facilitate permanent conservation of farmland using conservation tools that allow for flexibility and adaptability for expansion	22. # of acres of conserved farmland
Agricultural Viability Elements/Goals	**Agricultural Viability Strategies**	**Agricultural Viability Indicators**
available and increasing capacity of farmers.	of agriculture, including new farming practices and infrastructure.	
	2.3 Farm Operations: Maintain and increase the number of commercial farm operations.	23. # of commercial farms
Farm Stewardship and Sustainability: Maintain and increase healthy agricultural natural resource systems that are adaptable to climate change.	**3.1 Stewardship Practices:** Provide technical and financial assistance for implementation of Best Management Practices; provide education and outreach opportunities; and conduct research on sustainable practices.	24. # of BMPs implemented
Policy Environment: Establish a supportive policy environment.	**4.1 Regulatory Stability:** Work with local and regional agricultural organizations and elected officials to promote clear and reasonable policies that promote agriculture.	25. # of new or amended agricultural related policies that support agricultural viability 26. Maintain # acres in Agricultural Resource Land
Agricultural Ethic: Increase the social value of a local food system.	**5.1 Social Values:** Promote the value of local farmers and of a just, equitable, and sustainable food system.	27. # of farm-to-school Programs 28. SNAP gross sales at farmers markets 29. Quantity of food bank donations from local agriculture 30. # of public accessing educational programing on local agriculture 31. # of meals served

Figure 15: Agricultural Viability Goals as Defined in the 2018 Work Plan

ESTABLISHING BASELINE CONDITIONS

The date of inception of VSP, July 22, 2011, is used as the baseline date for reporting. VSP counties determine whether they are meeting their goals and benchmarks by comparing conditions before and after the baseline. If conditions of critical areas at the watershed scale have improved or stayed the same since the baseline date, the county's VSP is said to have succeeded in enhancement or protection goals, respectively. If conditions of critical areas at the watershed scale have degraded since the baseline date, the county will have failed at meeting these goals, and adaptive management of the program is triggered.

In San Juan County, various tools have or will be used in determining pre-2011 baseline conditions. Capturing this data and understanding conditions on the ground before 2011 can be difficult to do retroactively, before a monitoring plan such as this one was established; new tools are also becoming available since the County has started monitoring that better serve this process. Data such as water quality monitoring, for example, exists before 2011, but due to difficulty in maintaining programs, is no longer available. Baseline spatial datasets such as the High Resolution Change Detection data from the Washington Department of Fish and Wildlife are derived from historical aerial imagery, allowing the County to establish baseline rates of change for questions relating to canopy cover, impervious, and semi-impervious surfaces. In other cases, establishing a baseline can be achieved by discussing conditions and practices in place before and since 2011 with the landowners themselves.

In some instances, conditions before 2011 can be reported on; however, in many other cases, data does not exist to identify conditions before 2011. In these cases, i.e. for field protocols only recently adopted by the Work Group, baseline conditions are still being established with current testing. These baseline dates will be established at least partially by 2028, after the completion of the first full five-year monitoring cycle with the new assessment tools. For these field protocols, the baseline date will be recorded as January 1, 2028 instead of July 22, 2011.

MONITORING OVERVIEW

In order to answer the monitoring questions posed by the Work Group, there is a need to distinguish between what work has been done and where, how effective the work was, and who was involved in doing the work. In San Juan County, there are four categories of monitoring that are conducted:

> **Category 1 - Implementation Monitoring** tracks the number and size of Best Management Practices (BMPs) have been implemented and their locations. It serves to compare the practices in place now to 2011 baseline conditions.
>
> **Category 2 - Effectiveness Monitoring** tracks how implemented BMPs affect critical area functions and values relative to pre-2011 baseline levels. It serves to evaluate whether the amount and type of conservation practices that are occurring on the landscape are having the intended effects.
>
> **Category 3 – Participation Monitoring** records the level of engagement from agricultural producers over time.

Category 4 – Agricultural Viability Monitoring tracks how viable the agricultural landscape is and how it is changing over time.

Implementation Monitoring

Implementation Monitoring tracks changes in all critical areas that intersect with farmland to record which practices have been installed on farms. Data is gathered through site visits, surveys, cost share, restoration work, and external sources to inform what work is being done where and by whom. Full assessment tools can be found in Appendix A for reference.

The San Juan Islands Conservation District is responsible for conducting and aggregating data from the following activities to inform implementation benchmarks:

1. **Site Visits:** Site visits for Individual Stewardship Plans (ISP) form the backbone of implementation monitoring data. Planners from the Conservation District meet with cooperators to determine which BMPs have been installed since the farm's inception (or since the most recent ISP). This is a time for planners to recommend new practices to address resource concerns, and the resulting ISP serves as a record of these recommendations. If cooperators have data available on past land uses and improvements prior to their time, this data is also gathered.

2. **Best Management Practice (BMP) Implementation Survey:** This is a survey filled out by landowners and farmers to self-report on historic and current practices installed on their property. The survey tracks fourteen common BMPs with critical area impacts. These are:

   - Access Control
   - Fencing
   - Prescribed Grazing
   - Compost and Waste Storage
   - Conservation Cover
   - Heavy Use Area Protection
   - Residue and Tillage Management, No-Till
   - Cover Crops
   - Wetland Enhancement
   - Riparian Forest Buffer
   - Filter Strip
   - Upland Wildlife Habitat Management and Wildlife Habitat Planting
   - Herbaceous Weed Treatment
   - Nutrient Management
   - Irrigation Water Management and Microirrigation

3. **Completed Cost Share Projects:** The Conservation District is responsible for administering cost share projects with producers. Cost share projects are implemented following the standards set forth by the Natural Resources Conservation Service (NRCS) and often address soil, water, air, plant, animal, human, and energy resource concerns. Cost share project implementation tracks metrics such as quantity installed, date installed, and resource concerns and critical areas impacted.

4. **Cost Share Proof of Performance Reports:** After the completion of a cost share project, cooperators are required to submit a yearly Proof of Performance Report administered by the

Conservation District. This report highlights all practices with an active lifespan and asks for photos to illustrate the condition, functioning, and maintenance of each practice.

5. **Completed NRCS-EQIP Projects:** NRCS will furnish annual data to the Conservation District for use with VSP monitoring. Similar to District cost share, the data tracks metrics such as quantity, date installed, and resource concerns addressed for practices installed through NRCS's Environmental Quality Incentives Program.

   NRCS provides this information at the watershed scale and does not identify individual producers or parcels. While these practices are not directly linked to critical areas, assumptions will need to be made based on the critical areas these practices serve and the list of practices associated with each critical area as defined in the Adaptive Management Plan.

6. **District-Implemented Restoration and Habitat Work:** SJICD has its own conservation workforce, the Island Conservation Corps, a dedicated group of students conducting restoration work, including riparian restoration work on farms. Data is gathered from riparian forest buffer plantings, beaver dam analog installations, and herbaceous weed treatment on farms.

   Similarly, SJICD hosts a habitat restoration program primarily targeted for pollinators, broadly and specifically the island marble butterfly. Data is gathered from wildlife habitat plantings on farms and as conducted through this program.

7. **Other aggregated data:** When available, partner organization data is also gathered. This may include San Juan County restoration data for projects on farms requiring wetland mitigation or for fish passage projects on farms.

Effectiveness Monitoring

Effectiveness monitoring involves the use of spatial analyses and a variety of field-based protocols.

Spatial analyses include the following:

1. **High Resolution Change Detection (HRCD):** Change analysis data is produced and made available every two years by the Washington Department of Fish and Wildlife. Multi-date high resolution aerial imagery is used to detect increases in impervious surfaces and semi-impervious surfaces and decreases in canopy cover across all five critical areas. This data analysis provides an understanding of where changes are occurring on the landscape and helps focus field monitoring and outreach in those change locations. This tool is not suitable for measuring gains in canopy cover (i.e. revegetation). Since HRCD is not designed to measure habitat gains, this data is only used to monitor progress toward protection goals, i.e., maintaining baseline rates of (Quinn, Wilhere, & Krueger, 2020)change since 2011.

2. **Vegetative Stream Buffer Size in Subclass 'E' Soils:** Class "e" is a seismic soil classification that characterizes soils with particular textural and strength indicators of soil stability and is an important marker of areas prone to erosion or similar degradation. High resolution aerial imagery captured every two years by San Juan County is used to measure vegetative buffers around streams where they intersect with class e soils.

Field protocols are unique for each critical area and include the following:

1. **Wetland Rating System (WRS):** The WRS is a rapid screening tool developed by the Washington Department of Ecology (DOE) that categorizes wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide. This tool informs standards for protecting and enhancing wetlands. The tool will be used to categorize farm wetlands based on their water quality, hydrological, and habitat functions at site potential, landscape potential, and value ratings. A composite score for this assessment will be used. When available, private contractor data using the WRS will also be used.

2. **Stream Visual Assessment Protocol (SVAP), version 2:** SVAP2, as stated in the introduction to the protocol is: "a qualitative assessment tool to evaluate features that affect overall stream conditions at the property level. The tool assesses visually apparent physical, chemical, and biological features within a specified reach of a stream corridor" (Natural Resources Conservation Service (NRCS), 2009) Quantitative scores are provided for fifteen elements, and results can be recorded either as an aggregate score or as individual elements.

   For stream habitat in fish and wildlife habitat conservation areas, SVAP2 question elements 4) Riparian Area Quantity, 5) Riparian Area Quality, and 6) Canopy Cover will be used on farm parcels containing streams to assess and classify the habitat functions of streams.

   For stream surface water quality proxy in fish and wildlife habitat conservation areas, SVAP questions 8) Nutrient Enrichment, 9) Manure or Human Waste Presence, and 14) Aquatic Invertebrate Community will be used as indicators for measuring water quality in the absence of a robust water quality testing program, In addition to these elements, components such as dissolved oxygen and temperature will be measured to classify water quality functions of streams.

3. **Water quality in-stream sampling:** water quality sampling has been conducted for stream surface water in fish and wildlife habitat conservation areas, on an inconsistent basis. Water quality sampling is difficult on the islands, as it depends on a reliable access to mainland labs for testing. Given the time sensitivity of tests and consistently delivering samples, the logistical difficulties of sampling have restricted many water quality testing programs. Previous sampling from 2002-2008 by the University of Washington Friday Harbor Laboratories is available for use as a water quality baseline (University of Washington Friday Harbor Laboratories, 2008). Additional data may be available from the Washington Department of Health and Washington Department of Fish and Wildlife (WDFW) may be leveraged to inform changes in water quality in shellfish growing areas (Washington State Department of Health Office of Environmental Health and Safety).

4. **Biology Technical Note-14 (Tech Note-14):** Tech Note-14 was developed by the Natural Resources Conservation Services (NRCS) to measure habitat quality. The tool is used for habitat in frequently flooded areas and upland fish and wildlife habitat conservation areas. This tool provides a relatively simple, quick analysis of the value of aquatic and terrestrial habitat in various agricultural land use areas. The tool is used to evaluate current conditions and predicts

possible future conditions of various alternatives. The tool determines a threshold of scores that meet or do not meet planning criteria for given land uses.

Participation Monitoring

Participation monitoring tracks the evolution of landowner and farmer engagement with voluntary conservation stewardship, and in particular the technical and financial assistance programs the Conservation District offers. In San Juan County, cooperators are highly motivated to implement conservation practices; as a result, demand almost always surpasses SJICD's ability and capacity to meet interest. SJICD has grown to meet the demand and still cannot keep up.

Each year, over twelve producers receive an Individual Stewardship Plan (ISP).[2] In any given moment, over twenty-five producers are on the waitlist for an ISP. Because of the limited capacity to serve all interested cooperators, the District turns to tools such as the previously mentioned BMP Implemententation Survey and the Agricultural Viability Survey, which is discussed in greater detail in the following section. Using these metrics, change over time in participation is tracked and informs outreach plans.

As of 2023, 50 out of 264 farms (19%) have completed the BMP Implementation Survey, and 80 out of 264 (30%) participated in the 2023 Agricultural Viability Survey. More likely than not, much voluntary, landowner-initiated conservation stewardship work on farms goes unnoticed and untracked.

Agricultural Viability

Agricultural viability tracked alongside critical area protection and enhancement. Data is primarily gathered through an Agricultural Viability Survey, which asks participants questions on demographics, farm type, market channels, financials, challenges/barriers, requests for support, and the effects of climate change. These answers are analyzed and used to respond to five principal goals, as established in the 2018 San Juan County VSP Work Plan and reference in Goals and Benchmarks below.

A flow chart of each assessment tool by critical area and agricultural viability can be found below. Timelines, maps, testing protocols, and equipment are described below for each assessment. The assessments are not intended to be used in isolation. Combined, they tell the story of how and why conditions in critical areas and agricultural viability are changing. Taken together, they point towards additional management needed to address concerns in critical areas.

[2] Individual Stewardship Plans in San Juan County are full Resource Management System Plans with additional VSP-specific sections.

Tools and Assessments Used in Monitoring for Each Critical Area and Agricultural Viability

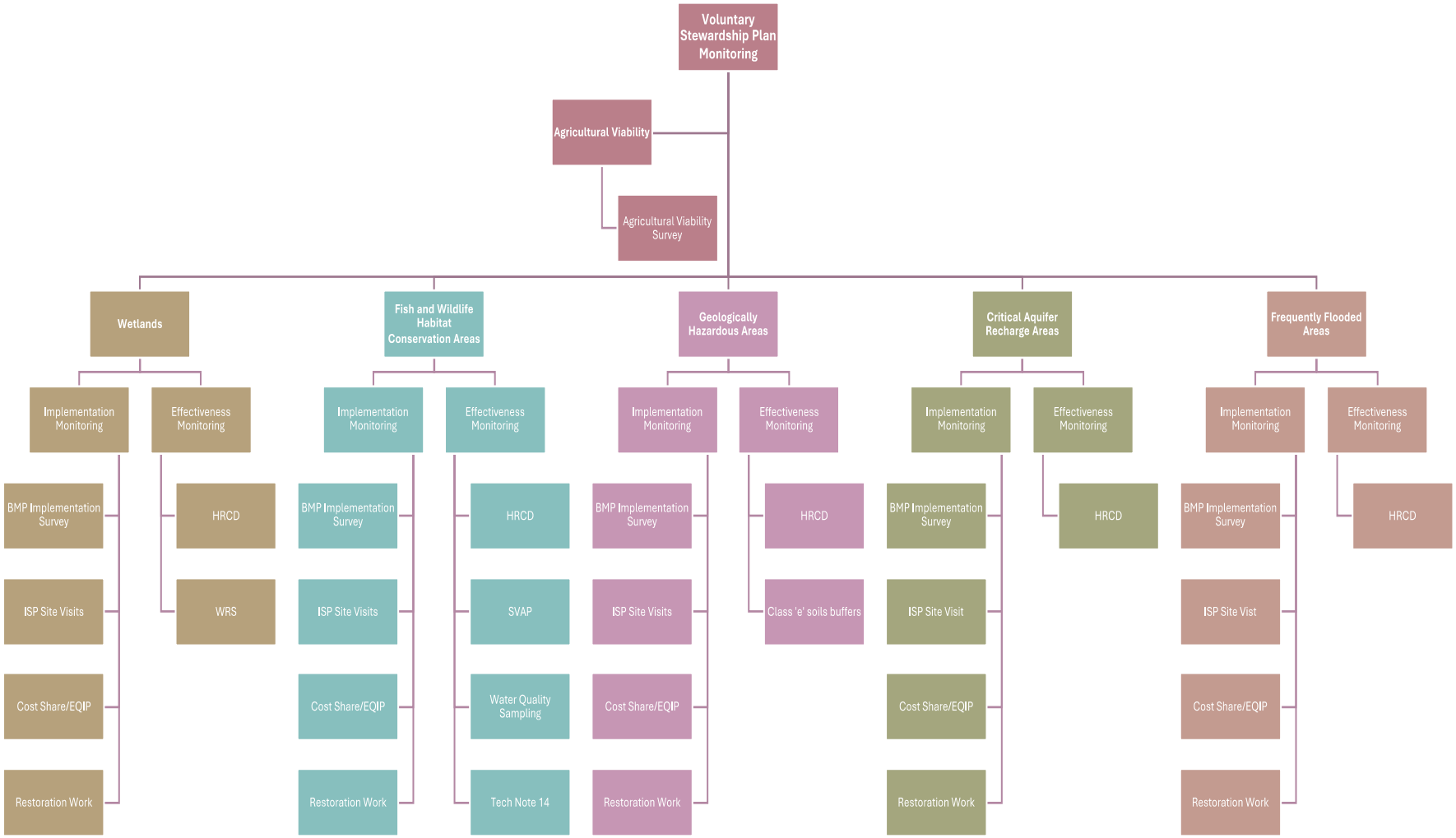

Figure 16: Assessments by Critical Area and Agricultural Viability, Divided by Implementation and Effectiveness Monitoring

PROTOCOLS FOR MONITORING ACTIVITIES

Monitoring will be conducted according to the following protocols:

SITE VISITS
Critical Areas Served
All
Scope
Site visits are conducted for all cooperators interested in receiving an Individual Stewardship Plan or technical assistance. The site visit is an opportunity to collect data on the implementation of Best Management Practices, as completed by the cooperator.
Schedule
Site visits occur as requested throughout the year, averaging two to four visits to unique landowners and farmers in a given month and totaling over thirty per year.
Person Responsible
SJICD Farm Planner
Protocol
Planners from the District meet with cooperators when the cooperator has requested either, 1) technical assistance, 2) financial assistance, 3) a new farm plan (ISP), or 4) an update to an existing farm plan. In the case of a new contact with a land manager, planners will survey land managers and observe field conditions to which, if any, BMPs are already in place at the time of the site visit. Planners will ask land managers to report on both practices they have installed and practices others have installed before them, to the best of their knowledge. Practices installed before 2011 will be used in ongoing efforts to establish baseline conditions. In the case of a continued contact with a land manager requesting additional assistance, planners will survey the land manager on practices implement *since the date of the prior visit and assistance*.
Data Management
Data will be recorded spatially when possible and saved to the GIS database named 'Farm Plan Data Map' with units and types of practices by means of the feature class layer 'Farm Plan Data BMPs and Misc.' Data will also be recorded and saved to the CRM database QuickBase under Customer, Project, and BMP tables, using the project name "bmpsimplemented." For more information on best practices for recording data, see the guide named "QuickBase Planning App: Best Practices for SJICD Natural Resource Planners" found internally for SJICD staff on the QuickBase Planning App home page.

BMP IMPLEMENTATION SURVEY
Critical Areas Served
All
Scope
The BMP Implementation Survey is sent to all known farmers in the county, with the goal of at least 30% farmer participation. The BMP Implementation Survey can be used as a tool during site visits to facilitate data gathering on BMP implementation, as completed by the cooperator. The survey is also a means of reaching land managers who have not participated in other VSP or SJICD programs and assistance.
Schedule
The survey is sent to all producers, whether they have already taken the survey or not, every five years with the goal that farmers will continue to report on practices implemented in perpetuity. Surveys are sent at the beginning of the calendar year.
Person Responsible
SJICD Agriculture Program Lead
Protocol
The BMP Implementation Survey is hosted through the ESRI application called Survey123 and stored on SJICD's organization page. It is a digital survey that records spatial data and attributes linked to BMP implementation. Every five years, the survey will be sent to producers using an email list maintained in partnership with Washington State University- San Juan County Extension (WSU) and the Agricultural Resources Committee (ARC). In addition to emails, post cards, posters, and other outreach strategies will be explored to maximize reach. Reminders will be sent periodically over the course of a month, and known land managers who are not represented in the survey results will be contacted individually to encourage the completion of the survey. When funding is available to support incentives, raffle prizes may be awarded for the completion of the BMP Implementation Survey. These incentives have included: soil tests, water meters, pasture forage sticks, and biochar. The results will automatically populate both a map and a database.
Data Management
Data will be automatically populated spatially and non-spatially and will feed the master GIS database named 'Farm Plan Data BMPs and Misc by means of the layer 'VSP_Best_Management_Practices_Survey_Data.' Data will also be recorded and saved to the CRM database QuickBase under Customer, Project, and BMP tables, using the project name "bmpsimplemented."

COMPLETED COST SHARE PROJECTS
Critical Areas Served
All
Scope
All cooperators receiving cost share. Cooperators are eligible to receive cost share based on the cost share eligibility requirements as outline in the SJICD Cost Share Policy. Cooperators work in tandem with the District to submit an application, often to the Washington State Conservation Commission, for project approval. Each year, approximately five to seven new contracts are established.
Schedule
Cost share completion occurs throughout the year, often following a biennial schedule.
Person Responsible
SJICD Agriculture Program Lead
Protocol
Planners from the District work with cooperators to apply for cost share for desired practices that address resource concerns. The application process and relevant documents can be found in the District's Cost Share Policy. Completed practices furnish implementation monitoring data and provide specifics on quantity, location, and critical area/resource concern addressed. With the completion of cost share projects, a Proof of Performance report is sent yearly at the beginning of each calendar year to cooperators who report on the state of the practice, provide a photo point, and relay other useful monitoring information to ensure that the practice is used for its intended purpose and maintained for the entirety of its lifespan.
Data Management
Data will be recorded spatially when possible and saved to the GIS database named 'Farm Plan Data Map' by means of the layers 'Public Sharing BMP Points' and/or 'Farm Plan Data BMPs and Misc' feature class layers with units and types of practices. Data will also be recorded and saved to the CRM database QuickBase under Customer, Project, and BMP tables, using the project name "agcostshare."

COST SHARE PROOF OF PERFORMANCE
Critical Areas Served
All
Scope
All cooperators receiving cost share.
Schedule
Proof of Performance reports occur once a year at the beginning of the year.
Person Responsible
SJICD Agriculture Program Lead
Protocol
Planners from the District send a letter to all cost share recipients each year during the entire duration of a practice's lifespan to verify if the practice is still used for its intended purpose and if it has the desired effect. Photo points and a short narrative are required for cooperators to fill out and send back.
Data Management
Data will be used to ensure the maintenance of practices installed.

COMPLETED EQIP PROJECTS
Critical Areas Served
All
Scope
All cooperators receiving funding through the Natural Resources Conservation Service (NRCS). Cooperators work in tandem with the NRCS planners to apply for project approval.
Schedule
EQIP project completion occurs throughout the year, and contracts are obligated on a one to four year schedule. NRCS will provide a report with EQIP project completion data to SJICD once a calendar year for projects that have been completed during that year.
Person Responsible
SJICD Agriculture Program Lead to coordinate with NRCS
Protocol
Planners from the District work with cooperators to apply for cost share for desired practices that address resource concerns. The application process and relevant documents can be found in the District's Cost Share Policy. Completed practices furnish implementation monitoring data and provide specifics on quantity, location, and critical area/resource concern addressed. With the completion of cost share projects, a Proof of Performance report is sent yearly at the beginning of each calendar year to cooperators who report on the state of the practice, provide a photo point, and relay other useful monitoring information to ensure that the practice is used for its intended purpose and maintained for the entirety of its lifespan.
Data Management
Data will be recorded and saved to the CRM database QuickBase under Project and BMP tables, using the project name "EQIP." Customer names will be recorded when possible, but given data sensitivity in sharing across agencies, individual cooperators may not be listed in dataset.

COMPLETED SJICD RESTORATION PROJECTS
Critical Areas Served
Fish and Wildlife Habitat Conservation Areas (Streams), Fish and Wildlife Habitat Conservation Areas (Upland Habitat), Wetlands
Scope
Habitat installation and restoration projects involving the District's Island Conservation Corps (ICC), Island Marble Butterfly Program, and other District Implemented Projects (DIPs). Work is completed in partnership with private landowners and partner agencies on sites that have been identified as a high priority for restoration work in the county and where funding and labor is available to complete the work.
Schedule
Restoration project completion occurs throughout the year.
Person Responsible
SJICD Data and Mapping Specialist to aggregate field data
Protocol
Field technicians will complete restoration projects according to conservation priorities and landowner goals.
Data Management
Data is collected in the field using ESRI's FieldMaps application Survey123 for ICC projects, including riparian forest buffer plantings, beaver dam analogs, and herbaceous weed treatments. ICC students are trained in best practices for recording data. Restoration data for ICC work and other habitat work is saved to the 'ICC Data Reporting Jan 2024' or 'ICC Invasive Tracking and Removal' feature layers, both owned by ICC_SJICD. For VSP use, both layers are filtered to only display work occurring on farms. The filtered data is included in the 'Farm Plan Data Map' web map with units, types of practices, and installation or work dates. Data will also be recorded and saved to the CRM database QuickBase under Customer, Project, and BMP tables, using the project name "riparian" or "habitat."

OTHER AGGREGATED DATA
Critical Areas Served
All
Scope
External data may also be gathered across the county. This may include San Juan County restoration data for projects on farms requiring wetland mitigation or for fish passage projects on farms.
Schedule
When available
Person Responsible
SJICD Agriculture Program Lead to aggregate data
Protocol
Data will be gathered when available in partnership with agencies across San Juan County.
Data Management
Data will be aggregated as it becomes available and used in reporting analyses.

HIGH RESOLUTION CHANGE DETECTION
Critical Areas Served
All
Scope
HRCD change analysis is conducted using WDFW's HRCD dataset combined with spatial layers identifying critical areas and farms in the county.
All farms with wetlands
All farms with streams (use 200-foot stream buffer to define riparian management zone)
All farms with upland habitat associated with FWHCAs
All farms (for CARA)
All farms with frequently flooded areas
Schedule
HRCD data is produced by WDFW every two years for the two prior years (i.e. at the time of this plan, 2019-2021 data is the most recent and was made available in 2023). A final analysis of all data since the baseline will be conducted three months prior to each five-year report due date, i.e. September 2025, September 2030, etc.
Person Responsible
SJICD Data and Mapping Specialist
Protocol
HRCD analysis is performed in ArcGIS Pro to measure the loss of tree canopy and semi-pervious and impervious surface gains where critical areas and agriculture intersect. The steps for running the analysis are summarized below. Additional information can be found in the 'Tips for using HRCD change data for VSP monitoring and analysis' document available on the WDFW website. 1. Download the most recent HRCD dataset from WDFW. 2. Add the HRCD, farm parcels, and critical area layers to an ArcGIS Pro project. Ensure that critical area layers are re-downloaded and up to date before running the analysis. 3. Use the **buffer** tool to add a 100' buffer to the 'fish distribution' (Windrope, Rentz, Folkerts, & Azerrad, 2020) layer to create a 'stream FWHCA' layer and the **merge** tool to combine the 'regulated areas', 'camas prairies', 'Garry oak habitat', and 'natural heritage program plants' layers into a single 'upland FWHCA' layer.[3] 4. Use the **clip** tool with each of the 6 critical area layers as input features and 'farm parcels' as the clip feature. Name the output features '[critical area]_ag_intersect'. 5. Use the **clip** tool with the HRCD layer as the input features and each '[critical area]_ag_intersect' layer as the clip feature. Name the output features '[critical area]_ag_changes'. 6. Use the **add fields (multiple)** tool to add the following fields: • Acres (vsp) • Total change (vsp acres) • Tree loss (vsp acres) • Impervious Surface Increase (vsp acres)

[3] A 100ft riparian management zone was determined based on recommendations from Washington State Department of Fish and Wildlife and is based on Site Potential Tree Height.

- Semi-Pervious Surface Increase (vsp acres)

7. Use the **calculate geometry attributes** tool to populate the new 'Acres (vsp acres)' field, set the property to Area (geodesic) and the area Unit to US survey acres.
8. Use the **calculate field** tool to populate the new 'Total change (vsp acres)' field by multiplying 'Acres (vsp)' by the existing 'Total change (percent)' field. Repeat for the remaining new fields using the corresponding percent fields.
9. Use the **select layer by attribute** tool to filter records where the field 'End Year' is equal to the last year of change data (for 2017-2019 round of analysis, the end year is 2019).
10. Use the **table to excel** tool to export the selected features, label the file '[critical area]_HRCD_[start year-end year]' for example, 'Stream_FWHCA_HRCD_2017-2019'
11. Use pivot tables to calculate the sum of total change acres and sum by change type (tree loss, impervious surface gain, and semi-pervious surface gain). Use additional filters as needed. For CARA changes, report only on change acres from impervious and semi-pervious surface gains; for all other critical areas, report on the total change acres.
12. Repeat steps 6-11 for each '[critical area]_ag_changes' layer.
13. Report will include both an analysis of total change since the baseline, and also change in the previous five-year period preceding the five-year report. Rates of change will be compared.

Post-analysis includes the following:

14. Archive old farm parcels layers from 'San Juan County Farm Parcels" every year for the ability to re-run analysis and retain agricultural acreage from any given year.

Data Management

Final excel sheets with completed pivot tables are stored in SJICD's SharePoint under Documents>VSP>Monitoring>HRCD. Baseline change data (2006-2011) can be found here as well. A sample analysis can be found in the report titled Riparian Habitat on San Juan County Agricultural Lands. (Long, 2024)

Additional Required Data

A list of feature layers needed for an HRCD analysis can be found below:

- **San Juan County Farm Parcels 2022** – County layer, owned by Daniel Root. This layer is the earliest year for which a farm parcel map exists and serves as a proxy for the baseline (2011) representation of where agriculture occurs in the county. The layer is updated as additional cooperators work with the district to receive ISPs or technical assistance.
- **San Juan County Farm Parcels 2023** – This layer, owned by Cathi Winnings, is derived from the county's 2022 farm parcel layer. The layer is updated as additional cooperators work with the district to receive ISPs or technical assistance.
- **Critical Areas** – All from San Juan County Polaris:
    - **Wetlands** – Possible Tidal Wetlands; Possible Non-Tidal Wetlands
    - **FWHCA** - Fish Distribution; Regulated Areas; Camas Prairie; Garry Oak Habitat; Natural Heritage Program Plants
    - **GHA** – Soils with Subclass e
    - **CARA** – Critical Aquifer Recharge Areas
    - **FFA** - FEMA Flood Insurance Map Layers

CLASS E SOILS AND VEGETATIVE STREAM BUFFERS SPATIAL ANALYSIS
Critical Areas Served
Geologically Hazardous Areas
Scope
The class e soils analysis is conducted using San Juan County high resolution aerial imagery, class e soils from SSURGO (Soil Survey Geographic Database), and San Juan County water courses, on farms containing streams with class "e" soils.
Schedule
This analysis will be conducted three months prior to each five-year report due date, i.e. September 2025, September 2030, etc.
Person Responsible
SJICD Data and Mapping Specialist
Protocol
ArcGIS Pro is used to calculate the amount of vegetated stream buffers that intersect with agricultural parcels and class e soils. Results indicate the percent of stream buffers that are vegetated. 1. Create 100' buffer along streams. 2. Intersect buffer with farm parcels and class e soils. 3. Digitize vegetation boundaries within buffer polygons. 4. Create new field: actual_veg. 5. Subtract new vegetation boundaries from 100' buffer layer to calculate vegetation area within 100' zone: (product is vegetated buffers). 6. Add area field=acres of vegetation. 7. Calculate percent of vegetation (vegetated buffers/100' buffer).
Data Management
Final excel sheets with completed pivot tables are stored in SJICD's SharePoint under Documents>VSP>Monitoring>classesoils. Baseline change data (2006-2011) can be found here as well.
Additional Required Data

A list of feature layers needed for the analysis can be found below:
• 20XX aerial basemap — the most recent San Juan County aerial imagery is used
• San Juan County Farm Parcels 20XX — This layer, owned by Cathi Winings, is derived from the original VSP farm parcel mapping exercises that took place during the creation of the Work Plan. This layer is updated regularly as needed.
• Critical Areas:
  ○ FWHCA – Water courses
  ○ GHA – Soils with subclass e from SSURGO database

STREAM VISUAL ASSESSMENT PROTOCOL, DISSOLVED OXYGEN, AND TEMPERATURE
Critical Areas Served
Fish and Wildlife Habitat Conservation Areas (Streams)
Scope
SVAPs are conducted on farms that contain streams for farmers who have worked with the Conservation District in the past to demonstrate if practices installed are effective. See Appendix B for maps of stream reaches by watershed and testing year.
On average fifteen SVAPs per year
SVAP will be conducted on all the following water type classifications: Type "S"= Shoreline, Type "F" = Fish, Type "Np"= Non-Fish, and Type "Ns"= Non-Fish Seasonal
If the initial site visit does not confirm San Juan County's mapping, i.e. a mapped stream has features that more closely resemble a ditch or swale, SJICD may not be able to conduct this assessment and may exclude these locations from future monitoring.
Schedule
Every year in early spring at low stream flow in different watersheds, on a five-year rotating cycle, beginning in 2023 (Year 1)
Person Responsible
SJICD Riparian Program Lead
Protocol
Streams will be assessed following the guidelines as developed by NRCS (Natural Resources Conservation Service (NRCS), 2009) and in accordance with relevant trainings. SVAP2 contains sixteen unique elements that are scored to provide a total stream condition score. Only Elements 4-6 will be used in VSP monitoring for stream habitat condition, while only Elements 8, 9, and 14 will be used in VSP monitoring for stream water quality; however, the best practice will be to conduct the full SVAP for all elements. The steps for conducting the SVAP2 are summarized below. 1. An appropriate assessment reach for streams is, at minimum, a length of stream equal to 12 times the bankfull channel width, estimated by examining the lowest elevation at which the first flat depositional surface occurs in addition to other high water mark features. 2. Along the entire length of the reach, observe the stream and answer the questions, one by one. 3. Elements 4, 5, and 6 ask the field technician to rate on a scale of 1-10 for both the right and left banks riparian habitat quantity, quality, and canopy cover. Analysts will visually assess the types and numbers of trees as well as percentage of shade over the stream to make their assessment. 4. Element 8 asks about algal growth in the stream and can be determined by observation. Element 9 asks about the presence of livestock or other manure contributors near the water—this element can be determined by observation and conversation with property owners. Finally, Element 14 requires technicians to collect a water sample and observe in a separate tray for signs of invertebrates. These are typed according to an SVAP companion field guide, and species of invertebrates are noted. Certain species may serve as indicators of water quality, due to their ability/inability to tolerate and preference for certain conditions linked to lack of oxygen, high temperatures, etc.

5. SJICD has digitized the SVAP2 assessment for ease of field use. The assessment has been uploaded to GIS's Survey123, which not only allows for in field data capture, but also permits the user to record spatial points to note the exact point of the stream reach assessment for future assessments.

As an addition to the SVAP2, all stream reaches will receive a dissolved oxygen and temperature reading. These readings are conducted using the same probe. Dissolved oxygen measures vary highly depending on when samples are taken, and therefore it is important to conduct these assessments at the same time of year (early spring) to ensure data reliability and consistency. Fully submerge the probe into the water without touching the bottom of the stream to avoid contaminating sample. Hold probe submerged for at least one minute or until reading has stabilized.

Data Management

SVAP data reported through the Survey123 platform is automatically saved in the 'SVAP Field Assessment_form' feature layer owned by Intern_SJCGIS. The scores for questions 4-6 and 8,9, and 14 are added together and recorded in the customer's Field Data table in QuickBase in the SVAP 'Vegetative Sum' field and 'SVAP Water Quality Sum' fields respectively. The overall SVAP score is also recorded in QuickBase.

Equipment

A list of supplies needed for an SVAP analysis can be found below:

- Measuring tape
- D-net for aquatic invertebrates
- Tray for aquatic invertebrates
- Dissolved oxygen/temperature probe
- iPad with GIS

WETLAND RATING SYSTEM
Critical Areas Served
Wetlands
Scope
WRSs are conducted on farms that contain wetlands greater than one half acre for farmers who have worked with the Conservation District in the past. See Appendix C for maps of agricultural parcels with wetlands by watershed and testing year.
On average fifteen WRSs per year
The initial site visit will either confirm San Juan County's mapping, or lead SJICD staff to consult with a wetland biologist if they believe that site conditions do not match San Juan County's wetland mapping. The wetland biologist will document existing conditions and submit proposed changes, if any, to San Juan County's Community Development and Planning Department for their review and approval. San Juan County Community Development staff will review the documentation, and if approved, will request a change to the wetland map layer from San Juan County's GIS Department based on the documentation provided.
Schedule
Every year in early spring in different watersheds, on a five-year rotating cycle, beginning in 2023 (Year 1). While WRS sampling will be prioritized for the wetter months of February to April, as it is easier to record conditions of wetlands when surface water is present; however, sampling may also occur year-round if needed.
Person Responsible
SJICD Riparian Program Lead
Protocol
Wetlands will be assessed following the guidelines as developed by the Department of Ecology (Washington State Department of Ecology, 2023) and in accordance with relevant trainings. WRS contains three unique elements over three unique functions that are scored to provide a total wetland classification score based on specific attributes such as rarity, sensitivity to disturbance, the ability to replace the wetlands, and functions they provide. The resulting rating provides a basis for developing standards for protecting and enhancing wetlands. Steps for rating wetlands using this tool are summarized below: 1. WRS asks technicians to first identify the location and boundaries of wetlands. Identifying the boundaries of a wetland may be conducted with a wetland delineation, or using mapped wetland locations that are verified on the ground. The entire wetland will be scored. 2. Next, classify the type of wetland (Depressional, Riverine, Lake Fringe, and Slope) based on a preliminary questionnaire. 3. Then, classify plant communities using the Cowardin classification (Forested Class, Scrub-Shrub Class, Emergent Class, Aquatic Bed Class). 4. Once a classification is obtained, the technician will refer to the specific assessment and guide for that wetland. Points are assigned based on water quality, hydrology, and habitat. The assessment may lead technicians to external resources such as aerial site maps, aerial 1km radius maps, and more.

5. The points obtained through the answers to these questions is recorded as either “Improving Water Quality,” “Hydrologic,” or “Habitat” for each of the categories of “Site Potential,” “Landscape Potential,” and “Value.” 6. A summed value of all of these scores is be used to quantify wetland category.
Data Management
Values for water quality, hydrology, and habitat are recorded separately across each of the categories of “Site Potential,” “Landscape Potential,” and “Value” in QuickBase under in the Field Data table. The overall WRS score and classification is also recorded.
Equipment
A list of supplies needed for a WRS analysis can be found below: • Clipboard • Pen • Aerial maps (of site and of 1km radius) • Shovel • Wire flags

Parcels that have received District assistance will be prioritized for SVAPs and WRSs to demonstrate if practices installed are effective in protecting critical areas. As future ISPs and cost share projects are conducted, further parcels will be added to the list of potential testing sites. Testing will depend on landowner willingness for repeated surveys. Cooperators will be contacted at the beginning of the year and asked to give permission for access to their property. Partners such as the San Juan County Conservation Land Bank and San Juan Preservation Trust will provide key access to critical sites where agriculture and critical areas intersect.

The below table and map further outline the monitoring schedule protocols for streams and wetlands. Watersheds are broken up into five groups for testing, beginning in 2023.

Year 1	Year 2	Year 3	Year 4	Year 5
• Deer Harbor • President Channel • West Sound • G & Coves • North Shore • Eastsound • Raccoon Point • Doe Bay	• False Bay	• Mitchell Bay • Roche Harbor • Spieden Channel • Westcott Bay • Garrison Bay • Haro Straight • San Juan Channel • Friday Harbor • Griffin Bay • Juan de Fuca Strait	• Shoal Bay • Upright Channel • Swift Bay • Fisherman Bay • San Juan Channel • Lopez Sound • Hunter Bay • Mackaye Harbor • Outer Bay • Aleck Bay • Mud Bay • Hughes Bay • Watmough Bay	• Davis Bay • Shaw Island • Decatur Island • Waldron Island

Figure 17: Watersheds by Monitoring Year

	Target Number of Stream Assessments (SVAP2) and Wetlands Assessments (WRS) per Year											
	2024 (Year 2)	**2025 (Year 3)**	Five-Year Report	**2026 (Year 4)**	**2027 (Year 5)**	**2028 (Year 1)**	**2029 (Year 2)**	**2030 (Year 3)**	Five-Year Report	**2031 (Year 4)**	**2032 (Year 5)**	**2033 (Year 1)**
SVAP Assessments (SVAP2)	17	12		10	9	15	17	12		10	9	15
Wetland Assessments (WRS)	20	10		12	14	14	20	10		12	14	14

Figure 18: Number of Individual Stream Assessments (SVAP2) and Wetlands Assessments (WRS per Year based on Watershed

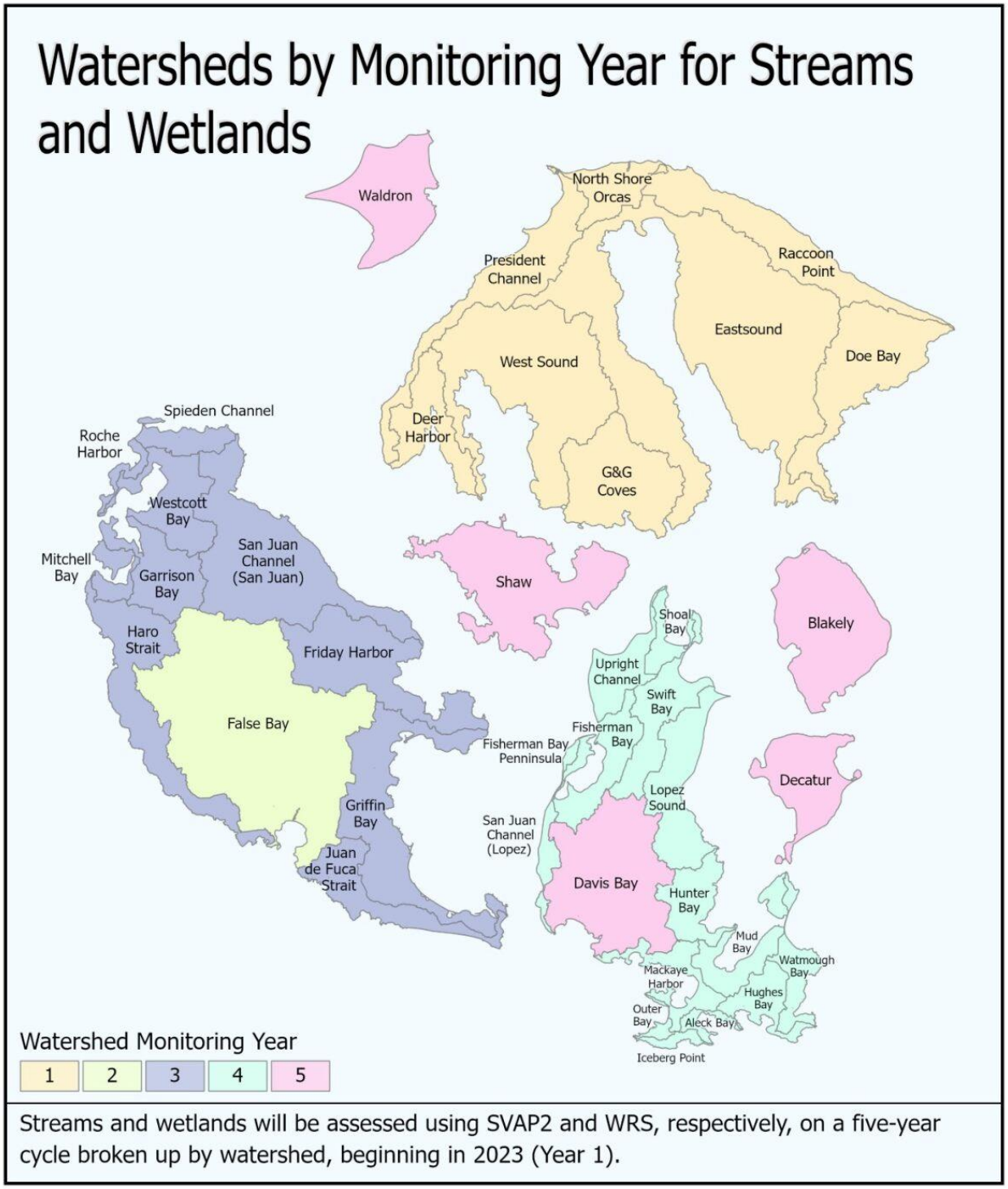

Figure 19: Watersheds by Monitoring Year

BIOLOGY TECHNICAL NOTE-14
Critical Areas Served
Fish and Wildlife Habitat Conservation Areas (Upland Habitat) and Frequently Flooded Areas
Scope
All farms with upland habitat or frequently flooded areas receiving an ISP.
WDFW will be consulted for habitat management plan recommendations where occurrences of protected species under Fish and Wildlife Habitat Conservation Areas are confirmed in the field and VSP participants choose to implement the habitat management recommendations for mapped species. Staff will consult with WDFW and other habitat management agency staff (such as USFWS and NOAA Fisheries) every two years to ensure that published habitat management guidelines are the most current and up to date literature available. Plant species protected under San Juan County's Fish and Wildlife Habitat Conservation Areas Ordinance are documented in San Juan County's GIS system. If a protected plant species were mapped as occurring on an Individual Stewardship Plan property, CD staff would seek to verify that species occurrence with a site visit, accompanied by a qualified expert as needed. Management of the species would occur in cooperation with Washington Natural Heritage Program rare plant botanists and follow management recommendations for rare plant species as documented in Washington DNR's Rare Plant Field Guide.
Schedule
Assessments are conducted at the time of the ISP sit visit, with each new and updated ISP. Assessments are also conducted prior to cost share projects.
Person Responsible
SJICD Farm Planner
Protocol
Tech Note-14 asks the planner to identify factors such as water availability, management, and vegetation that impact wildlife habitat across seven land uses. Planners fill out the form in excel, for each of the land uses in the agricultural area. Each question is assigned a score based on criteria outlined in side-by-side companion guide. The program automatically calculates a composite score for each land use and determines whether the land use meets habitat planning criteria, a percentage threshold used to identify where additional work can be done
Data Management
Assessments are conducted by hand or in office following a visit. Planners save individual files in a folder with all other ISP materials. Individual scores are recorded for each land use in QuickBase in the Field Data table.

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AGRICULTURAL VIABILITY SURVEY
Critical Areas Served
Agricultural Viability
Scope
The Agricultural Viability Survey is sent to all known farmers in the county.

Schedule
This survey is released every three to five years, and a subsequent report is developed. The report draws on data analysis from previous surveys to track how conditions are changing over time.
Person Responsible
SJICD Agriculture Program Lead to coordinate with partners
Protocol
2017, 2020, and 2023 Agricultural Viability surveys and reports were conducted in partnership with a WSU consultant from the Social and Economic Sciences Research Center (SERC). Survey questions are modified with each new survey round, keeping questions as similar as possible for consistency across years. Questions address demographics, type of farm operation, market channels, financials, challenges, support needed, and the impacts of climate change. The survey is sent to an email list of over 200 agricultural producers, a list maintained and updated by SJICD, ARC, and WSU San Juan County Extension. Reminders are sent via email and mail to maximize survey response rates. After survey results are collected, data is analyzed across themes to answer key questions related to the viability of agriculture in the county. Results are compared to previous datasets to track changes in agricultural viability over time.
Data Management
Data management is shared across organizations. Reports are made available online on each partner website, and raw data is stored in Google documents for accessibility across organizations.

The below table depicts yearly timing of all assessments.

Monitoring Assessment	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Site Visits	X	X	X	X	X	X	X	X	X	X	X	X
BMP Implementation Survey	X											
Completed Cost Share Projects	X	X	X	X	X	X	X	X	X	X	X	X
Cost Share Proof of Performance	X											
Completed EQIP Projects	X											
Completed SJICD Restoration Projects	X	X	X	X	X	X	X	X	X	X	X	X
High Resolution Change Detection						X						
Class E Soils						X						
Wetland Rating System		X	X	X								
Stream Visual Assessment Protocol			X	X								
Biology Technical Note-14	X	X	X	X	X	X	X	X	X	X	X	X

Agricultural Viability Survey	X											

Figure 20: Monthly Assessment Calendar

STAFF RESOURCES

The District will provide staff for each of the assessments outlined above, with the exception of EQIP and other county available data. The table below outlines the person responsible for overseeing each of the assessments.

Monitoring Assessment	Person Responsible
Site Visits	SJICD Planner
BMP Implementation Survey	SJICD Agriculture Program Lead
Completed Cost Share Projects	SJICD Agriculture Program Lead
Cost Share Proof of Performance	SJICD Cost Share Program Lead
Completed EQIP Projects	SJICD Agriculture Program Lead to coordinate with NRCS Liaison
Completed SJICD Restoration Projects	SJICD Data and Mapping Specialist
High Resolution Change Detection	SJICD Data and Mapping Specialist
Class E Soils	SJICD Data and Mapping Specialist
Stream Visual Assessment Protocol	SJICD Riparian Program Lead and private contractors
Wetland Rating System	SJICD Riparian Program Lead
Biology Technical Note-14	SJICD Planner
Agricultural Viability Survey	SJICD Agriculture Program Lead

Figure 21: Person Responsible for Assessments

Trainings

Trainings will be conducted as needed to provide staff with support in conducting these assessments. Priority will go towards training program leads and documenting procedures for each assessment with the goal of institutional knowledge to be kept and passed on within the District.

In the fall of 2022, over fifteen SJICD staff members and Island Conservation Corps members gathered to participate in a Stream Visual Assessment Protocol training led by NRCS biologist Rachel Maggi. The training was very successful in not only teaching proper techniques and observational methodologies for the assessment, but also in calibrating assessments scores across different users. Each individual was tasked with conducting the assessment, and the group came together at the end to discuss and compare results. While numerical values for questions varied, scores typically aligned in their categorical value. To maintain consistency moving forward, the District will aim to reduce users conducting the assessments;

when this is not possible, scores will be evaluated categorical (i.e. adequate or good) instead of numerically to maintain precision.

In the spring of 2024, one SJICD staff member underwent a training for the Department of Ecology Wetland Rating System. This training provided a foundation for the tool for the Riparian Program Lead to conduct assessments and further train additional staff as needed.

Ongoing training will form part of the monitoring plan, and SJICD will seek out trainings as needed to sustain monitoring program.

Equipment Storage and Maintenance

Equipment is stored in a dedicated shed and labeled for its intended use. Calibration of tools such as temperature probes and dissolved oxygen meters will occur each year before testing to ensure that tools maintain adequate levels of precision and accuracy.

DATA COLLECTION, MANAGEMENT, AND REPORTING

After data is collected, it will be stored in two separate databases:

- **ArcGIS**, a spatial database for data requiring a geolocated point, line, or polygon. In-field surveys are used, when possible, for capturing restoration work and SVAP scores. ArcGIS stores data on installed BMP type, amount, and location; SVAP scores and stream reach site; farm parcels; and restoration projects. Critical area layers are also stored spatially in the county's ArcGIS server. The 'Farm Plan Data Map' web map houses all farm data. Each time a new cost share project is completed, it is entered into the web map. Similarly, BMP Implementation Survey data feeds into the web map. A farm parcels layer included in the web map tracks parcels with an agricultural component and is populated by aggregating county data, with every new ISP, and by word of mouth.
- **QuickBase**, a Customer Relations Manager (CRM)-style database used to capture tabular data. SJICD uses QuickBase to record customer, project, BMP implementation information, and field data. While some data is redundant across both platforms, QuickBase allows the user to quickly generate tables and reports to summarize data effectively and efficiently for reporting. Reporting is calculated by averaging assessment results in the watershed. An example of such a report can be seen below.

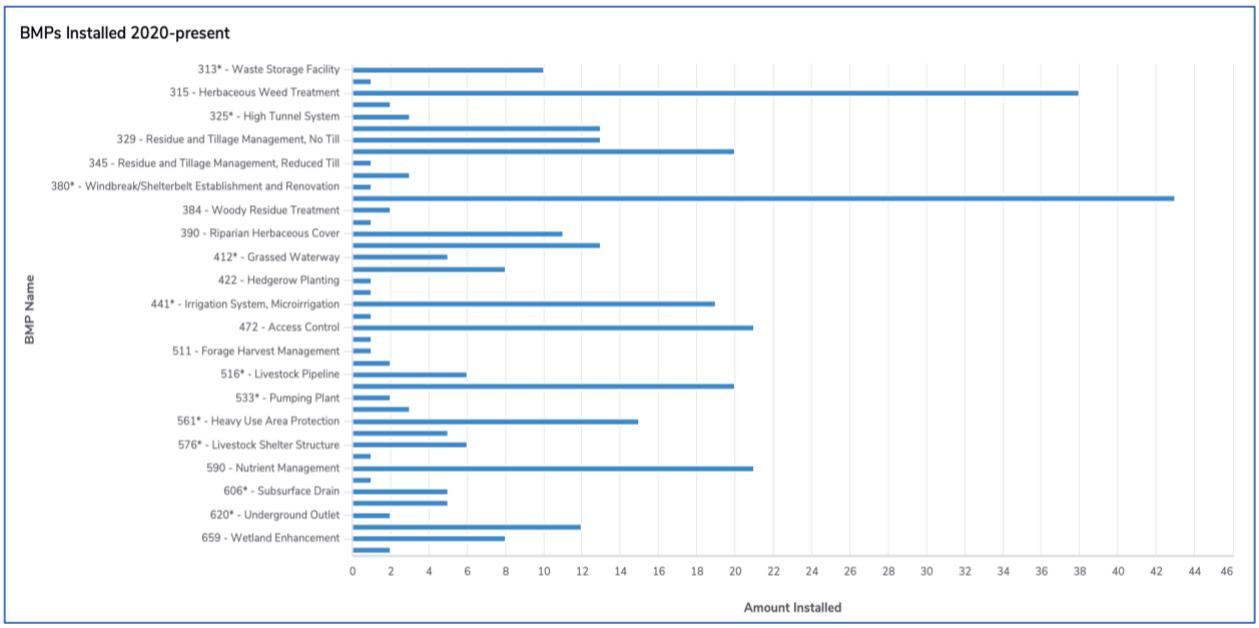

Figure 22: Using QuickBase to Summarize BMP Implementation Metrics

Both the database choices were chosen with reporting needs and capabilities in mind. Both ArcGIS and QuickBase have built in reporting and analysis tools to allow for easy retrieval and frequent reviews of the data both for quality control and drawing insights from the data. The goals and benchmarks rely on metrics that can be consistently collected with integrity over time. This ensures that monitoring data is usable in answering the questions identified by the Work Group.

Reporting

Tracking changes in critical area functions and values will take time. The San Juan Islands Conservation District works with producers to help in the technical and financial implementation of many practices; some of these involve revegetating, others may involve installing infrastructure to reduce impact on other parts of the land. These practices have been researched and proven to address resource concerns, but it is still essential to show that practices installed are effective in accomplishing the goals they are asked to fulfill. Shifts in the health of the land may be observed over long periods of time. For that reason, this Monitoring Plan has been developed with the future in mind.

San Juan County is required to report on a five-year cycle how conditions are changing. With practices such as revegetation, establishment of the practice may take well over that amount of time. In order to prove effectiveness, longer timelines may be necessary to demonstrate whether a given practice can fulfill its desired effect.

The goals and benchmarks identified in the Adaptive Management Plan address the need for continued monitoring in the long-term. They define the levels at which additional action (or the “do something level”) is needed.

Data Quality Objectives

The quality of insights gathered from monitoring data is directly related to the quality of the data collected. Quality controls exist for the collection, storage, and analysis of monitoring data.

Data quality in the collection stage is most important for field protocols where assessor bias can impact results. This is alleviated by keeping the pool of assessment takers small and providing on-going trainings and opportunities for assessors to compare scores and sampling techniques.

Living documentation of field and reporting protocols and spatial analyses help ensure consistency among assessors and analysts over time by institutionalizing knowledge within the District.

Field data is recorded electronically through ESRI's Survey123 or FieldMaps applications. Results are sent directly to the ArcGIS database, minimizing the chance of input errors. Location data is likewise stored with the submission which allows repeat surveys to be conducted in the same sampling location.

Select scores from field survey data are manually transferred from ArcGIS to QuickBase. By entering field data into QuickBase, reminders can be set for the dates of repeat surveys to ensure data is collected at the same time of year. External GPS accessories are used to improve location accuracy for the devices used to collect field data. This ensures the location of sampling remains the same across the years.

Implementation monitoring data is entered manually in both the ArcGIS and QuickBase databases as practices are implemented. The reporting capabilities of QuickBase allow the District to track the progress towards meeting the implementation goals and benchmarks at any point in the reporting cycle. The protocols for inputting implementation data are also documented and frequent check-ins on data best practices ensure consistency among QuickBase users.

UPDATING THE MONITORING PLAN AND ADAPTIVE MANAGEMENT

This Monitoring Plan is subject to review and revision as needed. The current Monitoring Plan, as submitted in 2024, was developed in congruence with the 2024 Adaptative Management Plan. Subsequent adaptive management may be undertaken if goals and benchmarks are not being met in the county. If and as this occurs, the San Juan County VSP Work Group will reassess the goals and benchmarks in the Work Plan and modify the Monitoring Plan as needed. Every five years, the Monitoring Plan will also be reevaluated to ensure that the most up-to-date tools and processes are used to address monitoring goals. When new tools are developed that better meet the needs of the program, they will be considered and added to the Monitoring Plan.

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Appendix A – Assessment Tools

A-1 Best Management Practices Implementation Survey

Share Your Stewardship for VSP

This survey is intended for farmers and agricultural producers of San Juan County, Washington. If you are a landowner conducting agricultural practices in the county, this survey is for you. Completing the 15 minute survey will help demonstrate that San Juan County producers are protecting critical areas by implementing voluntary conservation activities.

The good stewardship practices that you share will be used to report on BMP implementation progress at the county scale, so your individual information will be kept private. However, if you would like to showcase conservation practices on your farm, you will have an opportunity to share with others at the end of this survey under Question #26: Landowner Authorization. Note: It is District policy to keep cost share participant information private until or unless the landowner gives permission to share it.

Your local conservation district wants to help you tell your story and help you continue to advance your sustainable farming practices. If you need assistance in completing this survey, please contact us at pauline@sjicd.org or (360) 378-6621.

Learn more about the Voluntary Stewardship Program here.

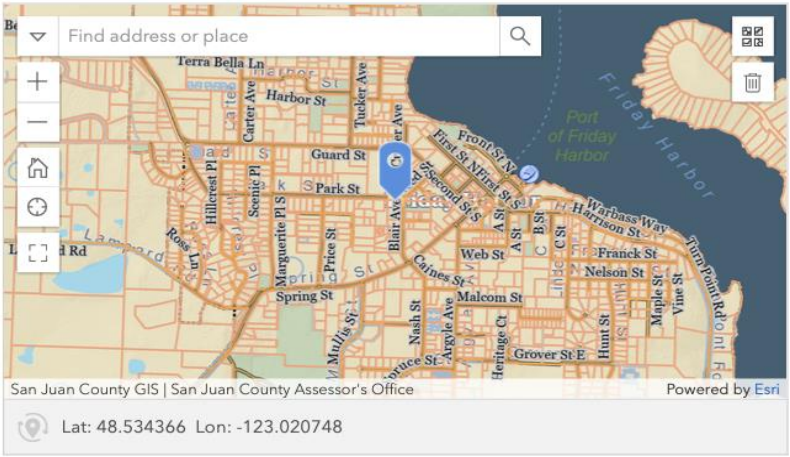
Thank you for supporting VSP!

Property Information

1. Where is your property?

Please zoom in to the approximate location of your property and click at the center.

The purpose of this mapping exercise is to locate the island and general vicinity of where conservation practices are taking place. If you choose to mark your property on the map, other users will not be able to zoom in directly to your property. You may also choose to put the location at a nearby road intersection for privacy.



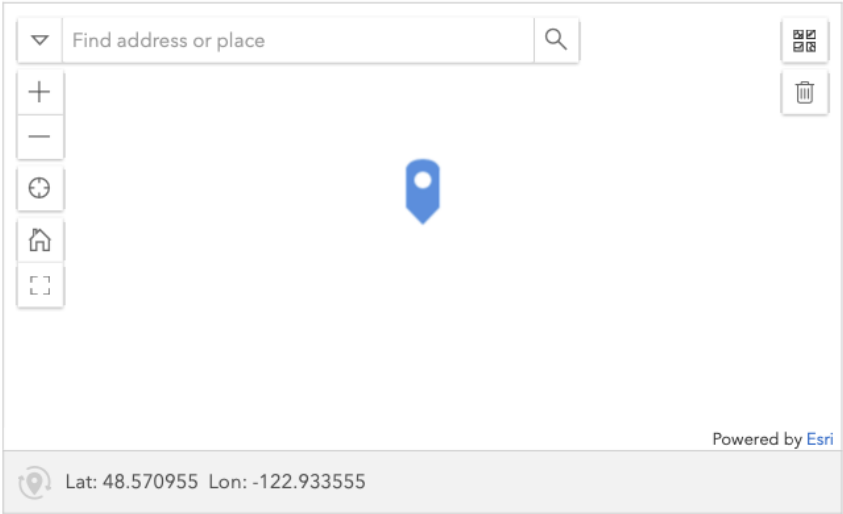
2. On what island is your property located?*

-Please select-

3. Are there critical areas located on your property?*

Use the map to zoom in to your property. View the legend below the map to identify which critical areas exist on your property.

Hint: all properties within San Juan County contain a Critical Aquifer Recharge Area.



Legend						
Wetlands	**Fish & Wildlife Habitat Conservation Areas**			**Frequently Flooded Areas**	**Geologically Hazardous Areas**	**Critical Aquifer Recharge Area**
Possible Tidal Wetlands (along the coast where sea and land meet)	Streams			Flood Zone Type	Slope Greater Than 15%	Critical Aquifer Recharge Area
Possible Non-Tidal Wetlands		Shoreline	Regulated Area	A / AE	Soils With Subclass 'e'	
NWI Wetlands		Fish	Camas Prairie	VE		
		Fish	Garry Oak Habitat			
		Non-Fish	Natural Heritage Program Plants			
		Non-Fish seasonal				

4. Which critical areas exist on your property?*

Use the map above to learn more about which critical areas exist on your property. If it isn't mapped, but you think there is a critical area, please select it. (Remember, all of San Juan County is a Critical Aquifer Recharge Area.).

- [ ] Wetlands
- [ ] Fish and Wildlife Habitat Conservation Areas
- [ ] Frequently Flooded Areas
- [ ] Geologically Hazardous Areas
- [x] Critical Aquifer Recharge Area

5. Please indicate your type of operation (check all that apply):*

- [ ] Hay/pasture
- [ ] Cropland
- [ ] Livestock
- [ ] Vegetables and fruit
- [ ] Flowers
- [ ] Other

Conservation Practices

6. Access control and fencing*

Do you keep livestock out of wetlands, streams, or seasonally wet areas using permanent or temporary fencing, or timing restrictions?

- ( ) Yes, fencing installed before July 2011
- ( ) Yes, fencing installed after July 2011
- ( ) Yes, fencing installed both before and after July 2011
- ( ) No/Not Applicable
- ( ) No, but I'm interested
- ( ) Not sure

7. Compost or Waste Storage Facility*

If you have livestock, do you regularly collect manure and store it in a compost facility or waste storage facility?

Compost facility: Structure used to contain and facilitate the aerobic breakdown of manure and/or other organic material into a final product that is stable for application to land as a soil amendment.

Waste storage facility: Structure used to store manure, agricultural by-products, wastewater, and contaminated runoff.

- ○ Yes, facility installed before July 2011
- ○ Yes, facility installed after July 2011
- ○ Yes, facility installed both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

8. Heavy Use Area Protection*

If you have livestock, do you use a heavy use area (a hardened "sacrifice area") to reduce mud and increase chore efficiency?

- ○ Yes, installed before July 2011
- ○ Yes, installed after July 2011
- ○ Yes, both installed before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

9. Prescribed Grazing*

Do you manage the harvest of vegetation with grazing and/or browsing animals? For more information on this practice, see here.

- ◯ Yes, prescribed grazing in place before July 2011
- ◯ Yes, prescribed grazing in place after 2011
- ◯ Yes, prescribed grazing in place both before and after July 2011
- ◯ No/Not Applicable
- ◯ No, but I'm interested
- ◯ Not sure

10. Conservation Cover*

Have you established and/or maintained permanent vegetative cover on your property? For more information on this practice, see here.

- ◯ Yes, planted before July 2011
- ◯ Yes, planted after July 2011
- ◯ Yes, planted both before and after July 2011
- ◯ No/Not Applicable
- ◯ No, but I'm interested
- ◯ Not sure

11. Cover Crops*

Do you plant any grasses, legumes, or leafy ground cover for **seasonal** vegetative cover? For more information on this practice, see here.

- ○ Yes, planted before July 2011
- ○ Yes, planted after July 2011
- ○ Yes, planted both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

12. Residue and Tillage Management: No-Till*

If you have cropland, do you use no-till practices to limit soil disturbance? For more information on this practice, see here.

- ○ Yes, no-till implemented before July 2011
- ○ Yes, no-till implemented after July 2011
- ○ Yes, no-till implemented both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

13. Wetlands*

If you have a wetland on or near your property, have you completed any work to maintain, enhance, or restore it, or do you manage the wetland habitat for wildlife?

- ◯ Yes, work completed before July 2011
- ◯ Yes, work completed after July 2011
- ◯ Yes, work completed both before and after July 2011
- ◯ No/Not Applicable
- ◯ No, but I'm interested
- ◯ Not sure

14. Riparian Vegetation*

If you have a stream on or near your property, have you maintained or completed any work to enhance herbaceous (non-woody) plants or trees/shrubs?

- ◯ Yes, work completed before July 2011
- ◯ Yes, work completed after July 2011
- ◯ Yes, work completed both before and after July 2011
- ◯ No/Not Applicable
- ◯ No, but I'm interested
- ◯ Not sure

15. Filter Strip*

If you have any wetlands, streams, or seasonally wet areas on your property, do you maintain any vegetated strip of land adjacent to such areas to filter overland flow? For more information on this practice, see here.

- ○ Yes, implemented before July 2011
- ○ Yes, implemented after July 2011
- ○ Yes, implemented both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

16. Upland Wildlife Habitat*

Do you keep any upland areas (away from streams/wetlands) on your property for wildlife habitat, or have you planted vegetation in upland areas to establish wildlife habitat? For more information on this practice, see here.

- ○ Yes, implemented before July 2011
- ○ Yes, implemented after July 2011
- ○ Yes, implemented both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

17. Herbaceous Weeds*

Have you removed invasive weeds from your property?

- ○ Yes, removed before July 2011
- ○ Yes, removed after July 2011
- ○ Yes, removed both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

18. Nutrient Management*

Do you manage the amount, source, placement, and timing of plant nutrients and soil amendments (such as manure, fertilizers, compost, etc.)? For more information on this practice, see here.

- ○ Yes, managed before July 2011
- ○ Yes, managed after July 2011
- ○ Yes, managed both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

19. Irrigation*

If you irrigate, do you have a plan that defines when irrigation is needed and the amount and rate of water to apply?

- ○ Yes, plan in place before July 2011
- ○ Yes, plan in place after July 2011
- ○ Yes, plan in place both before and after July 2011
- ○ No/Not Applicable
- ○ No, but I'm interested
- ○ Not sure

20. Other Practices

Have you implemented other practices not listed above that may help to protect critical areas (wetlands, fish and wildlife habitat conservation areas (including streams), frequently flooded areas, geologically hazardous areas, or critical aquifer recharge areas)?

If yes, please describe.

Add any details about previously answered questions here, too.

912

Almost Done!

21. Name

Please enter your name.

22. Email

Please enter your email.

23. Address

Please enter your physical address.

24. BMP Photos

Do you have a photo of a successful BMP that helps to protect a critical area? If so, please share with others by uploading one or two photos here. Before and after shots are also great. With your permission (in Question # 26), photos can be displayed on a clickable map of San Juan County in the VSP StoryMap associated with this survey.

1 Drop image here or select image

25. BMP Description

If you attached a photo, please briefly describe the BMP.

26. Landowner Authorization*

Do you give San Juan Islands Conservation District permission to post your farm location (at a nearby road intersection) and/or submitted photos on a BMP StoryMap? If you choose yes, this is an opportunity to promote your farm and good stewardship practices. We will contact you prior to any posting. If you choose no, we will not share your location or photos.

- Yes, location and photos
- Yes, only photos
- No
- Explanation or further instruction (if needed)

27. Assistance

Please select any items that you are interested in.

- [ ] I would like to request technical assistance.
- [ ] I would like more information about the Voluntary Stewardship Program and farm planning.
- [ ] I would like more information about the cost share assistance program.
- [ ] I'm not sure if I have critical areas on my property.
- [ ] Other

Enter to Win

By taking this survey, you are eligible to enter a raffle to win a water meter, soil sample, or pasture stick. Supplies are limited. Rank your top choices by January 15th, 2023 to be considered.

- Water Meter
- Soil Test
- Pasture Stick

Reset

Do you own or lease this land mentioned in this survey?*

- ○ Own
- ○ Lease
- ○ Other

Submit

A-2 Western Washington Wetland Rating System, Version 2 (2023)

Wetland name or number _____

RATING SUMMARY – Western Washington

Name of wetland (or ID #): _____ Date of site visit: _____

Rated by_____ Trained by Ecology?__ Yes ___No Date of training_____

HGM Class used for rating_____ Wetland has multiple HGM classes?___Y ____N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ____ (based on functions___ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	**TOTAL**
Score Based on Ratings										

Score for each function based on three ratings
(order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	

Wetland Rating System for Western WA: 2014 Update 1
Rating Form – Version 2, July 2023

Wetland name or number _____

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number _____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ____The wetland is on a slope (slope can be very gradual),
   ____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ____The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number _____

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number _____

DEPRESSIONAL AND FLATS WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed plants > 95% of area points = 5 Wetland has persistent, ungrazed plants > ½ of area points = 3 Wetland has persistent, ungrazed plants □ $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants <$^1/_{10}$ of area points = 0	
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is □ ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	
Total for D 1 Add the points in the boxes above	

Rating of Site Potential If score is: **__12-16 = H ___6-11 = M ___0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	
Total for D 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: **__3 or 4 = H ___1 or 2 = M ___0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	
Total for D 3 Add the points in the boxes above	

Rating of Value If score is**: __2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	
Total for D 4 Add the points in the boxes above	

Rating of Site Potential If score is: **__12-16 = H ___6-11 = M ___0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	
Total for D 5 Add the points in the boxes above	

Rating of Landscape Potential If score is: **__3 = H ___1 or 2 = M ___0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): ☐ Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2 ☐ Surface flooding problems are in a sub-basin farther downgradient. points = 1 ☐ Flooding from groundwater is an issue in the sub-basin. points = 1 ☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 ☐ There are no problems with flooding downstream of the wetland. points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for D 6 Add the points in the boxes above	

Rating of Value If score is: **__2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover >$^3/_4$ area of wetland points = 8 Depressions cover > ½ area of wetland points = 4 Depressions present but cover ≤ ½ area of wetland points = 2 No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) Trees or shrubs > $^2/_3$ area of the wetland points = 8 Trees or shrubs > $^1/_3$ area of the wetland points = 6 Herbaceous plants (> 6 in. high) > $^2/_3$ area of the wetland points = 6 Herbaceous plants (> 6 in. high) > $^1/_3$ area of the wetland points = 3 Trees, shrubs, and ungrazed herbaceous < $^1/_3$ area of the wetland points = 0	
Total for R 1 Add the points in the boxes above	

Rating of Site Potential If score is: **__12-16 = H ___6-11 = M ___0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Other sources _____ Yes = 1 No = 0	
Total for R 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: **__3-6 = H ___1 or 2 = M ___0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the drainage in which the unit is found.) Yes = 2 No = 0	
Total for R 3 Add the points in the boxes above	

Rating of Value If score is: **__2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS **Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion	
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks). If the ratio is more than 20 points = 9 If the ratio is 10-20 points = 6 If the ratio is 5-<10 points = 4 If the ratio is 1-<5 points = 2 If the ratio is < 1 points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes). Forest or shrub for > $^{1}/_{3}$ area OR emergent plants > $^{2}/_{3}$ area points = 7 Forest or shrub for > $^{1}/_{10}$ area OR emergent plants > $^{1}/_{3}$ area points = 4 Plants do not meet above criteria points = 0	
Total for R 4 Add the points in the boxes above	

Rating of Site Potential If score is: **__12-16 = H ___6-11 = M ___0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = 0 No = 1	
R 5.2. Does the upgradient watershed include a UGA or incorporated area? Yes = 1 No = 0	
R 5.3. Is the upgradient stream or river controlled by dams? Yes = 0 No = 1	
Total for R 5 Add the points in the boxes above	

Rating of Landscape Potential If score is: **__3 = H ___1 or 2 = M ___0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The sub-basin immediately downgradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther downgradient points = 1 No flooding problems anywhere downstream points = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for R 6 Add the points in the boxes above	

Rating of Value If score is: **__2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

LAKE FRINGE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	
L 1.0. Does the site have the potential to improve water quality?	
L 1.1. Average width of plants along the lakeshore (use polygons of Cowardin classes): Plants are 33 ft (10 m) wide points = 6 Plants are 16 ft (5 m) wide and <33 ft points = 3 Plants are 6 ft (2 m) wide and <16 ft points = 1 Plants are less than 6 ft wide points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of cover is total cover in the unit, but it can be in patches. Herbaceous does not include aquatic bed. Cover of herbaceous plants is >90% of the vegetated area points = 6 Cover of herbaceous plants is >$^2/_3$ of the vegetated area points = 4 Cover of herbaceous plants is >$^1/_3$ of the vegetated area points = 3 Other plants that are not aquatic bed > $^2/_3$ unit points = 3 Other plants that are not aquatic bed in > $^1/_3$ vegetated area points = 1 Aquatic bed plants and open water cover > $^2/_3$ of the unit points = 0	
Total for L 1 Add the points in the boxes above	

Rating of Site Potential If score is: **__8-12 = H ___4-7 = M ___0-3 = L** *Record the rating on the first page*

L 2.0. Does the landscape have the potential to support the water quality function of the site?	
L 2.1. Is the lake used by power boats? Yes = 1 No = 0	
L 2.2. Is > 10% of the area within 150 ft of wetland unit on the upland side in land uses that generate pollutants? Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plant growth such as milfoil? Yes = 1 No = 0	
Total for L 2 Add the points in the boxes above	

Rating of Landscape Potential: If score is: **__2 or 3 = H ___1 = M ___0 = L** *Record the rating on the first page*

L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources? Yes = 1 No = 0	
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in the basin is on the 303(d) list)? Yes = 1 No = 0	
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the lake or basin in which the unit is found.) Yes = 2 No = 0	
Total for L 3 Add the points in the boxes above	

Rating of Value If score is: **__2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

LAKE FRINGE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce shoreline erosion	
L 4.0. Does the site have the potential to reduce shoreline erosion?	
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include Aquatic bed): Choose the highest scoring description that matches conditions in the wetland. > ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 6 > ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide — points = 4 > ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 4 Plants are at least 6 ft (2 m) wide (any type except Aquatic bed) — points = 2 Plants are less than 6 ft (2 m) wide (any type except Aquatic bed) — points = 0	

Rating of Site Potential: If score is: **__6 = M ___0-5 = L** *Record the rating on the first page*

L 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
L 5.1. Is the lake used by power boats with more than 10 hp?	Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the unit at least 1 mile in distance?	Yes = 1 No = 0	
Total for L 5	Add the points in the boxes above	

Rating of Landscape Potential If score is: **__2 = H ___1 = M ___0 = L** *Record the rating on the first page*

L 6.0. Are the hydrologic functions provided by the site valuable to society?	
L 6.1. Are there resources along the shore that can be impacted by erosion? If more than one resource is present, choose the one with the highest score. There are human structures or old growth/mature forests within 25 ft of OHWM of the shore in the unit — points = 2 There are nature trails or other paths and recreational activities within 25 ft of OHWM — points = 1 Other resources that could be impacted by erosion — points = 1 There are no resources that can be impacted by erosion along the shores of the unit — points = 0	

Rating of Value: If score is**: __2 = H ___1 = M ___0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _____

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% points = 1 Slope is greater than 5% points = 0	
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	
Total for S 1 Add the points in the boxes above	

Rating of Site Potential If score is: **__12 = H ___6-11 = M ___0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	
Total for S 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: **__1-2 = M ___0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) Yes = 1 No = 0	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which unit is found.) Yes = 2 No = 0	
Total for S 3 Add the points in the boxes above	

Rating of Value If score is: **__2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream erosion	
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	

Rating of Site Potential If score is: **__1 = M ___0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	

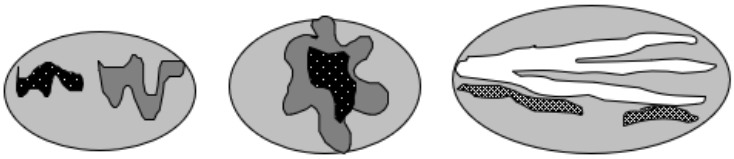
Rating of Landscape Potential If score is: **__1 = M ___0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther downgradient points = 1 No flooding problems anywhere downstream points = 0	
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for S 6 Add the points in the boxes above	

Rating of Value If score is: **__2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _____

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. ____Aquatic bed — 4 structures or more: points = 4 ____Emergent — 3 structures: points = 2 ____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 ____Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon	
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods). ____Permanently flooded or inundated — 4 or more types present: points = 3 ____Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 ____Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland ____Intermittently or seasonally flowing stream in, or adjacent to, the wetland **____Lake Fringe wetland — 2 points** **____Freshwater tidal wetland — 2 points**	
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. **None** = 0 points — **Low** = 1 point — **Moderate** = 2 points All three diagrams in this row are **High** = 3 points 	

Wetland Rating System for Western WA: 2014 Update 13
Rating Form – Version 2, July 2023

Wetland name or number _____

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ____Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ____Standing snags (dbh > 4 in.) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	
Total for H 1 Add the points in the boxes above	

Rating of Site Potential If score is: **__15-18 = H ___7-14 = M ___0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% Total accessible habitat is: > $^1/_3$ (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	
Total for H 2 Add the points in the boxes above	

Rating of Landscape Potential If score is**: __4-6 = H ___1-3 = M ___< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	

Rating of Value If score is: **__2 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number _____

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number _____

- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats
- **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes **–** Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes **= Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No = **Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No **= Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

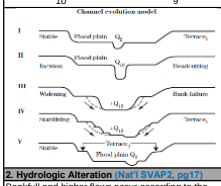
Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

A-3 WA Stream Visual Assessment Protocol 2 Field Reference Sheet (2018)

Stream/Reach Name: BFW ____ x 12 =____ **WA SVAP 2 Field Reference Sheet (Ver 2)**

Landowner's Name: Evaluator: _____ Date_____

1. Channel Condition (Nat'l SVAP2, pg 9)			
Natural, stable channel with established bank	***If channel is incising (appears to be downcutting or degrading), score this element based on the descriptions in this upper section of the matrix:***		
No discernible signs of incision or aggradation; active channel and floodplain connected throughout reach, and flooded at natural intervals; streambanks low with few or no bank failures; **Stage I : Score 10 Stage V: Score 9 (terrace)**	Evidence of past incision and some recovery; some bank erosion possible; active channel and floodplain are connected in most areas, inundated seasonally; streambanks may be low or appear to be steepening; top of point bars are below active floodplain. **Stage I: Score 8 Stage V: Score 7-8 Stage IV: Score 6**	Active incision evident; plants are stressed , dying or falling in channel; active channel appears to be disconnected from the floodplain, with infrequent or no inundation; steep banks, bank failures evident or imminent ; point bars located adjacent to steep banks. **Stage IV: Score 5 Stage III: Score 4 Stage II: Score 3**	Headcuts or surface cracks on banks; active incision; vegetation very sparse; little or no connection between floodplain and stream channel, and no inundation; steep streambanks and failures prominent; point bars, if present, located adjacent to steep banks. **Stage II or III, scores ranging from 2 to 0, depending on severity.**
10 9	***If channel is aggrading (appears to be filling in and is relatively wide and shallow), score this element based on the descriptions in this lower section:***		
	Minimal lateral migration and bank erosion; a few shallow places in reach, due to sediment deposits.	Moderate lateral migration and bank erosion; deposition of sediments causing channel to be very shallow in places; one or 2 bars in channel.	Severe lateral channel migration, and bank erosion; deposition of sediments causing channel to be very shallow in reach; braided channels (3 or more channels).
	8 7 6	5 4 3	2 1 0
	Comments:		

2. Hydrologic Alteration (Nat'l SVAP2, pg17)				
	*Development=roads, railways, structures, land converted for ag, etc **Natural flow regime = streamflow unaltered by water withdrawal, floodplain development, levees, subsurface drainage,			
Bankfull and higher flows occur according to the natural flow regime, generally every 1 to 2 years, AND No dams, dikes, development in the floodplain*, or water control structures are present ; AND natural flow regime** prevails.	Bankfull and higher flows occur only once every 3 to 5 years, or less often than the local natural flow regime. Development in the floodplain, stream water withdrawals, flow augmentation, or water control structures may be present but do not significantly alter the natural flow regime.	Bankfull and higher flows occur only once every 6 to 10 years. Development in the floodplain, stream water withdrawals, flow augmentation, or water control structures alter the natural flow regime.	Bankfull and higher flows rarely occur or occur more frequently than once/year. Stream water withdrawals completely de-water channel; and/or flow augmentation, stormwater or urban runoff discharges directly to stream and severely alters the natural flow regime.
10 9	8 7 6	5 4 3	2 1 0
Comments:			

3. Bank Condition - Rate entire property (Nat'l SVAP2, pg19) *Natural wood/rock does not include riprap, gabions, log cribs, or fabricated revetments. **Bank failure=section of bank that has collapses and falls into stream				
Banks are stable; protected by roots of natural vegetation, wood, and rock*; no man-made structures present on bank; no bank failures**; no recreational or livestock access.	Banks are moderately stable, protected by roots of natural vegetation, wood, rock or a combination of materials; limited number of structures present on bank; evidence of bank failures; recreational use and, or grazing do not negatively impact bank condition.	Banks are moderately unstable; very little protection of banks by roots of natural wood, vegetation, or rock; man-made structures cover more than half of reach or entire bank; active bank failures; recreational and/or livestock use contributing to bank instability.	Banks are unstable; no bank protection with roots, wood, rock or vegetation; riprap, and/or other structures dominate banks; numerous active bank failures; recreational and/or livestock use contributing to bank instability.	
Right Bank 10 9	8 7 6	5 4 3	2 1 0	
Left Bank 10 9	8 7 6	5 4 3	2 1 0	
Comments:				

4. Riparian Area Quantity - Rate entire property (NRS) (Natural plant community means species that are native or introduced species that have become naturalized and function similarly to native sp.)				
Natural plant community covers the entire active floodplain and vegetation gaps generally contiguous, not exceeding 10% of the estimated length of the stream on the property.	Natural plant community extends at least 50 feet. Vegetation gaps do not exceed 30% of the stream reach on the planning unit.	Natural plant community extends at least 35 feet. Vegetation gaps do not exceed 30% of the estimated length of the stream on the planning unit.	Natural plant community extends at least 35 feet. Vegetation gaps exceed 30% of the estimated length of the stream on the planning unit.	Natural plant community extends less than 35 feet. Vegetation gaps exceed 30% of the estimated length of the stream on the planning unit.
Right Bank 10 9	8 7	6 5	4 3 2	1 0
Left Bank 10 9	8 7	6 5	4 3 2	1 0
Comments:				

Page 1

Landowner Name: **WA SVAP 2 Field Reference Sheet (Ver 2)**

5. Riparian Area Quality – Rate entire property (Nat'l SVAP2, pg 21) (Natural vegetation means native or naturalized)			
Natural and diverse riparian vegetation with composition, density and age structure appropriate for the site. No invasive species or concentrated flows through area.	Natural and diverse riparian vegetation with composition, density and age structure appropriate for the site. Invasive species present in small numbers (20% cover or less).	Natural vegetation compromised by poor management. Evidence of concentrated flows running through the riparian area. Invasive species common (>20%<50% cover).	Little or no natural vegetation. Evidence of concentrated flows running through the riparian area. Invasive species widespread (>50% cover).
Right Bank 10 9	8 7 6	5 4 3	2 1 0
Left Bank 10 9	8 7 6	5 4 3	2 1 0
Comments:			

6(a). Canopy Cover - *Coldwater* Streams (Nat'l SVA2, pg 24)			
>75% of water surface shaded within the length of the stream in landowner's property.	75% to 50% of water surface shaded within the length of the stream in landowner's property.	49% to 20% of water surface shaded within the length of the stream in landowner's property.	<20% of water surface shaded within the length of the stream in landowner's property.
10 9	8 7 6	5 4 3	2 1 0
Comments:			

7. Water Appearance (Nat'l SVAP2, pg 26)			
Very clear, or clarity appropriate to site (3-6'). No oil sheen on surface; no evidence of metal precipitates in streams.	Slightly turbid, especially after storm event, but water clears rapidly (>1.5-3'); no oil sheen on surface; no evidence of metal precipitates in stream.	Turbid most of the time (0.5-1.5') and/or presence of metal precipitates and/or foam/oil present in slackwater areas.	High turbidity most of the time (<0.5') and/or considerable amount of metal precipitates and/or foam/oil present throughout reach.
10 9 8	7 6 5	4 3 2	1 0
Comments:			

8. Nutrient Enrichment (Nat'l SVAP2, pg 27)			
Clear water along entire reach; little algal growth present.	Fairly clear or slightly greenish water; moderate algal growth on substrates.	Greenish water particularly in slow sections; abundant algal growth, especially during warmer months; and/or slight odor of ammonia or rotten eggs; and/or sporadic growth of aquatic plants within slack water areas.	Pea green color present; thick algal mats dominating stream; and/or strong odor of ammonia or rotten eggs, and/or dense stands of aquatic plants widely dispersed.
10 9	8 7 6	5 4 3	2 1 0
Comments:			

9. Manure or Human Waste Presence (Nat'l SVAP2, pg 28)			
Livestock do not have access to stream; no pipes or concentrated flows discharging animal waste or sewage directly into stream.	Livestock access to stream is controlled and/or limited to small watering or crossing areas; no pipes or concentrated flows discharging animal waste or sewage directly into stream.	Livestock have unlimited access to stream during some portion of the year; manure is noticeable in stream; and/or pipes or concentrated flows discharge treated animal waste or sewage directly into stream	Livestock have unlimited access to stream during entire year; manure is noticeable in stream; and/or pipes or concentrated flows discharge untreated animal waste or sewage directly into stream or in stream.
10 9	8 7 6	5 4 3	2 1 0
Comments:			

Page 2

Landowner Name: **WA SVAP 2 Field Reference Sheet (Ver 2)**

10(a). Pools – *Low-Gradient* Streams (Nat'l SVAP2, pg 29)			
More than 2 deep pools separated by riffles, each with greater than 30% of the pool bottom obscured by depth, wood, or other cover. Shallow pools also present.	One or 2 deep pools separated by riffles, each with greater than 30% of the pool bottom obscured by depth wood, or other cover; at least one shallow pool present.	Pools present but shallow (< 2 times maximum depth of the upstream riffle). Only 10 – 30% of pool bottoms are obscured due to depth or wood cover.	Pools absent, but some slow water habitat is available; no cover discernible. OR Reach is dominated by shallow continuous pools or slow water.
10 9	8 7 6	5 4 3	2 1 0
10(b). Pools – *High-Gradient* Streams (>2%) (Nat'l SVAP2, pg 29)			
More than 3 deep pools separated by boulders or wood, each with greater than 30% of the pool bottom obscured by depth, wood, or other cover. For small streams, pool bottoms may not be completely obscured by depth, but pools are deep enough to provide adequate cover for resident fish. Shallow pools also present.	Two to 3 deep pools, each with greater than 30% of the pool bottom obscured by depth wood, or other cover; at least one shallow pool present. For small streams, pool bottoms may not be completely obscured by depth, but pools are deep enough to provide some cover for resident fish. At least one shallow pool also present.	Pools present but shallow relatively shallow, with only 10 – 30% of pool bottoms obscured by depth or wood cover. For small streams, pool bottoms may not be completely obscured by depth, but pools are deep enough to provide minimal cover for resident fish. No shallow pools present.	Pools absent.
10 9	8 7 6	5 4 3	2 1 0
Comments:			

11. Barriers to Aquatic Species Movement (Nat'l SVAP2, pg 31)			
No artificial barriers that prohibit movement of aquatic organisms during any time of the year.	Physical structures, water withdrawals and/or water quality seasonally restrict movement of aquatic species.	Physical structures, water withdrawals and/or water quality restrict movement of aquatic species *throughout the year*.	Physical structures, water withdrawals and/or water quality prohibit movement of aquatic species.
10	9 8 7	6 5 4 3	2 1 0
Comments:			

12. Fish Habitat Complexity (Nat'l SVAP2, pg 32)				
10 or more habitat features available, at least one of which is considered optimal in reference sites (e.g., large wood in forested streams.)	8 to 9 habitat features available.	6 to 7 habitat features available.	4 to 5 habitat features available.	<4 habitat features available.
10 9	8 7	6 5	4 3	2 1 0

1)Logs, large wood: 2/rch. **2)**Small wood accumulations: 1/rch. **3)**Deep pools: 2/rch. **4)**Secondary pools: 4/rch. **5)**Overhanging veg: 3/rch. **6)**Large boulders: 3/rch if no wood, 2/rch if wood present. **7)**Small boulder clusters: 3/rch. **8)**Cobble riffles: 2/rch. **9)**Undercut banks: 3/rch or 25% of bank area. **10)**Thick root mats: 3/rch. **11)**Macrophyte beds: 1/rch. **12)**Off-channel habitats: 2/rch. **13)**Other locally important habitat features. *(describe in comments field)*

Comments:

13. Aquatic Invertebrate Habitat (Nat'l SVAP2, pg 34)		Subreach= 5x bankfull width		
At least 9 types of habitat present; a combination of wood with riffles should be present and suitable in addition to other types of habitat. (If non-forested stream, consider reference site's optimal habitat type needed for this high score.)	8 to 6 types of habitat; site may be in need of more wood or reference habitat features, and stable wood-riffle sections.	5 to 4 types of habitat present	3 to 2 types habitat present	None to 1 type of habitat present
10 9	8 7 6	5 4	3 2	1 0

1)Logs, large wood: 2/subreach. **2)**Large boulders w/in riffles: 2/subreach if now wood, 1/subreach if wood present. **3)**Small boulder clusters: 2/subreach. **4)**Fine woody debris: 2/subreach. **5)**Overhanging vegetation: 1/subreach. **6)**Cobble riffles: 1/subreach. **7)**Undercut banks: 1/subreach or 25% of bank area. **8)**Pools: no minimum. **9)**Thick root mats: 1/subreach. **10)**Macrophyte beds: 1/subreach. **11)**Other locally important habitat features. *(describe in comments field)*.

Comments:

Page 3

Landowner Name: **WA SVAP 2 Field Reference Sheet (Ver 2)**

14. Aquatic Invertebrate Community (Nat'l SVAP2, pg 36)			
Invertebrate community is diverse and well represented by Group I or intolerant species; One or two species do not dominate	Invertebrate community is well represented by Group II or facultative species, and Group I species are also present; one or two species do not dominate	Invertebrate community is composed mainly of Groups II and III, and/or 1 or 2 species of any group may dominate.	Invertebrate community composition is predominantly Group III species and/or only 1 or 2 species of any group is present and abundance is low
10 9 8	7 6 5	4 3 2	1 0
Comments:			

15. Riffle Embeddedness: Streambed Sediments (Nat'l SVAP2, pg 40)				**ONLY EVALUATE WHERE RIFFLES ARE NATURAL FEATURE IN STREAM**	
Gravel or cobble substrates are <10% embedded.	Gravel or cobble substrates are 10-20%	Gravel or cobble substrates are 21-30%		Gravel or cobble substrates are 31-40%	Gravel or cobble substrates are >40% embedded.
10 9	8 7	6 5		4 3	2 1 0
Comments:					

16. Salinity (if applicable) (Nat'l SVAP2, pg 41)		**MAY APPLY IN IRRIGATED CROPLAND EAST OF CASCADES**	
No wilting, bleaching, leaf burn or stunting of aquatic vegetation, no streamside tolerant vegetation present	Minimal wilting, bleaching, leaf burn, or stunting of aquatic vegetation; some salt-tolerant stream side vegetation.	Aquatic vegetation may show significant wilting, bleaching, leaf burn, or stunting; dominance of salt-tolerant streamside vegetation	Severe wilting, bleaching, leaf burn, or stunting; presence of only salt tolerant aquatic vegetation; most streamside vegetation is salt tolerant
10 9 8	7 6 5	4 3	2 1 0
Comments:			

ELEMENT SCORES		
Element	**Benchmark Score**	**After Treatment Score (Projected or Actual)**
1. Channel Condition		
2. Hydrologic Alteration		
3. Bank Condition		
4. Riparian Area Quantity		
5. Riparian Area Quality		
6. Canopy Cover		
7. Water Appearance		
8. Nutrient Enrichment		
9. Manure or Human Waste		
10. Pools		
11. Barriers to Movement		
12. Fish Habitat Complexity		
13. Aquatic Invert Habitat		
14. Aquatic Invert Community		
15. Riffle Embeddedness		
16. Salinity		
A. Sum of all elements scored		
B. Number of elements scored		
Overall Score (A/B)		

Stream Condition (Circle One)	
1 to 2.9	**Severely Degraded**
3 to 4.9	**Poor**
5 to 6.9	**Fair**
7 to 8.9	**Good**
9 to 10	**Excellent**

Suspected causes for SVAP scores <7:

Recommendations for further assessment or actions:

Additional Information:

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A-4 Biology Technical Note-14

TECHNICAL NOTE

U.S. Department of Agriculture | Natural Resources Conservation Service

Biology - 14 (revised November 2015) | Spokane, Washington

November 20, 2015

Wildlife Habitat Evaluation Guide (WHEG)

This Habitat Evaluation Guide is designed to provide the NRCS planner with a relatively simple and objective method of determining the value of aquatic and terrestrial habitat in an agricultur Evaluation Area. This guide can be used on land where wildlife is a primary objective, or on land (such as forestland) where wildlife is considered to be a secondary objective. This guide can be used to evaluate habitat on different land uses including, cropland & hayland, rangeland, pastureland, upland woodland, riparian areas, and wetlands.

Use this evaluation when providing a Resource Management System (RMS) alternative, or for genera assessment of habitat which supports multiple species. If an Evaluation Area is to be intensively managed for one species such as pollinators or an at-risk fish or wildlife species, use a species-specif habitat assessment.

USE WA SVAP2 for evaluating the overall condition of a wadable stream and its habitat elements.

Evaluate current conditions and, if appropriate, conditions to be expected after applying a management plan (Planned A and Planned B). Management may include conservation practices that will raise the general habitat quality of the area, convert one habitat type to another, change livestock grazing pressure, or alter timber management objectives, etc.

PROCEDURE:

1) Identify all areas in the Evaluation Area as cropland, woodland, rangeland, pasture, hayland, riparian, stream or wetland. If a field contains areas of more than one habitat type, evaluate each area within the field according to the criteria appropriate for the habitat type being assessed. For example, a strip of trees along cropland would be scored in the upland woodland section.

2) If the Evaluation Area has only one field in a landuse, or all fields of same landuse are similar, selec one field at random to represent that landuse. If the Evaluation Area has fields of the same habitat type which are managed differently, inventory each field and compute a weighted average score.

3) Complete this habitat assessment in the field and compute the score for each landuse (habitat type Interpolate between levels as needed. If values for all habitat elements (i.e. questions on the inventor form) of a habitat type are at or above Planning Criteria (PC) level, the habitat score is the sum of the value of each habitat element divided by the sum of highest value possible for each element. If the value for any element of a habitat type are less than PC level, the habitat score is the lowest value achieved for that element, divided by the highest possible value for that element.

Enter Data in cells shaded Yellow.

4) If the total score for any habitat type is below PC, present structural or management alternatives wi
conservation practices that will meet or exceed the PC score for that habitat type. Repeat evaluation
assuming the planned alternative is installed and all elements for that habitat type are above
the PC level. Use the Planned A and Planned B boxes for this procedure.

PLANNING CRITERIA: Habitat quality will meet the following minimum levels:

Cropland & Hayland	50%
Pastureland	50%
Rangeland	60%
Upland Woodland	60%
Riparian Area	70%
Wetland	70%
Stream (SVAP2)	70%

Housekeeping for Excel users: In order to keep the Evaluation Summary Sheet looking clean, type the space bar once in unused boxes. For example, if there is no rangeland in the Evaluation Area, then all the spaces for scores should have one space bar in them to keep the Evaluation Summary Sheet appearing blank for Rangeland. If the delete button is pushed instead, the cells will all show 0% and Below PC. If there is a number in a box and the box needs to be blank please use the space bar.

Please send comments to: rachel.maggi@wa.usda.gov

click above
or rachel.maggi@wa.usda.gov

Cropland & Hayland (PC=50%)

Landowner/operator: _____ Tract #: _____

Evaluator: _____ Acres: _____

Date: _____ Field(s): _____

Distance to Undisturbed Cover

10 = Less than 330 feet.

Present: 8 = 330 feet to 660 feet.

Planned A: 6 = 660 feet to 1320 feet.

Planned B: 4 = 1320 feet to 2640 feet.

2 = Greater than 2640 feet.

Crop Rotation and Plant Cover

Present / Planned A:
8 = Row crop/small grain/grass-legume rotation;
or row crops/small grain/tuber/grass-legume rotation;
or greater than 2.5% of field in winter food plots or tree/shrub planting;
or greater than 10% perennial grassy cover undisturbed during nesting season;
or greater than 10% of cropland fields flooded during waterfowl migration.

Planned B:
6 = Row crop/small grain; or row crop/grass-legume rotation;
or row crop/lentils/ tubers.
or 0.5 to 2.5% of field in winter food plots or tree/shrub planting;
or 2.5 to 10% perennial grassy cover undisturbed during nesting season;
or 2.5 to 10% of cropland fields flooded during waterfowl migration.

4 = Continuous row crop; or small grain/lentils; or small grain/fallow;
or root/tuber crops; or orchards, vineyards and cane berries.

Average Residue on Cropland After Planting

Present: 8 = No-till and not grazed, residue greater than 70%.

Planned A: 7 = No till and not grazed; or residue greater than 50% and not grazed and corn not chopped or removed.

Planned B: 5 = Residue greater than 50%.

4 = Residue 30 to 50%; or food plot, grassy cover, or spring-flooded cropland as in level 6 above for **Crop Rotation**.

1 = Residue less than 30%.

Cropland & Hayland Narrative, PC=50%

Cropland and Hayland is land on which growing crops or producing hay is the primary objective. Forage which is harvested primarily mechanically, such as hay or silage is considered cropland, even if incidental grazing occurs. Score the following under Cropland: Corn and grass silage, mint, alfalfa, and hayland.

	Other Habitat	Cropland	Percent
Calculate your acres here:			
	Acres	Acres	

Distance to Undisturbed Cover

Maximum distance from the approximate center of the evaluation area to a different habitat type with a score at an RMS level or above. This element is intended to determine the maximum distance from the most open area to the nearest protective cover for wildlife. The measurement is to be taken from the point in the cropland or hayland that is farthest from another habitat type that would meet an RMS and is at least one of the following: upland woodland or riparian at least 1% of the evaluation area size **or** rangeland, wetland, or unharvested pastureland at least 2% of the evaluation area size. The perce of area considered to be other habitat can be calculated by dividing the other habitat acres by the acres of cropland or hayland in the Evaluation Area multiplied by 100. See above acreage calculator.

Multiple habitat types can be combined together to total the percentage of different habitat. For example, if the evaluation area is 20 acres, a 0.2 ac wetland and a 0.2 ac woodland can be combined to meet the 2% "other habitat" requirement. If these other habitats were 500 feet away from the center of the cropland and both met an RMS level, the landowner would score an 8.

When using habitats which are not on the landowner's property has undisturbed cover, the evaluator should use best judgement when determining if the off-site habitat meets an RMS.

Crop Rotation and Plant Cover

Crop rotation may be defined as specified plant covers in the field, occurring either sequentially in consecutive seasons or simultaneously in separate areas (strip cropping).

Winter food plot is an area within the cropland field that has been seeded to a wildlife food mix, or crop (corn, milo, etc.), not harvested, and left undisturbed over winter.

Tree/Shrub Planting is an area within the cropland field that has been planted for wildlife with site-adapted trees and shrubs.

Perennial grassy cover is a grassy area within the cropland field that is not grazed, hayed, burned, mowed, tilled or otherwise disturbed during the nesting season. Examples may include field border strips, grassed waterways, critical area plantings or unharvested pastureland that meets an RMS.

Cropland field flooded during spring waterfowl migration is an area within the cropland field where in 3 years out of 5, a grain crop is unharvested, or crop residues are untilled and ungrazed. Cropland will be flooded or ponded to a depth of 3 to 18 inches during ***spring*** waterfowl migration.

Wildlife Water Source

Present / Planned A:
4 = Enhanced water availability in Evaluation Area for wildlife (guzzlers, spring development, wells, livestock exclusion, elimination of agricultural runoff into surface water bodies ,etc.)

2 = Historic water availability in the evaluation area is still present or restored. (Score PC and FW wetlands here)

Planned B: 1 = Historic water source has been detrimentally altered due to human and/or livestock use.

Is there a natural water source present within the Evaluation Area? If so, then please complete the riparian section of this Habitat Evaluation Guide. Do not complete the riparian section if the site did not historically support woody vegetation along the water source.

Average Residue on Cropland After Planting

Compute this score based on the average for all crops in the rotation.

In addition to preventing soil erosion, residue can provide food resources as well as cover benefits for wildlife. A field which has no fall tillage applied or is in permanent grass will provide more food from waste grain or other edible plant material than tilled ground. A permanent grass field will provide higher cover benefits in the form of winter thermal protection and spring nesting cover than those fields where the vegetation is plowed under for the winter.

Wildlife Water Source

A permanent water source is essential for all wildlife species. Besides sustaining life, water can help animals to thermoregulate, preen, and feed. The amount of available water within a given area will strongly affect the diversity and population size of a species. Water will even determine the home range of most animals, defining its shape and size. Many species of wildlife, especially waterfowl, respond to water availability by migration. A permanent, reliable water source is necessary to ensure consistent breeding and rearing on an annual basis. In areas where water is a limiting factor, wildlife use of a particular area can be expanded by creating or enhancing a water source.

Water quality is as important as water quantity in agricultural landscapes where wildlife is a consideration. Decreases in water quality due to nutrient, organic, and chemical runoff, as well as sedimentation, will limit the use of a water source by wildlife. Evaluate water quality according to the quality criteria outlined in the Field Office Technical Guide.

Note:
If there was no historic surface water features present on the evaluation unit, the landowner is at the RMS level, although in areas where water is a limiting factor, every effort should be made to encourage the landowner to develop supplemental watering sites. If there were historical water features present on the site and they have been detrimentally impacted due to human and/or livestock abuse, the landowner will have to correct the problems before an RMS is achieved.

Rangeland (PC=60%)

Landowner/operator: Tract #:

Evaluator: Acres:

Date: Field(s):

Wildlife Food Source

Present: 6 = Greater than 50% palatable plant material.

Planned A: 4 = 25% to 50% palatable plant material.

Planned B: 2 = 10% to 24% palatable plant material.

1 = Less than 10% palatable plant material.

Grazing System

Present: 6 = No livestock use or proper use with prescribed grazing system applied.

Planned A: 4 = Moderate use, with or without prescribed grazing system.

Planned B: 1 = Improper use, with or without prescribed grazing system.

Plant Community

Present: 6 = Vegetation a complex mosaic of desirable plant communities with an interspersion of grasses, forbs, and, where adapted, shrubs and/or trees

Planned A: 4 = Uniform mixture of grasses, forbs and (where adapted) woody plants.

Planned B: 1 = Dominated by 1 or 2 species of grasses and/or woody plants.

Rangeland Narrative, PC=60%

Washington's Priority Species & Habitats Webpage

National Range & Pasture Handbook Webpage

Wildlife Food Source

Hoofed game are not the only wildlife using range. Insects, rabbits, rodents, birds, reptiles, and other wildlife all compete for the available food. When food is adequate in quantity, but of such poor quality that the animals are unable to eat and digest enough to obtain the necessary nutrients, malnutrition will result. It is also important to note that wildlife do not always utilize the most highly nutritious plant material available. Palatable plant materials are anything that are acceptable and nutritious food sources and can include forage, twigs, leaves, seeds, nectar, fruits, roots, etc. Higher plant diversity will also provide greater value to wildlife. Palatable plant material percentage should be estimated by weight or ocular estimate.

Noxious weeds are not a suitable substitute for native plants when planning for a wildlife food source.

Grazing System

If improperly managed, livestock presence can have negative impacts on all habitat elements. These impacts can include, but are not limited to decreases in surface water quality, reduction in plant cover and species diversity, changes in hydrology, soil erosion, and an increase in noxious weeds. When managed properly, livestock can be used as a management tool in areas where invasive vegetation will outcompete native species.

Livestock should be excluded from aquatic habitats and their associated buffer areas.

Plant Community

When planning for wildlife, habitat with diverse plant communities is almost always preferred. Desirable plant communities are those which are not dominated by invasive species.

It is important to remember that the same range habitat can be used by many species during different seasons to complete their lifecycles. Herbaceous vegetation can be a critical cover component for ground-nesting birds in the spring, whereas a woody species in the same community can provide an essential winter food resource for ungulates. Therefore it is essential that plant communities be composed of several different species of each vegetative layer.

Another example is a rangeland community composed primarily of grasses. This community will not provide the structural habitat elements necessary for the striped whipsnake and other reptiles, hairstreak butterfly, sage grouse, small mammals such as the pigmy rabbit, etc. In addition, lack of forb species will limit food resources for small mammals such as the sagebrush vole, yellowbelly marmot, and the mountain cottontail.

Wildlife Water Source

Present: 6 = Enhanced water availability in Evaluation Area for wildlife (guzzlers, spring development, wells, livestock exclusion, elimination of agricultural runoff into surface water bodies, etc.)

Planned A: 4 = Historic water availability in the Evaluation Area is still present or restored.

Planned B: 1 = Historic water source has been detrimentally altered due to human and/or livestock use.

Is there a natural water source present within the Evaluation Area? If so, then please complete the riparian section of this Habitat Evaluation Guide. Do not complete the riparian section if the site did not historically support woody vegetation along the water source.

Wildlife Water Source

A permanent water source is essential for all wildlife species. Besides sustaining life, water can help animals to thermoregulate, preen, and feed. The amount of available water within a given area will strongly affect the diversity and population size of a species. Water will even determine the home range of most animals, defining its shape and size. Many species of wildlife, especially waterfowl, respond to water availability by migration. A permanent, reliable water source is necessary to ensure consistent breeding and rearing on an annual basis. In areas where water is a limiting factor, wildlife use of a particular area can be expanded by creating or enhancing a water source.

Water quality is as important as water quantity in agricultural landscapes where wildlife is a consideration. Decreases in water quality due to nutrient, organic, and chemical runoff as well as sedimentation will limit the use of a water source by wildlife. Evaluate water quality according to the quality criteria outlined in the Field Office Technical Guide.

Note:
If there was no historic surface water features present on the evaluation unit, the landowner is at the RMS level, although in areas where water is a limiting factor, every effort should be made to encourage the landowner to develop supplemental watering sites. If there were historical water features present on the site and they have been detrimentally impacted due to human and/or livestock abuse, the landowner will have to correct the problems before an RMS is achieved.

Pastureland (PC=50%)

Landowner/operator: Tract #:

Evaluator: Acres:

Date: Field(s):

Harvesting System

Present — 4 = Harvested according to prescribed grazing or mechanical forage harvest as a wildlife improvement tool, or left unharvested.

Planned A — 2 = Moderate livestock use, no prescribed grazing system, or no mechanical forage harvest as a wildlife improvement tool.

Planned B — 1 = Improper use, with or without system.

Distance to Undisturbed Cover

Present — 10 = Less than 330 feet.

Planned A — 8 = 330 feet to 660 feet.

Planned B — 6 = 660 feet to 1320 feet.

4 = 1320 feet to 2640 feet.

2 = Greater than 2640 feet.

Plant Diversity

Present — 4 = Vegetation is a complex mosaic of herbaceous plant types with an interspersion of grasses, forbs, species diversity greater than below.

Planned A — 2 = Uniform mixture of grasses, edible forbs, diversity of species moderate, grass species dominated by more than 1 species, **and** forb species are at least 3.

Planned B

1 = Dominated by 1 species of grass, diversity of species low.

Pastureland Narrative, PC=50%

PJ:Rastureland Narrative, PC=50%

Pastureland is land in which the primary use is grazing, although incidental hay or silage harvest may occur. Include grasslands which are not regularly harvested such as wildlife habitat.

Forage which is harvested primarily mechanically, such as hay or silage is considered cropland, even if incidental grazing occurs. Score the following under Cropland: Corn and grass silage, mint, alfalfa, and hayland.

Harvesting System

Proper management of a grass stand will increase its health, which ultimately provides higher quality wildlife food and cover. Pastures which are either over or under-utilized can be less attractive for wildlife. For example, a stand which is allowed to be overgrown with tall sod-forming grass species will eventually outcompete the legumes and other forb species preferred by many species of wildlife. Overgrazing can lead to soil compaction, erosion, and an abundance of unpalatable species.

Calculate your acres here: Other Habitat (Acres) | Cropland (Acres) | Percent

Distance to Undisturbed Cover

Maximum distance from the approximate center of the evaluation area to a different habitat type with a score at an RMS level or above. This element is intended to determine the average distance from the most open area to the nearest protective cover for wildlife. The measurement is to be taken from the point in the pastureland that is farthest from another habitat type that would meet an RMS level or above. Other habitat may be woodland or riparian at least 1% of evaluation area size, **or** rangeland, wetland, or unharvested pastureland (refer to the Harvest Rotation Criteria) at least 2% of evaluation area size. See above acreage calculator.

Multiple habitat types can be combined together to total the percentage of "different habitat". For example, if the evaluation area is 20 acres, a 0.2 ac wetland and a 0.2 ac woodland can be combined to meet the 2% "other habitat" requirement. If these other habitats were 500 feet away from the center of the pasture and both met an RMS level, the landowner would score an 8.

For more information please refer to Cropland Criteria: Distance to Undisturbed Cover.

Wildlife depend on cover to serve many functions including: nesting, escape, hiding and resting areas, and thermal protection. It is critical for wildlife to be able to take cover in diverse vegetation types within a short distance from watering and feeding areas. These undisturbed areas serve as critical edge habitat where the highest number and variety of species can be expected in a particular Evaluation Area.

It is critical that the undisturbed cover types be at a RMS level so that they provide the highest cover benefits possible in a small portion of the overall evaluation area.

When using habitats which not on the landowner's property has undisturbed cover, the evaluator should use best judgement when determining if the off-site habitat meets an RMS.

Harvest Rotation

Present — 8 = A buffer, clump, or strip of grass at least 40 feet in width or 2% of the total pastureland area is left undisturbed during the nesting season, October 1st through July 15th.

Planned A — 6 = A buffer, clump, or strip of *grass* at least 20 feet in width or 1% of the total pastureland area is left during the nesting season, October 1st through July 15th.

Planned B

4 = A buffer, clump, or strip of *vegetation* at least 20 feet in width or 1% of the total pastureland area is left during the nesting season, October 1st through July 15th.

1 = Disturbance throughout the pasture during the nesting season, October 1st through July 15th.

Wildlife Water Source

Present — 4 = Enhanced water availability and water quality on evaluation area for wildlife (guzzlers, spring development, wells, livestock exclusion, elimination of agricultural runoff into surface water bodies,etc.)

Planned A — 2 = Historic water availability on the evaluation area is still present or restored.

Planned B — 1 = Historic water source has been detrimentally altered due to human and/or livestock use.

Is there a natural water source present within the Evaluation Area? If so, then please complete the riparian section of this Habitat Evaluation Guide. Do not complete the riparian section if the site did not historically support woody vegetation along the water source.

Plant Diversity

Pastureland which is composed of many herbaceous plant types provides the largest food selection for a variety of wildlife species. The most desirable pasture stands have a mixture of several grass species and several forb species. Fields which have high interspersion between grass and forb species have the highest utilization by grazing wildlife. For example, a pasture with tall fescue, orchardgrass, white clover, and red clover will provide food for more animal groups than a perennial rye grass pasture.

Noxious weeds are not a suitable substitute for native plants when planning for a wildlife food source.

Harvest Rotation

Undisturbed grassland is a critical element in the success of ground-nesting birds. It is important to provide herbaceous vegetation that is dense enough to facilitate nest-building, camouflage, and thermal protection for both adult and juvenile birds. A less desired, but still functional cover type, is an undisturbed area of woody shrubs and other dense, low-growing vegetation. Vegetation should be left undisturbed in early fall to promote the growth of suitable nesting cover by the spring. Most ground-nesting birds have completed their nesting cycles by mid-July. The planner has the option of planning the total percentage or the minimum width, whichever results in lower acreage.

Wildlife Water Source

A permanent water source is essential for all wildlife species. Besides sustaining life, water can help animals to thermoregulate, preen, and feed. The amount of available water within a given area will strongly affect the diversity and population size of a species. Water will even determine the home range of most animals, defining its shape and size. Many species of wildlife, especially waterfowl, respond to water availability by migration. A permanent, reliable water source is necessary to ensure consistent breeding and rearing on an annual basis. In areas where water is a limiting factor, wildlife use of a particular area can be expanded by creating or enhancing a water source.

Water quality is as important as water quantity in agricultural landscapes where wildlife is a consideration. Decreases in water quality due to nutrient, organic, and chemical runoff as well as sedimentation will limit the use of a water source by wildlife. Evaluate water quality according to the quality criteria outlined in the Field Office Technical Guide.

Note:
If there was no historic surface water features present on the evaluation unit, the landowner is at the RMS level, although in areas where water is a limiting factor, every effort should be made to encourage the landowner to develop supplemental watering sites. If there were historical water features present on the site and they have been detrimentally impacted due to human and/or livestock abuse, the landowner will have to correct the problems before an RMS is achieved.

Upland Woodland (PC = 60%)

Landowner/operator: _____ Tract #: _____

Evaluator: _____ Acres: _____

Date: _____ Field(s): _____

Forest Diversity

Present / *Planned A* / *Planned B*

6 = Diverse mixture of tree heights and diameters, multiple tree species interspersed with diverse understory vegetation (includes evaluation areas where ponderosa pine is the sole climax species).

4 = Diverse mixture of tree height and diameters dominated by 1 or 2 tree species; interspersion and/or understory diversity is low or absent. (Includes evaluation areas where ponderosa pine is the sole climax species.)

2 = Uniform stand height and diameters with more than 80% stocking of 1 or 2 tree species.

Grazing System

Present / *Planned A*

6 = No livestock use or proper use with prescribed grazing system applied.

4 = Moderate use, no prescribed grazing system.

2 = Improper use, with or without system.

Downed Woody Material

Present / *Planned A* / *Planned B*

6 = Five logs per acre that are a minimum 12 inches in diameter and greater than 20 feet in length. For optimal benefit the log should have some of its limbs and bark remaining.

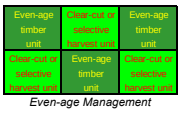
4 = Three logs per acre that are a minimum 12 inches in diameter and greater than 20 feet in length, or some of the logs missing limbs or losing bark.

2 = Less than three logs per acre that are a minimum 12 inches in diameter and greater than 20 feet or logs present are in late stages of decay and no longer possess limbs or retain any bark.

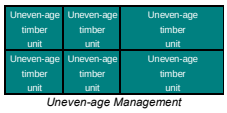
Upland Woodland Narrative, PC=60%

Forest Diversity

A diverse mixture of tree species, heights, and diameters is more valuable to wildlife than uniform stands. Understory vegetation is more likely to be present in areas without the dense canopy caused by a monoculture. In naturally functioning forest ecosystems, insects, disease, fire, and windthrow damage all contribute to create a multi-aged stand consisting of many species of trees, shrubs and herbaceous vegetation. In forests managed for timber harvesting, even-aged trees which are periodically harvested by clearcutting or selective thinning prove to be the most efficient method of production. However, this practice results in low tree species diversity within stands, while maintaining maximum plant diversity between stands. Uneven growth stage management targets establishment of several tree layers in the stand which results in maximum diversity within stand structure, but minimum between stand diversity. This management regime reduces wildlife habitat because the large openings and edge which is necessary for understory production is low or missing. For maximum habitat benefits, both the even-age and uneven-age management strategies should be implemented. This will allow maximum wildlife utilization of the tract due to the development of forest openings, edge, stand structure and understory vegetation.



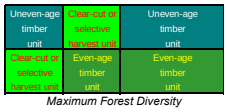
Even-age Management



Uneven-age Management

Grazing System

Natural understory vegetation provides little livestock forage. Livestock grazing can affect tree health, soil compaction, erosion, and understory vegetation composition. Consider incorporating only a small portion of a woodlot into a pasture; this will provide livestock shade and shelter from adverse weather without jeopardizing the entire stand.



Maximum Forest Diversity

National Forestry Manual Webpage

Downed Woody Material

Downed wood enhances wildlife habitat by providing sites for feeding, resting, reproduction, and travel routes. Decomposing wood on the forest floor is a habitat element for forest birds, small mammals, reptiles and amphibians, and invertebrates. In addition, woody material on the ground provides sites for nitrogen fixation and nutrient cycling, moisture regimes for establishment of seedlings, and mycorrhizal fungi growth mediums. *Logs which have begun decomposition but still retain branches and bark are the most beneficial for wildlife.*

If downed woody material is identified as a missing component, consult a wildlife biologist before planning to the RMS level. Utilization of onsite material may be a conflict with local or state forest harvest regulations.

Note: When determining downed woody material and snag densities utilize a sampling method which closely estimates the actual numbers. Do not attempt to count all the snags in a 100 acre plot, for example, sample five, 1 acre plots, and divide by five to get a per acre estimate.

Snags *(Snags must meet both diameter and height requirements to be considered)*

Present / *Planned A* / *Planned B*

8 = More than 4 snags, greater than 20 inch dbh and 60 feet height per acre. Snags will have at least 50% of bark loosened yet affixed to the trunk.

7 = Two to four snags more than 20 inch dbh and/or 5 snags 8-20 inch dbh and a minimum height of 20 feet, per acre. *(No bark requirement)*

6 = Three to five snags per acre 6-12 inch dbh and a minimum height of 10 feet.

1 = No snags or snags less than 6 inch dbh.

Brush Piles

Present / *Planned A* / *Planned B*

6 = One brushpile per 5 acres. Minimum size must be 10 feet in diameter and at least 6 feet in height. The pile should be located within 200 feet of other cover and must be located within 1000 feet of a water source.

4 = One brushpile per 10 acres. Minimum size as above. The pile is more than 200 feet from other cover, but less than 1000 feet from a water source.

1 = No brushpiles present within the Evaluation Area, or brushpiles greater than 1000 feet from a water source.

Forest Openings

Present / *Planned A* / *Planned B*

6 = Irregularly shaped openings well interspersed throughout the stand, with mixtures of grasses, forbs, and shrubs, occupying 5-33% of the total area and none more than 750 feet across.

4 = Openings with at least three sides and mixtures of grasses, forbs, and shrubs occupying 5-33% of total area, none more than 1500 feet across.

2 = Few openings that meet above criteria on less than 5% of area.

1 = No openings meeting above criteria, or larger than 1500 feet across and/or occupying more than 33% of the forest.

Wildlife Water Source

Present / *Planned A* / *Planned B*

6 = Enhanced water availability and water quality on evaluation area for wildlife (guzzlers, spring development, wells, livestock exclusion, elimination of agricultural runoff into surface water bodies,etc.)

4 = Historic water availability on the Evaluation Area is still present or restored.

1 = Historic water source has been detrimentally altered due to human and/or livestock use.

Is there a natural water source present within the Evaluation Area? If so, than please complete the riparian section of this Habitat Evaluation Guide.

Snags

Snags are utilized for their associated foraging, nesting, roosting, and perching values. Snags which have loosened bark provide nesting and forage for a large number of species because of decayed heartwood. To mimic natural forest conditions, snags of varying tree species, ages and decay stages should be encouraged. Snags can be created by killing live trees using various techniques including herbicide treatments, topping, girdling, high-cut and inoculation with fungal rots. **These techniques have varied costs, success rates, and risk to human and forest health. Careful evaluation of these factors should be performed before selecting a technique.**

Brush Piles

Wildlife values provided by brush piles include the following: concealment, escape and protective cover from adverse weather conditions, and food provided by insect and other invertebrate colonization. Brushpiles in recent cuts are of particular importance, allowing the use of the habitat before vegetation has regrown. Location of brush piles is also important. They should be on the edge or within a couple hundred feet of feeding and/or watering areas, or along travel lanes. By placing them at intervals between water and feeding areas it is possible to create travelways, improving wildlife use. Make sure brushpiles have some space within for movement, while still providing protection from predators.

Caution should be used in areas where brush piles may harbor disease agents and insect pests such as the bark beetle.

Forest Openings

Canopy openings in dense forest are critical for herbaceous understory growth. Openings may include infrequently used forest roads, meadows, clear-cut areas, cropland, pastureland, and other areas which promote the growth of grasses and forbs or a combination of these features. Additionally, irregular shaped openings increase the amount of edge which is important to wildlife.

Note: Talus slopes are composed of dislodged rock fragments that accumulate at the base of steep slopes or cliffs. They are considered to be a priority habitat by the Washington Department of Fish & Wildlife, however, they do not provide the herbaceous understory growth desired under this category. For this reason do not include them in making Forest Opening calculations. For example if a tract is 160 acres in size and 60 acres of it are talus slope, then base the Woodland calculations on 100 acres.

Wildlife Drinking Water

A permanent water source is essential for all wildlife species. Besides sustaining life, water can help animals to thermoregulate, preen, and feed. The amount of available water within a given area will strongly affect the diversity and population size of a species. Water will even determine the home range of most animals, defining its shape and size. Many species of wildlife, especially waterfowl, respond to water availability by migration. A permanent, reliable water source is necessary to ensure consistent breeding and rearing on an annual basis. In areas where water is a limiting factor, wildlife use of a particular area can be expanded by creating or enhancing a water source.

Water quality is as important as water quantity in agricultural landscapes where wildlife is a consideration. Decreases in water quality due to nutrient, organic, and chemical runoff as well as sedimentation will limit the use of a water source by wildlife. Evaluate water quality according to the quality criteria outlined in the Field Office Technical Guide.

See note in Pastureland also.

Riparian Area (PC = 70%)

Landowner/operator: | Tract #: | Field(s):

Evaluator: | Width: Left Bank | Right Bank Feet

Length: Feet

Date: | Acres:

Riparian Buffer Width

Left Bank	Right Bank	
		4 = The *average* width of the riparian vegetation around or along the natural water source is greater than 100 feet or covers the entire active floodplain.
Present	*Present*	
Planned A	*Planned A*	3 = The minimum width of the riparian vegetation around or along the water source is equal to or greater than 50 feet.
Planned B	*Planned B*	

1 = Riparian vegetation around or along the water source is absent.

Site Index Height Soil Type:

Tree Species: | Height: Feet

		5 = Existing tree species have potential to reach 75-100% of the site index height for the soil type.
Present	*Present*	4 = Existing tree species have potential to reach 50-74% of the site index height for the soil type.
Planned A	*Planned A*	
Planned B	*Planned B*	3 = Existing tree species have potential to reach 25-49% of the site index height for the soil type.

1 = Existing tree species have potential to reach less than 25% of the site index height for the soil type.

Riparian Buffer Length

Gaps are defined as linear portions of the buffer where the buffer width measures less than 50 feet.

Present	*Present*	
Planned A	*Planned A*	5 = Natural plant community generally contiguous, gaps in the buffer do not exceed 10% on the planning unit.
Planned B	*Planned B*	

4 = Gaps in the buffer are 30% or less along the entire planning unit.

3 = Gaps in the buffer exceed 30% along the entire planning unit.

1 = Natural riparian plant community is absent on the planning unit.

Grazing System

		4 = No livestock use
Present	*Present*	3 = Proper use with a prescribed grazing system applied.
Planned A	*Planned A*	2 = Moderate use, with or without prescribed grazing system.
Planned B	*Planned B*	1 = Improper use, with or without system.

Plant Community

		4 = Diverse mixture of tree heights and diameters, mixed tree species interspersed with diverse understory vegetation. (Includes Evaluation Areas where ponderosa pine is the sole climax species.)
Present	*Present*	
Planned A	*Planned A*	3 = Diverse mixture of tree height and diameters dominated by 1 or 2 tree species; interspersion and/or understory diversity is low or absent. (Includes EA's where ponderosa pine is the sole climax species.)
Planned B	*Planned B*	

1 = Uniform height and diameters dominated by 1 or 2 tree species.

Snags *(Snags must meet both diameter and height requirements to be considered)*

		8 = More than 4 snags, greater than 20 inch dbh and 60 feet height per acre. Snags will have at least 50% of bark loosened yet affixed to the trunk.
Present	*Present*	
Planned A	*Planned A*	7 = Two to four snags more than 20 inch dbh and/or 5 snags 8-20 inch dbh and a minimum height of 20 feet, per acre. *(No bark requirement)*
Planned B	*Planned B*	

6 = Three to five snags per acre 6-12 inch dbh and a minimum height of 10 feet.

1 = No snags or snags less than 6 inch dbh.

Downed Woody Material

		4 = Five logs per acre that are a minimum 12 inches in diameter and greater than 20 feet in length. For optimal benefit the log should have some of its limbs and bark remaining.
Present	*Present*	
Planned A	*Planned A*	3 = Three logs per acre that are a minimum 12 inches in diameter and greater than 20 feet in length, or some of the logs missing limbs or losing bark.
Planned B	*Planned B*	

1 = Less than three logs per acre that are a minimum 12 inches in diameter and greater than 20 feet or logs present are in late stages of decay and no longer possess limbs or retain any bark.

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Riparian Area Narrative, PC=70%

Riparian forest habitat includes the area beginning at the ordinary high water line and extends to that portion of the terrestrial landscape that directly influences the aquatic ecosystem by providing shade, fine and large woody material, nutrients, organic and inorganic debris and terrestrial insects. This is also important habitat for wildlife. The riparian forest habitat area encompasses the entire extent of vegetation adapted to wet conditions as well as adjacent upland forest communities that directly influence the stream or wetland system.

Left bank and right bank are to be determined by looking downstream.

Riparian Forest Width
The quality of the riparian zone increases with width and structural complexity of the vegetation within it. A separate streambank analysis for riparian width should occur for both sides of the stream. This will allow for differences in management activities on either side of the stream or for changes in ownership. For example: if a property line runs down the center of the stream, then it may be appropriate to only evaluate one side.

Ditches which contain salmonids will need to have the riparian area section completed.

Site Index Height
The presence of trees which can achieve the site index height have the greatest opportunity to provide shade and thermal buffering to the stream, lake or wetland. Thermal buffering is especially critical to stream habitat during the summer because it provides shade to keep water cool, which increases dissolved oxygen, and limits algal and submerged vegetative growth. In winter, riparian areas with a coniferous element can also prevent streams from freezing.
1. Determine soil type of the site.
2. Determine site index species and potential height.
3. Inventory woody vegetation (shrubs and trees) present on the site and their potential heights.
4. Determine if current woody vegetation heights have the potential to reach the height in step #2.

If the site will not support site index species as listed in the soil survey, alternative species can be planted which have the potential to reach similar heights. If the soil does not have a site index species, determine the tallest tree (preferably conifer but deciduous ok) that would grow on the soil.

Riparian Buffer Length
The quality of a riparian area increases with the width, complexity, and linear extent of its vegetation along a stream.

Conclusion: This example would not meet Planning Criteria because the Gap in the buffer is more than 30% of the total (400 ft Gap / 1000 ft total buffer length = 40%). 40% is more than the 30% allowable.

Grazing System

If improperly managed, livestock presence in aquatic habitats can have negative impacts on all habitat elements. These impacts can include, but are not limited to decreases in surface water quality, reduction in plant cover and species diversity, changes in hydrology, and soil erosion. To ensure the long term habitat sustainability, livestock should be excluded from aquatic habitats and their associated buffer areas.

When managed properly, livestock can be used as a management tool in areas where invasive vegetation will outcompete native species.

Plant Community

A diverse mixture of tree species, heights, and diameters is more valuable to wildlife than uniform stands. In natural functioning riparian ecosystems, insects, disease, flooding, fire, erosion, and windthrow damage all contribute to creating a mixed stand. Where sufficient hydrology exists, natural riparian communities contain several species of trees, shrubs, and herbaceous vegetation. Riparian areas should have multiple canopy layers which will provide varied habitat niches for many species of wildlife. *An exception to multiple canopy layers is ponderosa pine forests where understory growth can be highly variable.*

Snags
Snags are utilized for their associated foraging, nesting, roosting, and perching values. Snags which have loosened bark provide nesting and forage for a large number of species because of decayed heartwood. To mimic natural riparian conditions, snags of varying tree species, ages and decay stages should be encouraged. Snags can be created from killing live trees using various techniques including herbicide treatments, topping, girdling, high-cut and inoculation with fungal rots*. Snags also play a key role in large woody debris recruitment into surface water.

***These techniques have varied costs, success rates, and risk to human and forest health. Careful evaluation of these factors should be preformed before selecting a technique.**

If woody vegetation is planned on a site that is currently without, evaluate future snag density based on the potential for these trees to naturally become snags. A landowner can meet an RMS for snags by planting trees which have the potential to meet the RMS size criteria.

Bird boxes are not a substitute for long term snag production.

When evaluating this element, count all snags which are within the riparian area as defined in the riparian width question. For example, if the landowner currently has a 5 foot riparian buffer and they need to increase the buffer to 25 feet to meet local regulations (RMS level), evaluate all snags within 25 feet of the waterbody.

Downed Woody Material
Downed wood enhances wildlife habitat by providing sites for feeding, resting, reproduction, and travel routes. Decomposing wood on the riparian forest floor is a habitat element for birds, small mammals, reptiles, amphibians, and invertebrates. In addition, woody material on the ground provides sites for nitrogen fixation and nutrient cycling, moisture regimes for establishment of seedlings and mycorrhizal fungi growth mediums. *Logs which have begun decomposition but still retain branches and bark are the most beneficial for wildlife*. An additional function for downed wood is its potential to be transported into the stream channel by overland movement from flood water or by falling directly into the stream to become large woody debris. Large woody debris serves several important instream functions which are discussed in the Instream portion of this Habitat Guide. If downed woody material is identified as a missing component, consult a wildlife biologist before planning to the RMS level. Utilization of onsite material may be a conflict with local or state forest harvest regulations.

Note: When determining downed woody material and snag densities utilize a sampling method which closely estimates the actual numbers. Do not attempt to count all the snags in a 100 acre plot, for example, instead sample five, 1 acre plots, and divide by five to get a per acre estimate.

Wetland (PC = 70%)

Landowner/operator: _____ Tract #: _____

Evaluator: _____ Acres: _____

Date: _____ Field(s): _____

Water Regime

Present / *Planned A* / *Planned B*

4 = Natural surface or subsurface flow patterns are not adversely altered by human and/or livestock disturbance.

3 = Natural surface or subsurface flow patterns altered by human and/or livestock disturbance, but hydrology functioning on its own.

1 = Natural surface or subsurface flow patterns are severely altered by disturbance. Seldom saturated at or near the surface. Obvious shift to less water-dependant plants in vegetative community.

Plant Diversity

Present / *Planned A* / *Planned B*

5 = Multiple species of emergent, aquatic, or woody vegetation or a combination of community types. Vegetation is well interspersed with open water.

4 = Multiple species of emergent, aquatic, or woody vegetation or a a combination of communities. Vegetation is poorly interspersed with open water.

3 = Two or three dominant species of any community type well interspersed with open water.

2 = Two or three dominant species of any community type poorly interspersed with open water.

1 = One dominant species of plant, whether interspersed with open water or not.

Wetland Narrative, PC=70%

Water Regime

Examples of human disturbance which can cause hydrologic alterations include: drain tile, ditches, filled areas, roads, improperly placed culverts, land leveling, overgrazing, stream down-cutting, deforestation, etc.

In some cases, the disturbance may not be drastic enough to cause significant changes in hydrology. In some cases, hydrology can still exist even though drainage control has been implemented in the past. Examples: old drain tile, poorly maintained ditches, breached dikes.

An RMS can be achieved by making small changes to restore hydrology (i.e. installing a seasonal water control structure, partially filling a ditch or removing a section of drain tile). The highest category can be attained by making drastic changes to restore hydrology (i.e. filling entire ditch, removing entire underground drainage system, recreating natural topography).

One method of analyzing shifts in wetland hydrology is to study plant community composition. Use other wetlands within the same drainage area as a reference to determine if the plants currently found on the site are less water dependent then those which would have been found historically.

Historical	→	Current
cattails, bulrushes, sedges	→	soft rush, reed canarygrass, buttercup, Douglas spirea
sedges, rushes, bulrushes	→	red alder, Douglas spirea, Douglas fir
sedges, rushes, bulrushes	→	velvetgrass, buttercup, soft rush
smartweed, bulrush, cattail, burreed, spikerush	→	red-osier dogwood, willow, black hawthorn
red-osier dogwood, willow, black cottonwood	→	Douglas fir, snowberry
sedges, rushes, bulrushes	→	tall wheatgrass
sedges, rushes, quaking aspen, willow	→	reed canarygrass

These are only examples; there are other plant community shifts possible. When planning wetland restoration or enhancement, the communities listed above under "Historical" may not be the desired future plant community.

Grazing System

Present / *Planned A* / *Planned B*

4 = No livestock use

3 = Proper use with a prescribed grazing system applied.

2 = Moderate use, no prescribed grazing system.

1 = Improper use, with or without system.

Please complete the riparian section of this Habitat Evaluation Guide.

Evaluate water quality according to the quality criteria outlined in the Field Office Technical Guide.

Plant Diversity

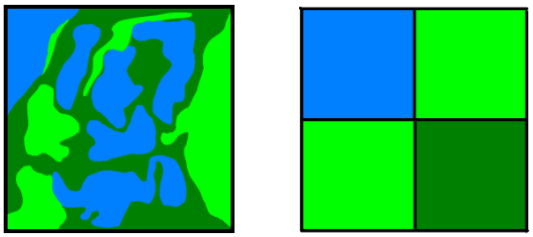
When planning for wildlife, habitat with diverse plant communities is almost always preferred. The Plant Diversity section of the Wetland Evaluation is designed to consider this characteristic of wetlands. Additionally, this section addresses the interspersion of diverse plant communities with water. Interspersion may be defined as erratically distributed throughout. *Some water must be present throughout the year*.

Emergent vegetation includes non-woody vegetation such as cattails, grasses, sedges, rushes, bulrushes, and certain forbs.

Aquatic vegetation grows in open water and can be either floating or submerged. Some examples include water lilies, pondweed, and duckweed. *Algae is not considered aquatic vegetation.*

Woody vegetation includes shrubs and trees, such as spirea, salmonberry, willow, and alder.

Well Interspersed ***Poorly Interspersed***



Herbaceous vegetation

Water

Woody vegetation

Grazing System

If improperly managed, livestock presence in aquatic habitats can have negative impacts on all habitat elements. These impacts can include, but are not limited to decreases in surface water quality, reduction in plant cover and species diversity, changes in hydrology, and soil erosion. To ensure the long term habitat sustainability, livestock should be excluded from aquatic habitats and their associated buffer areas.

When managed properly, livestock can be used as a management tool in areas where invasive vegetation will outcompete native species.

Stream (PC = 70%)

Landowner/operator: _____ Tract #: _____

Evaluator: _____ Acres _____

Stream Name: _____ Stream Length: _____ *Feet*

Tributary to: _____ Stream Width: _____ *Feet*
Bankfull

Date: _____ Flow Rate: _____ Field(s): _____
High, Medium, Low

Complete WA SVAP2 Riparian Elements Field Data Sheet (Ver 1)

Present Overall Score = _____ Percentage = %

Condition = _____

1 to 2.9	Severely Degraded	
3 to 4.9	Poor	
5 to 6.9	Fair	
7 to 8.9	Good	PC level
9 to 10	Excellent	

Planned A Overall Score = _____ Percentage = %

Condition = _____

1 to 2.9	Severely Degraded	
3 to 4.9	Poor	
5 to 6.9	Fair	
7 to 8.9	Good	PC level
9 to 10	Excellent	

Planned B Overall Score = _____ Percentage = %

Condition = _____

1 to 2.9	Severely Degraded	
3 to 4.9	Poor	
5 to 6.9	Fair	
7 to 8.9	Good	PC level
9 to 10	Excellent	

Comments:

Fish & Wildlife Habitat Evaluation Summary

Landowner/operator: Date:

Evaluator: Tract: Field(s):

*P.C. = Planning Criteria

Cropland & Hayland (PC = 50%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Distance to undisturbed cover						
Crop rotation and plant residue cover						
Average residue on cropland after planting						
Wildlife drinking water						
Acres: 0.0 Score:						

Rangeland (PC = 60%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Wildlife food source						
Grazing system						
Plant community						
Wildlife drinking water						
Acres: 0.0 Score:						

Pastureland (P.C = 50%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Harvesting system						
Distance to undisturbed cover						
Plant diversity						
Harvest rotation						
Wildlife drinking water						
Acres: 0.0 Score:						

Upland Woodland (PC = 60%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Forest diversity						
Grazing system						
Downed woody material						
Snags						
Brush piles						
Forest openings						
Wildlife drinking water						
Acres: 0.0 Score:						

Riparian (*Left bank*) (PC = 70%)

	Present	P.C.*	Planned A	P.C.	Planned B	P.C.*
Riparian width						
Site Index Height						
Bank stability						
Grazing system						
Plant community						
Snags						
Downed woody material						
Acres: Score:						

Riparian (*Right bank*) (PC = 70%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Riparian width						
Site Index Height						
Bank stability						
Grazing system						
Plant community						
Snags						
Downed woody material						
Acres: Score:						

Wetland (PC = 70%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Water regime						
Plant diversity						
Grazing system						
Acres: 0.0 Score:						

Stream (PC = 70%)

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
SVAP2 Overall Condition Score						

	Present	P.C.*	Planned A	P.C.*	Planned B	P.C.*
Acres: 0.0 Score:						

Planning Unit Summary

Present Condition:

Habitat Type	Score		Acres		Weighted Score		Evaluation Area Score
Cropland & Hayland		x	0.0	=			
Rangeland		x	0.0	=			
Pastureland		x	0.0	=			
Upland Woodland		x	0.0	=			
Riparian (Left Bank)		x		=			
Riparian (Right Bank)		x		=			
Wetland		x	0.0	=			
Stream		x	0.0	=			
Totals			0.0		0.00	=	*Present Condition*

Planned A Condition:

Habitat Type	Score		Acres		Weighted Score		Evaluation Area Score
Cropland & Hayland		x	0.0	=			
Rangeland		x	0.0	=			
Pastureland		x	0.0	=			
Upland Woodland		x	0.0	=			
Riparian (Left Bank)		x		=			
Riparian (Right Bank)		x		=			
Wetland		x	0.0	=			
Stream		x	0.0	=			
Totals			0.0		0.00	=	*Planned A*

Planned B Condition:

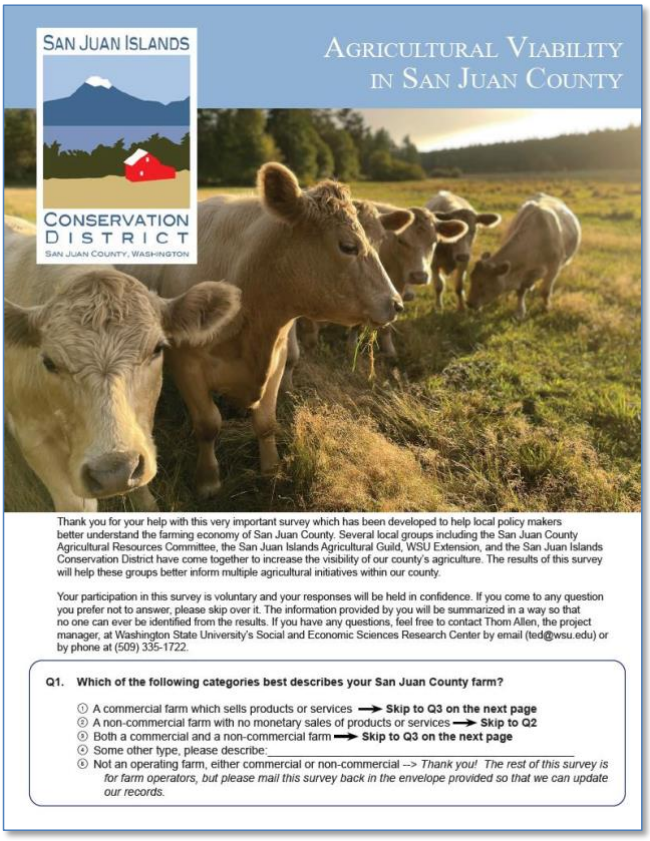
Habitat Type	Score		Acres		Weighted Score		Evaluation Area Score
Cropland & Hayland		x	0.0	=			
Rangeland		x	0.0	=			
Pastureland		x	0.0	=			
Upland Woodland		x	0.0	=			
Riparian (Left Bank)		x		=			
Riparian (Right Bank)		x		=			
Wetland		x	0.0	=			
Stream		x	0.0	=			
Totals			0.0		0.00	=	*Planned B*

Notes:

4.

Survey Instruments

2023 Questionnaire



SAN JUAN ISLANDS CONSERVATION DISTRICT
SAN JUAN COUNTY, WASHINGTON

AGRICULTURAL VIABILITY IN SAN JUAN COUNTY

Thank you for your help with this very important survey which has been developed to help local policy makers better understand the farming economy of San Juan County. Several local groups including the San Juan County Agricultural Resources Committee, the San Juan Islands Agricultural Guild, WSU Extension, and the San Juan Islands Conservation District have come together to increase the visibility of our county's agriculture. The results of this survey will help these groups better inform multiple agricultural initiatives within our county.

Your participation in this survey is voluntary and your responses will be held in confidence. If you come to any question you prefer not to answer, please skip over it. The information provided by you will be summarized in a way so that no one can ever be identified from the results. If you have any questions, feel free to contact Thom Allen, the project manager, at Washington State University's Social and Economic Sciences Research Center by email (ted@wsu.edu) or by phone at (509) 335-1722.

Q1. Which of the following categories best describes your San Juan County farm?

① A commercial farm which sells products or services ➟ **Skip to Q3 on the next page**
② A non-commercial farm with no monetary sales of products or services ➟ **Skip to Q2**
③ Both a commercial and a non-commercial farm ➟ **Skip to Q3 on the next page**
④ Some other type, please describe:_____
⑤ Not an operating farm, either commercial or non-commercial --> *Thank you! The rest of this survey is for farm operators, but please mail this survey back in the envelope provided so that we can update our records.*

Q2. [For non-commercial farms only] Do you have any plans to become a commercial farm within the next 5 years?

① Yes
② No
③ Maybe or unsure

Q3. Which of the following best describes your role on the farm?

① I am the owner and manager of the farm
② I am the owner of the farm, but it is managed or leased to someone else
③ I manage or lease the farm, but do not own it
④ I am an employee of the farm
⑤ Some other arrangement. Please describe:_____

Q4. Are you the primary operator of your San Juan County farm?

① Yes ➔ How many years have you been the primary operator of this farm? _____ years
② No

Q5. [For commercial farms only] (A) Which of the following did you use to market your San Juan County agricultural products in 2022, and (B) for those you used, what percentage (in terms of monetary value) of your products in 2022 were marketed in each way? *Please provide a response to both columns A and B for each row. The total should add to 100%.*

Ways to market San Juan County agricultural products	A. Did you use this in 2022? Yes	No	B. What percentage of your products?
Farmer's market	①	②	_____ %
San Juan County food cooperatives	①	②	_____ %
Off-island food cooperatives	①	②	_____ %
Community Support Agriculture (CSA)	①	②	_____ %
San Juan County restaurants	①	②	_____ %
Off-island restaurants	①	②	_____ %
San Juan County grocery stores	①	②	_____ %
Off-island grocery stores	①	②	_____ %
Farm stands	①	②	_____ %
Web-based sales	①	②	_____ %
Direct to customer list	①	②	_____ %
San Juan County food banks	①	②	_____ %
Puget Sound Food Hub	①	②	_____ %
San Juan Islands Food Hub	①	②	_____ %
Livestock auction	①	②	_____ %
San Juan County schools or institutions	①	②	_____ %
Other methods. Please describe: _____	①	②	_____ %
			Total 100%

2

Q6. Of the agricultural products that you produced in 2021 and 2022 on your San Juan County farm, what percentage was for each of the following? *Please provide a response to both columns A and B for each row. The totals for each column should add to 100%*

	A. 2021	B. 2022
Sale	_____ %	_____ %
Home consumption	_____ %	_____ %
Charitable donation	_____ %	_____ %
Other. Please describe: _____	_____ %	_____ %
	Total 100%	**Total 100%**

Q7. [If you donated crops in either 2021 or 2022] What is the estimated value of the agricultural products from your farm that you donated?

$_____value of donated crops in 2021

$_____value of donated crops in 2022

Q8. [If you donated crops in either 2021 or 2022] Did you donate agricultural products from your San Juan County farm in either 2021 or 2022 to any of the following?

	Yes	No
School	①	②
Senior Services/Senior Center	①	②
Grow a Row	①	②
Church	①	②
Gleaning Program	①	②
Summer Nutrition Program/Weekend Meals for Kids	①	②
Neighbors	①	②
Something else. Please describe: _____	①	②

Q9. [If you sold crops in either 2021 or 2022] Of the San Juan County agricultural crops that you produced for sale in 2021 and 2022, what percentage were you able to sell?

	0% (none)	1% to 24%	25% to 49%	50% to 74%	75% to 99%	100% (all)
2021	①	②	③	④	⑤	⑥
2022	①	②	③	④	⑤	⑥

Q10. Is there anything you would like to comment on regarding selling your agricultural products?

3

Q11. In your opinion, over the past two years, how much of a challenge has it been for farms in San Juan County to GAIN ACCESS to each of the following?

	Extreme challenge	Challenge	Moderate challenge	Slight challenge	Not a challenge	Does not apply
Farm machinery	1	2	3	4	5	6
Water	1	2	3	4	5	6
Hiring farm workers	1	2	3	4	5	6
Farm worker housing	1	2	3	4	5	6
Season extension infrastructure	1	2	3	4	5	6
Storage capacity	1	2	3	4	5	6
Markets	1	2	3	4	5	6
Value added processing facilities	1	2	3	4	5	6
Capital/funds	1	2	3	4	5	6
Affordable farmland	1	2	3	4	5	6
Farm management expertise or training	1	2	3	4	5	6
Business planning expertise or training	1	2	3	4	5	6

Q12. In your opinion, over the past two years, how much of a challenge has THE COST of each of these been for farms in San Juan County?

	Extreme challenge	Challenge	Moderate challenge	Slight challenge	Not a challenge	Does not apply
Inputs	1	2	3	4	5	6
Skilled farm labor	1	2	3	4	5	6
Farm worker housing	1	2	3	4	5	6
Farm infrastructure	1	2	3	4	5	6
Season extension infrastructure	1	2	3	4	5	6
Cost of transportation	1	2	3	4	5	6

Q13. In your opinion, over the past two years, how much of a challenge has each of these OTHER ISSUES been for farms in San Juan County?

	Extreme challenge	Challenge	Moderate challenge	Slight challenge	Not a challenge	Does not apply
Food safety regulation	1	2	3	4	5	6
Land use regulation	1	2	3	4	5	6
Transportation reliability	1	2	3	4	5	6
Availability of compost	1	2	3	4	5	6
Extreme weather events	1	2	3	4	5	6
Other issues. Please describe: _____	1	2	3	4	5	6

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Q14. Do you plan to maintain, expand, or decrease the scope of your operation within the next five years?

① Maintain → **Skip to Q16**
② Expand
③ Decrease → **Skip to Q16**
④ Not sure → **Skip to Q16**

Q15. If you were to expand the scope of your operation, how much need would you have in each of the following areas?

	Definite need	Moderate need	No need	Not sure
Access to more land	①	②	③	④
Access to water	①	②	③	④
Access to farm machinery/equipment	①	②	③	④
Additional labor	①	②	③	④
Farmworker housing	①	②	③	④
Access to reliable markets	①	②	③	④
Increased means of distribution	①	②	③	④
Access to USDA meat processing (cut and wrap)	①	②	③	④
Access to custom slaughter and meat processing	①	②	③	④
Access to other value added processing facilities (increased processing capacity)	①	②	③	④
Cold storage capacity	①	②	③	④
Dry storage capacity	①	②	③	④
Season extension infrastructure	①	②	③	④
More capital	①	②	③	④
Business plan support	①	②	③	④
Farm plan support	①	②	③	④
Grant support	①	②	③	④
Something else. Please specify:_____	①	②	③	④

Q16. Do you have a business plan for your farm?

① Yes
② No → **Skip to Q18**
③ Not sure → **Skip to Q18**

Q17. How often do you update your business plan?

① Never
② Less often than once every 5 years
③ Every 1-5 years
④ Once per year (annually)
⑤ More often than once per year

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Q18. Have you ever worked with the San Juan Islands Conservation District or NRCS to develop a Farm Plan or Individual Stewardship Plan?

① Yes → In what year as the plan developed? _____ *year* → **Skip to Q20**
② No
⑨ Not sure

Q19. How interested or not interested are you to work with the Conservation District to develop an Individual Stewardship Plan?

① Very interested
② Somewhat interested
③ Not interested

Q20. Do you own outright (without a mortgage) any of the land in San Juan County that you farmed from 2020-2022? *Do not include land you leased to others.*

① Yes
② No → **Skip to Q22**

Q21. Of the land you own outright (without a mortgage) in San Juan County, how many acres did you farm in each of the three most recent years, 2020-2022?

2020	_____ farmed acres owned outright
2021	_____ farmed acres owned outright
2022	_____ farmed acres owned outright

Q22. Do you own with a mortgage any of the San Juan County land you farmed from 2020-2022? *Do not include land you leased to others.*

① Yes
② No → **Skip to Q24**

Q23. Of the acres you own with a mortgage in San Juan County, how many did you farm in each of the three most recent years, 2020-2022, and what was the average cost of the mortgage per acre each year? *Please provide a response to both columns A and B for each row.*

	A. Farmed acres with a mortgage	B. Cost per acre of mortgage
2020	_____ acres with mortgage	$ _____ per acre
2021	_____ acres with mortgage	$ _____ per acre
2022	_____ facres with mortgage	$ _____ per acre

Q24. Did you lease from someone else any of the San Juan County land you farmed from 2020-2022? *Do not include land you sub-leased to others.*

① Yes
② No → **Skip to Q29**

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Q25. Of the acres you leased from someone else in San Juan County, how many did you farm in each of the three most recent years, 2020-2022, and what was the average cost of the lease per acre each year? *Please provide a response to both columns A and B for each row.*

	A. Farmed acres leased from someone	B. Cost per acre of lease
2020	_____ acres leased	$ _____ per acre
2021	_____ acres leased	$ _____ per acre
2022	_____ acres leased	$ _____ per acre

Q26. What percentage of San Juan County land you leased from someone else is used for each of the following?

	Land Used for this Purpose
Haying	_____ %
Livestock	_____ %
Vegetable production	_____ %
Grain/cropland	_____ %
Aquaculture	_____ %
Forest-use land	_____ %
Housing	_____ %
Another use. Please describe: _____	_____ %

Q27. Is your lease formal *(written contracts or written agreements)* **or informal** *(verbal contracts, general understanding, handshake)***?**

① Formal (written contracts or written agreements)
② Informal (verbal contracts, general understanding, handshake)
③ Both or a combination

Q28. How do you pay for the leased land in San Juan County?

	Yes	No
Lease fee	①	②
Trade	①	②
Payment per unit (e.g. per bale)	①	②
No rent	①	②
Other. Please describe: _____	①	②

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Q29. What were your total gross annual sales for the agricultural products and services on your San Juan County farmed land in 2022?

① $0 (no sales) → **Skip to Q31**
② $1 to $999
③ $1000 to $2,499
④ $2,500 to $4,999
⑤ $5,000 to $9,999
⑥ $10,000 to $19,999
⑦ $20,000 to $24,999
⑧ $25,000 to $39,999
⑨ $40,000 to $49,999
⑩ $50,000 to $99,999
⑪ $100,000 to $249,999
⑫ $250,000 to $499,999
⑬ $500,000 or more (If more than $500,000, please specify: $_____

Q30. What was your net profit for the agricultural products and services on your San Juan County farmed land in 2022? *(sales less expenses)*

① $0 (no sales)
② $1 to $999
③ $1000 to $2,499
④ $2,500 to $4,999
⑤ $5,000 to $9,999
⑥ $10,000 to $19,999
⑦ $20,000 to $24,999
⑧ $25,000 to $39,999
⑨ $40,000 to $49,999
⑩ $50,000 to $99,999
⑪ $100,000 to $249,999
⑫ $250,000 to $499,999
⑬ $500,000 or more (If more than $500,000, please specify: $_____

Q31. How much did you pay in taxes in 2022?

① $0
② $1 to $999
③ $1000 to $2,499
④ $2,500 to $4,999
⑤ $5,000 to $9,999
⑥ $10,000 to $19,999
⑦ $20,000 to $24,999
⑧ $25,000 to $39,999
⑨ $40,000 to $49,999
⑩ $50,000 to $99,999
⑪ $100,000 to $249,999
⑫ $250,000 to $499,999
⑬ $500,000 or more (If more than $500,000, please specify: $_____

Q32. In 2022, what is the estimated value of food produced on your San Juan County farm that you provided for your family and others that was not exchanged for money (including bartered products and services)? *Do not include donations to others.*

① $0 (none)
② $1 to $999
③ $1000 to $1,999
④ $2,000 to $2,999
⑤ $3,000 to $3,999
⑥ $4,000 to $4,999
⑦ $5,000 to $5,999
⑧ $6,000 to $6,999
⑨ $7,000 to $7,999
⑩ $8,000 to $8,999
⑪ $9,000 to $9,999
⑫ $10,000 or more (If more than $10,000, please specify: $_____

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Q33. In 2022, for each of the products produced on your San Juan County farm, please provide the following information: (A) what percentage of your farm's total market value was from the product and (B) how many acres of your total farmland was dedicated to each product. *If land is shared by two or more products, enter the total land dedicated to each product including both shared or unshared. Please provide a response to columns A and B for each row. Enter 0 in each column if you do not have that revenue source.*

	A. Percentage of Total Market Value in 2022	B. Acres of Land for Commodity in 2022
Vegetables, herbs, melons, potatoes	_____ %	_____ acres
Fruits, tree nuts, berries	_____ %	_____ acres
Grain, hay, oilseeds, dry beans, dry peas	_____ %	_____ acres
Nursery/flowers	_____ %	_____ acres
Beef cattle	_____ %	_____ acres
Dairy cows	_____ %	_____ acres
Other cattle and calves	_____ %	_____ acres
Hogs and pigs	_____ %	_____ acres
Poultry for meat	_____ %	_____ acres
Eggs	_____ %	_____ acres
Animal fiber (wool, mohair)	_____ %	_____ acres
Sheep for dairy	_____ %	_____ acres
Other sheep	_____ %	_____ acres
Lamb or mutton for meat	_____ %	_____ acres
Goats for dairy	_____ %	_____ acres
Other goats	_____ %	_____ acres
Goat for meat	_____ %	_____ acres
Agritourism	_____ %	_____ acres
Services (haying, fence-building, plowing, etc.)	_____ %	
Other. Please specify: _____	_____ %	_____ acres
	Total 100%	

Q34. How much of each of the following livestock did your San Juan County farm have in 2022? *Enter "0" if none.*

	# of Livestock
Dairy cattle	_____
Beef cattle and calves	_____
Hogs and pigs	_____
Sheep and lambs	_____
Poultry	_____
Horses	_____
Other. Please specify: _____	_____

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Q35. Do you need assistance to maintain production or put your San Juan County land under production?

① Yes
② No

Q36. Do you need support for any of the following actions on your San Juan County land?

	Yes	No
Farm succession	①	②
Support to lease your land	①	②
Put a conservation easement on your land	①	②
Other. Please describe: _____	①	②

Q37. Are you interested in collaborating with other farmers on any of the following?

	Yes	No
Sharing equipment	①	②
Providing mentorship	①	②
Sharing farmworker housing	①	②
Collaborative internship programs	①	②

Q38. Would you consider pursuing any of the following revenue opportunities on your San Juan County farm if the regulations allowed for it?

	Yes	No
Eating establishment/restaurant	①	②
Tasting rooms	①	②
Commercial compost facility	①	②
Event venue	①	②
Education facility	①	②
Something else. Please specify:_____	①	②

Q39. What is your owner equity, or debt to asset ratio for your San Juan County farm? *The Farm Debt to Asset Ratio is calculated by dividing the farm's total debt by the farm's total assets.*

Farm Debt to Asset Ratio Calculator

Debts (bank or other loans for land or machinery, outstanding debts and outstanding taxes)	$ _____
Assets (value of land, machinery, livestock, other assets, outstanding income	$ _____
Owner equity: Debt/Assets	$ _____

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Q40. Has climate change impacted your San Juan County farming operation in any way?

① Yes
② No → **Skip to Q43**

Q41. In which of the following ways has climate change impacted your operation?

	Yes	No
Excess water	①	②
Lack of water	①	②
Crop loss	①	②
Declining yields	①	②
Plant/pest pressure	①	②
Decline in pollination	①	②
Changing markets	①	②
Fires	①	②
Anxiety about the future	①	②
Some other way. Please specify: _____	①	②

Q42. Have you implemented any of the following practices in response to climate change?

	Yes	No
No-till or reduced till	①	②
Prescribed grazing	①	②
Riparian plantings	①	②
Agroforestry	①	②
Cover cropping	①	②
Mulching	①	②
Wildlife/pollinator planting	①	②
Energy efficiency upgrades	①	②
Rain water catchment	①	②
Use or production of biochar	①	②
Use or production of compost	①	②
Something else. Please specify: _____	①	②

Q43. Is this farm or ranch primarily or fully…

	Yes	No
Female-owned	①	②
Minority-owned	①	②
Owned by a veteran	①	②

11

Q44. What was your age on your last birthday?

_____ Age in years

Q45. How many more years do you plan to continue farming?

① 0
② 1-5 years
④ 6-10 years
⑤ 11-20 years
⑥ 21-30 years
⑤ More than 30 years

Q46. What are your plans for your farm when you are done farming? *Please explain.*

That is our last question. Thank you very much for your help with this important survey. If you have any other comments about farming in San Juan County, please feel free to include them in the space below.

Please return the completed questionnaire in the postage-paid envelope provided.

Questions about this survey may be directed to:
The Social and Economic Sciences Research Center
PO Box 641801, Washington State University
Pullman, WA 99164-1801
ted@wsu.edu | 509-335-1722

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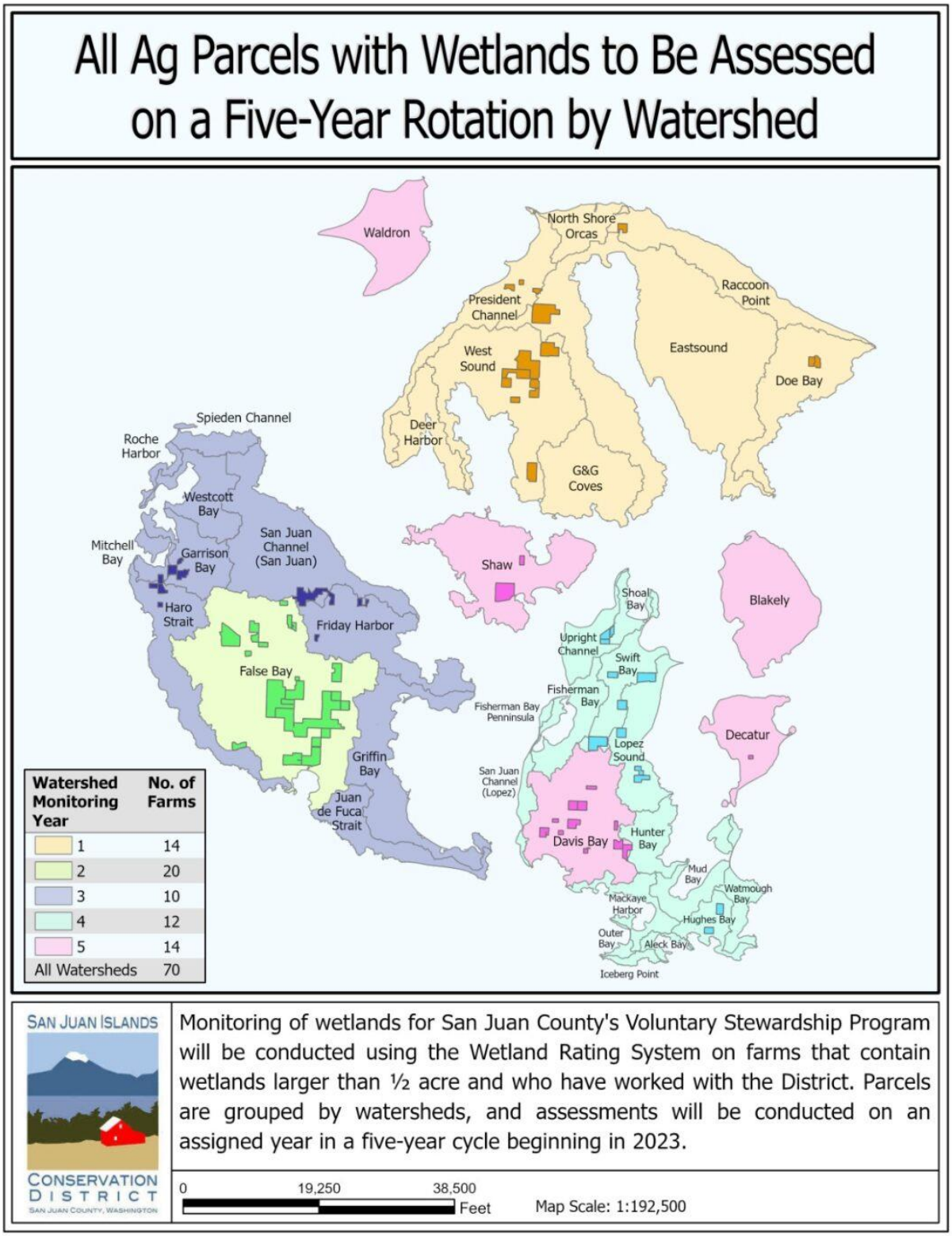
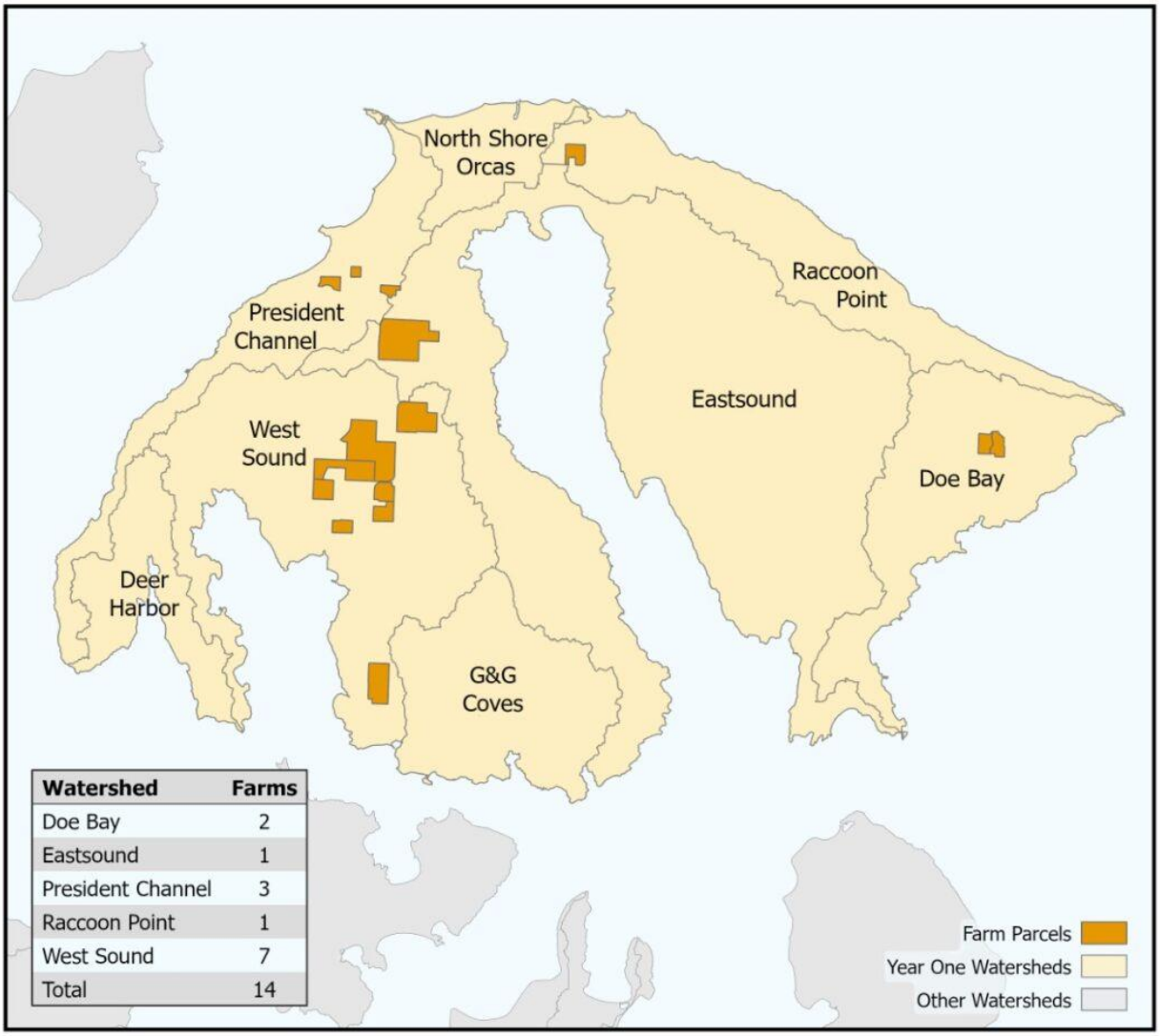
2021 Questionnaire

Appendix B – Monitoring Maps

B-1 Wetland Field Assessments Monitoring Maps



Ag Parcels with Wetlands to Be Assessed in Year One of a Five-Year Rotation by Watershed



Watershed	Farms
Doe Bay	2
Eastsound	1
President Channel	3
Raccoon Point	1
West Sound	7
Total	14

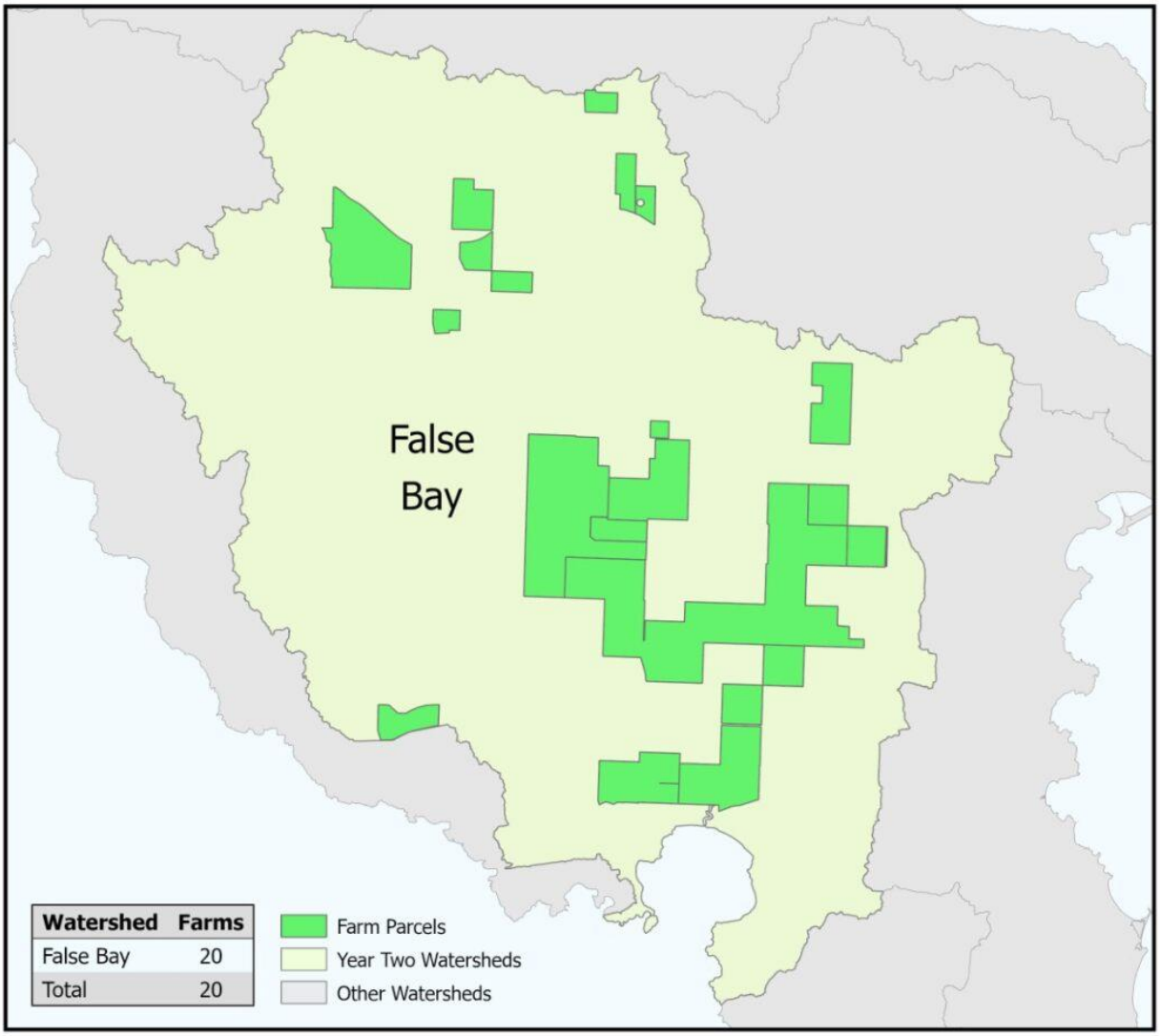
SAN JUAN ISLANDS CONSERVATION DISTRICT SAN JUAN COUNTY, WASHINGTON

Monitoring of wetland conditions for the Voluntary Stewardship Program will be conducted using the Wetland Rating System on farms that contain wetlands larger than ½ acre and who have worked with the District. Wetland parcels in all Orcas Island watersheds will receive an assessment every five years beginning in the first year of the cycle.

0 11,000 22,000 Feet

Map Scale: 1:110,000

Ag Parcels with Wetlands to Be Assessed in Year Two of a Five-Year Rotation by Watershed



Watershed	Farms
False Bay	20
Total	20

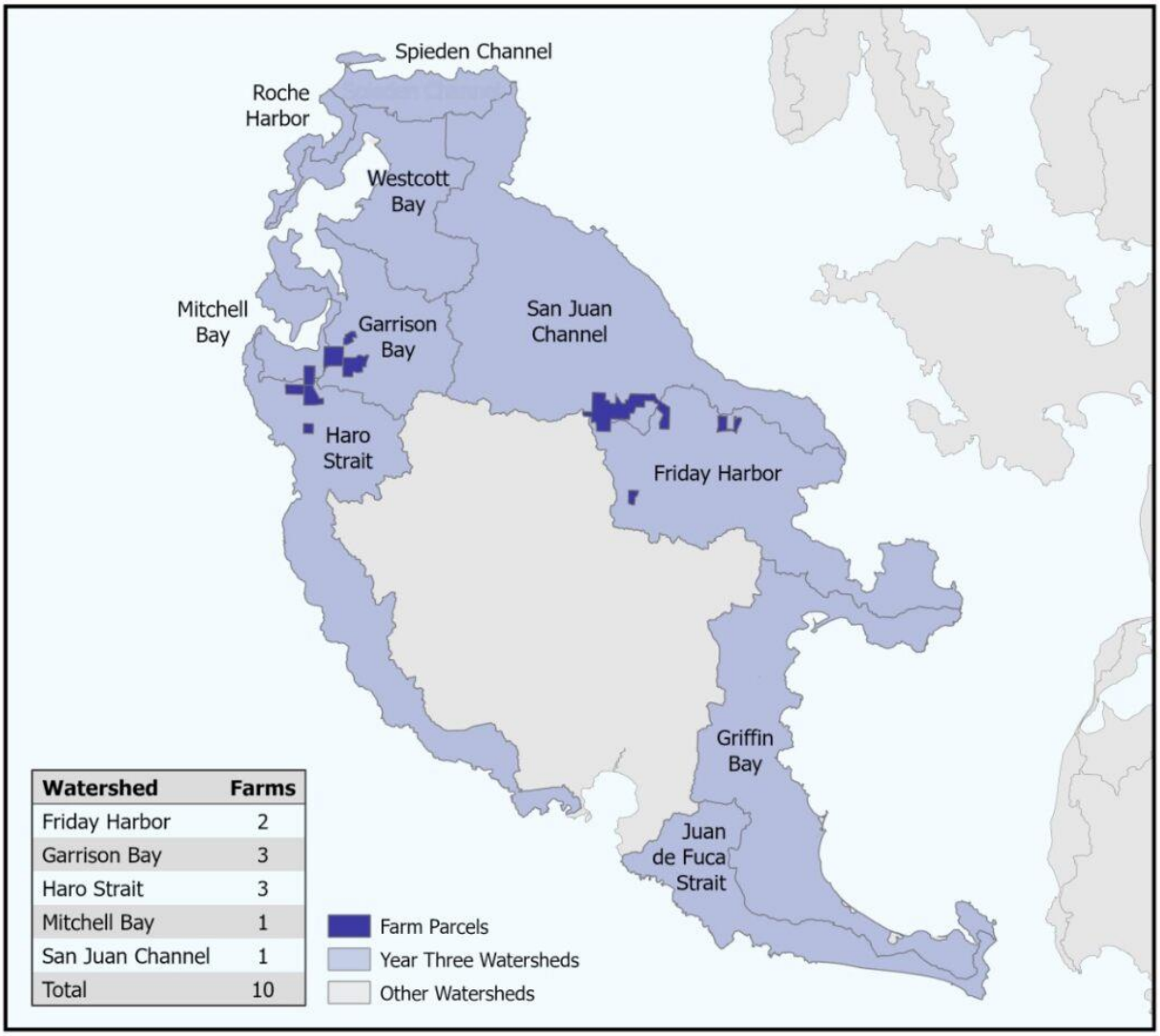
SAN JUAN ISLANDS CONSERVATION DISTRICT
SAN JUAN COUNTY, WASHINGTON

Monitoring of wetland conditions for the Voluntary Stewardship Program will be conducted using the Wetland Rating System on farms that contain wetlands larger than ½ acre and who have worked with the District. Wetland parcels in False Bay Watershed will receive an assessment every five years beginning in the second year of the cycle.

0 5,500 11,000 Feet

Map Scale: 1:55,000

Ag Parcels with Wetlands to Be Assessed in Year Three of a Five-Year Rotation by Watershed



Watershed	Farms
Friday Harbor	2
Garrison Bay	3
Haro Strait	3
Mitchell Bay	1
San Juan Channel	1
Total	10

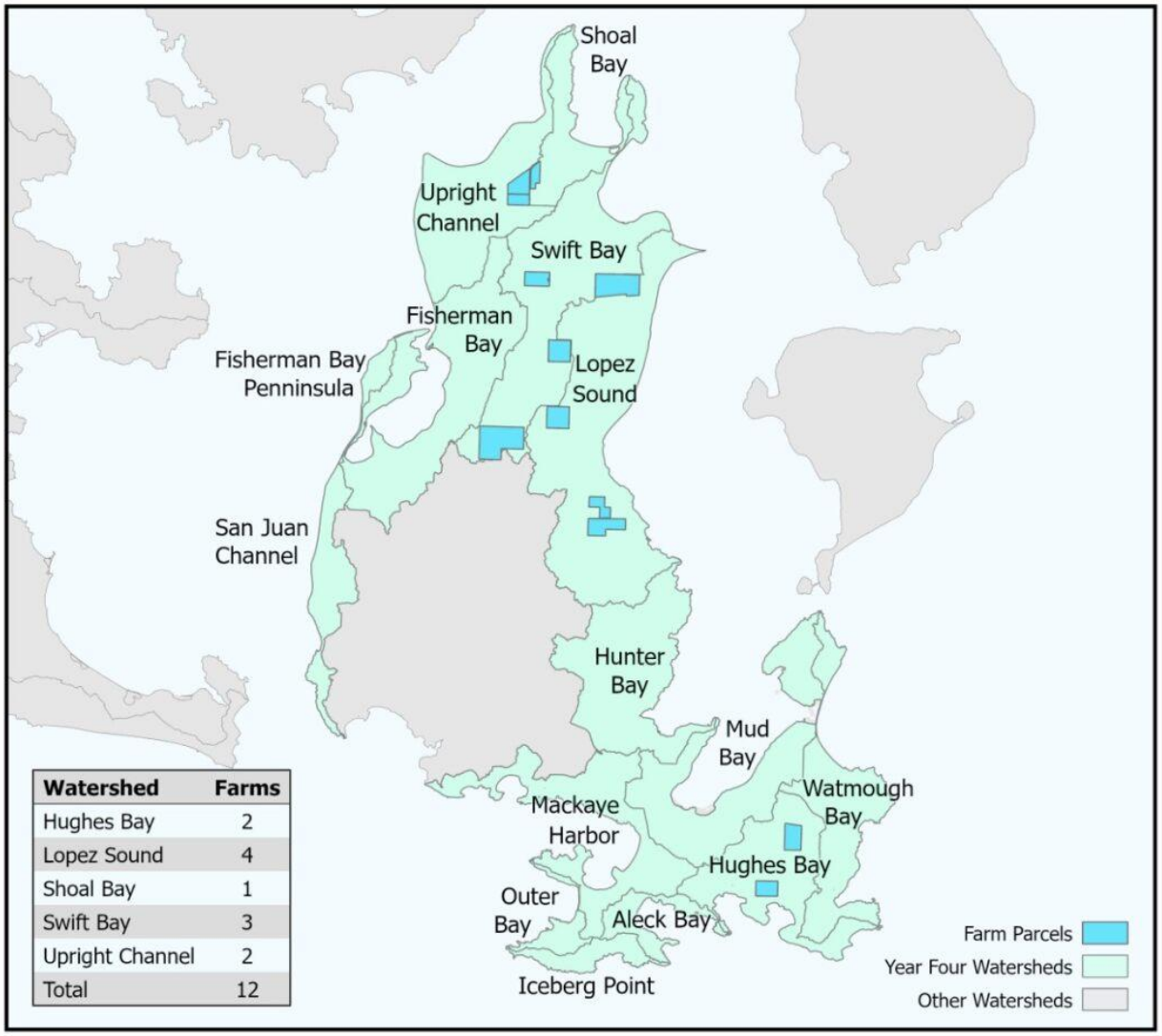
SAN JUAN ISLANDS CONSERVATION DISTRICT SAN JUAN COUNTY, WASHINGTON

Monitoring of wetland conditions for the Voluntary Stewardship Program will be conducted using the Wetland Rating System on farms that contain wetlands larger than ½ acre and who have worked with the District. Wetland parcels in all San Juan Island Watersheds excluding False Bay will receive an assessment every five years beginning in the third year of the cycle.

0 11,500 23,000 Feet

Map Scale: 1:115,000

Ag Parcels with Wetlands to Be Assessed in Year Four of a Five-Year Rotation by Watershed



Watershed	Farms
Hughes Bay	2
Lopez Sound	4
Shoal Bay	1
Swift Bay	3
Upright Channel	2
Total	12

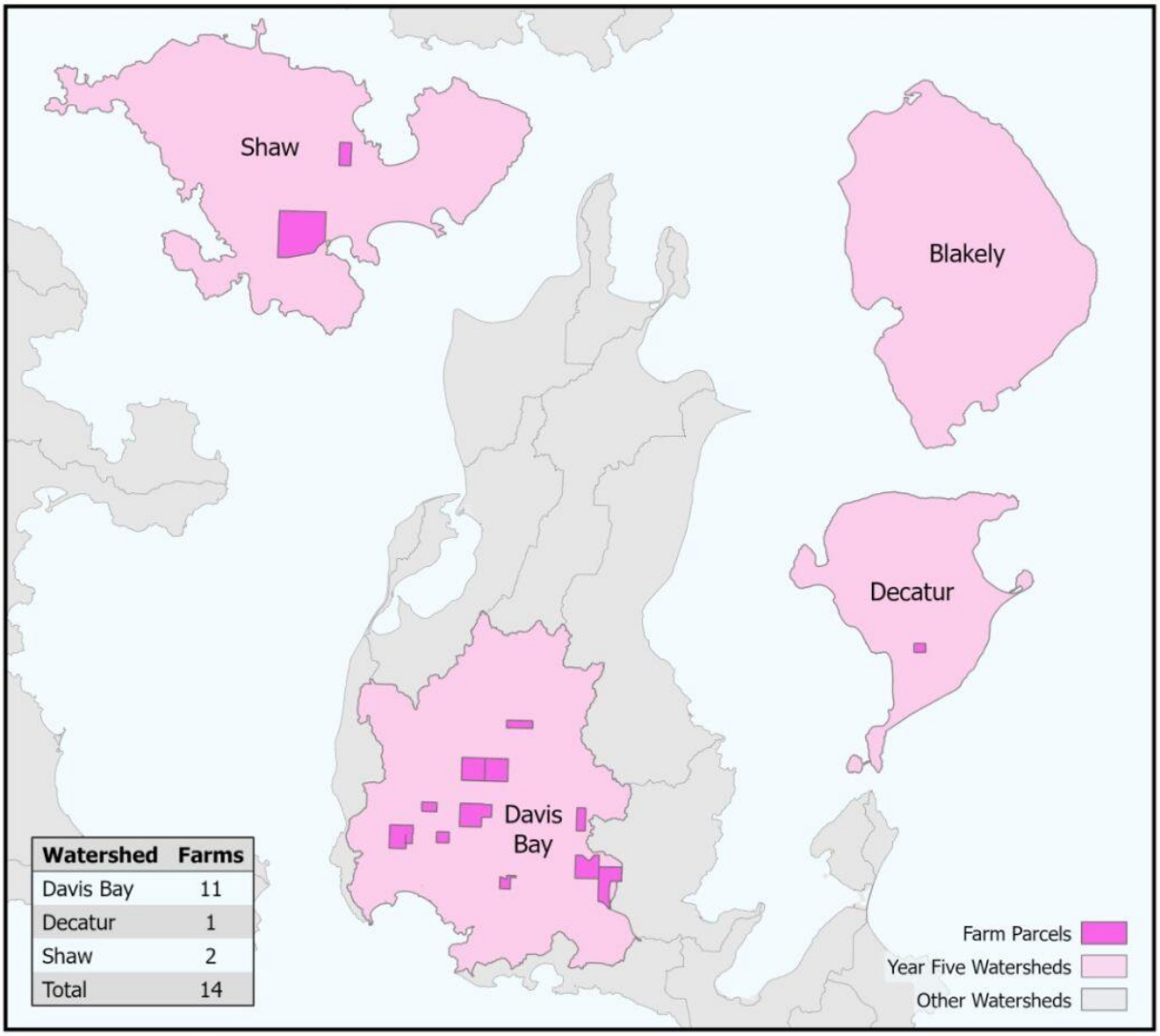
SAN JUAN ISLANDS CONSERVATION DISTRICT SAN JUAN COUNTY, WASHINGTON

Monitoring of wetland conditions for the Voluntary Stewardship Program will be conducted using the Wetland Rating System on farms that contain wetlands larger than ½ acre and who have worked with the District. Wetland parcels in all Lopez Island watersheds excluding Davis Bay will receive an assessment every five years beginning in the fourth year of the cycle.

0 10,000 20,000 Feet

Map Scale: 1:100,000

Ag Parcels with Wetlands to Be Assessed in Year Five of a Five-Year Rotation by Watershed



Watershed	Farms
Davis Bay	11
Decatur	1
Shaw	2
Total	14

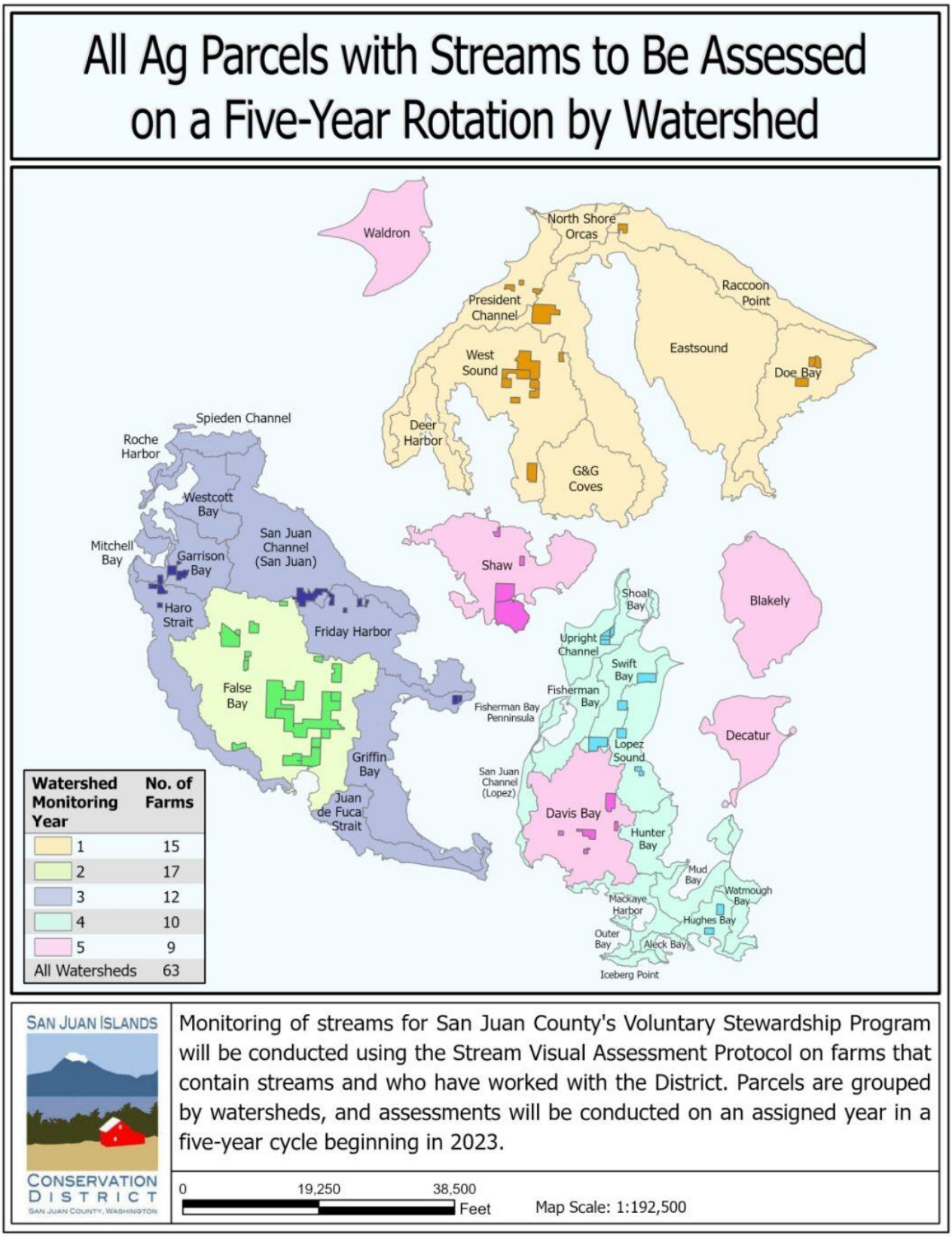
SAN JUAN ISLANDS CONSERVATION DISTRICT SAN JUAN COUNTY, WASHINGTON

Monitoring of wetland conditions for the Voluntary Stewardship Program will be conducted using the Wetland Rating System on farms that contain wetlands larger than ½ acre and who have worked with the District. Wetland parcels on Shaw and Decatur Islands and in Davis Bay watershed will receive an assessment every five years beginning in the fifth year of the cycle.

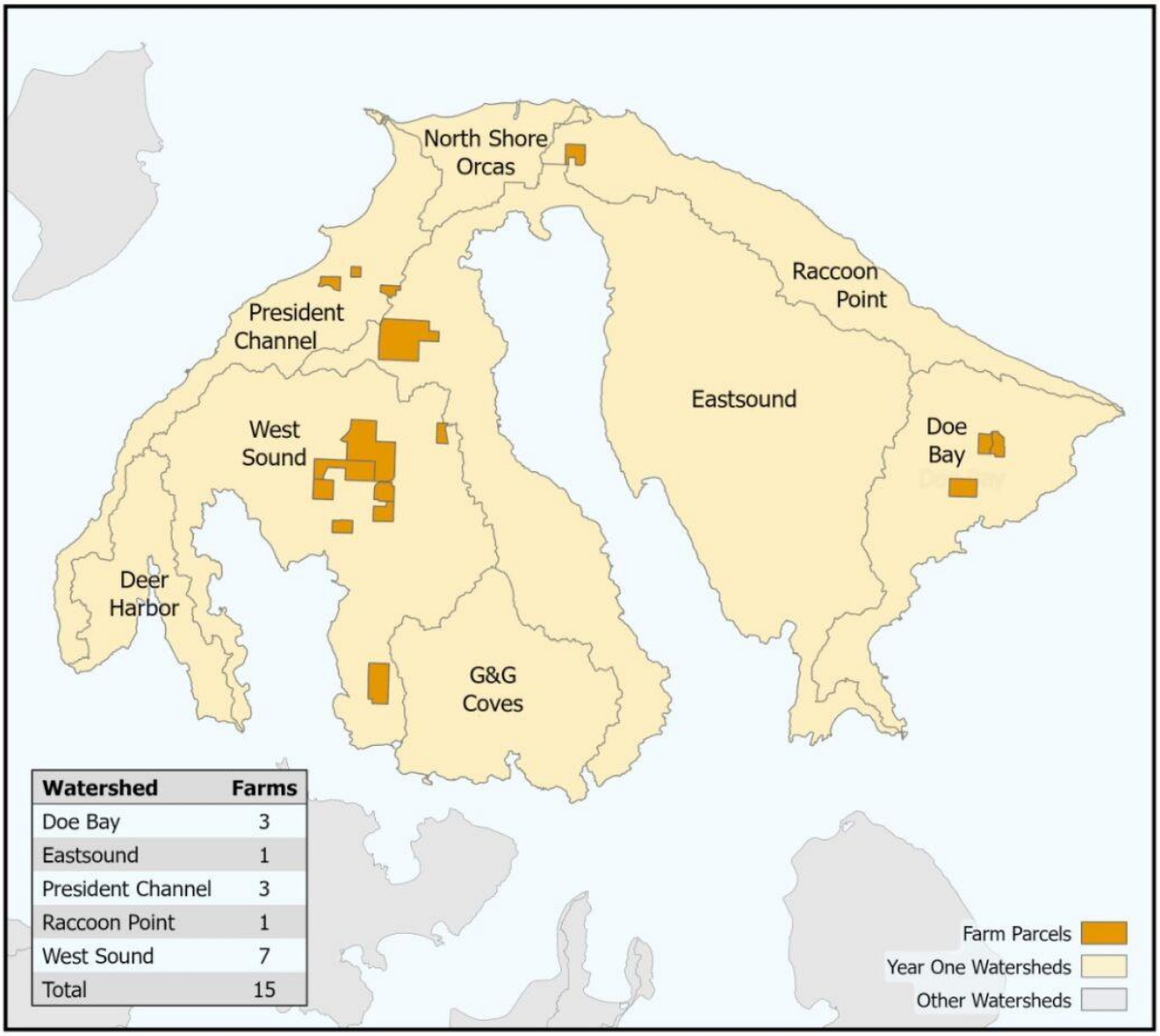
0 9,500 19,000 Feet

Map Scale: 1:95,000

B-2 Stream Field Assessments Monitoring Maps



Ag Parcels with Streams to Be Assessed in Year One of a Five-Year Rotation by Watershed



Watershed	Farms
Doe Bay	3
Eastsound	1
President Channel	3
Raccoon Point	1
West Sound	7
Total	15

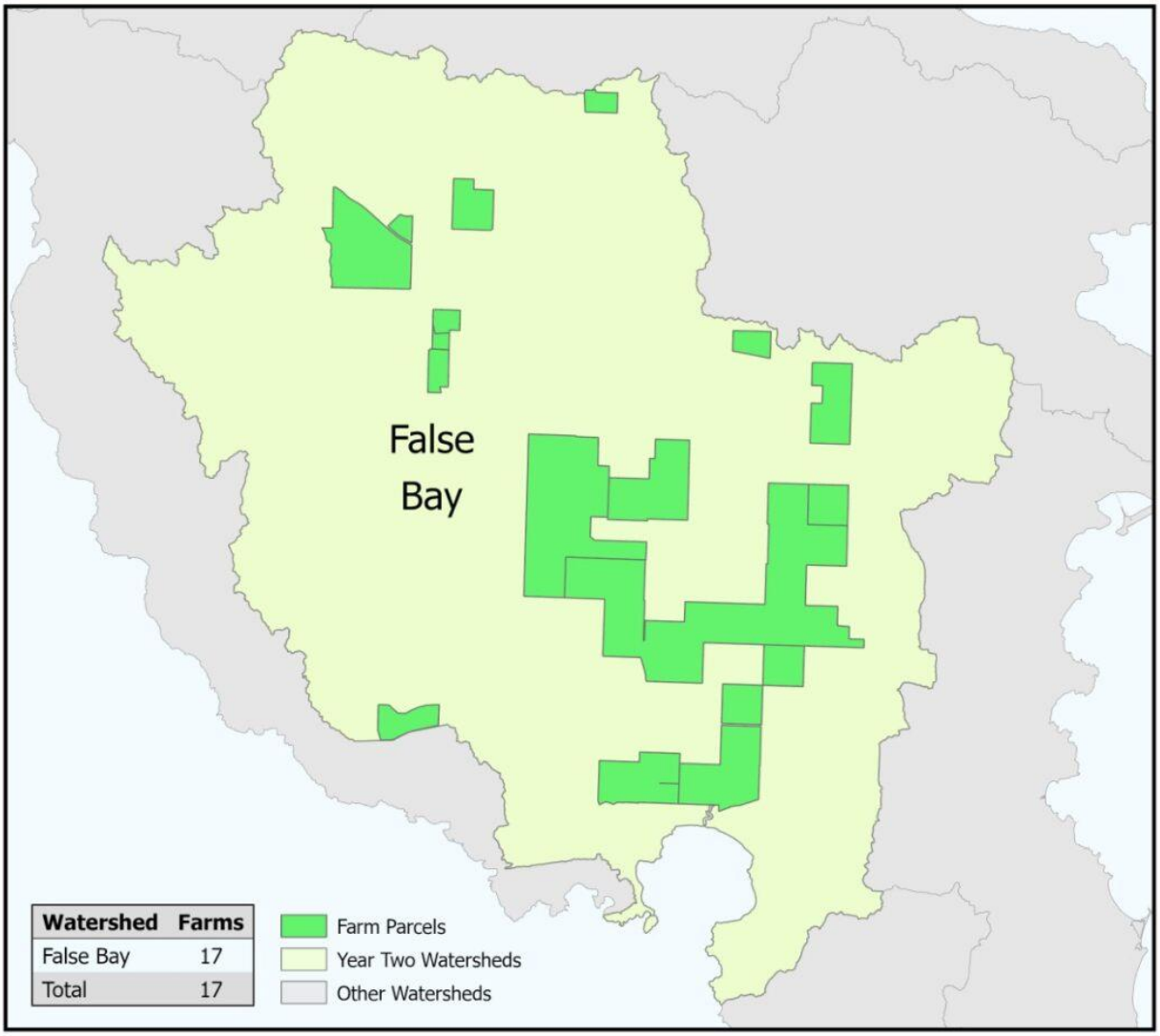
SAN JUAN ISLANDS CONSERVATION DISTRICT
SAN JUAN COUNTY, WASHINGTON

Monitoring of stream conditions for the Voluntary Stewardship Program will be conducted using the Stream Visual Assessment Protocol on farms that contain streams and who have worked with the District. Stream parcels in all Orcas Island watersheds will receive an assessment every five years beginning in the first year of the cycle.

0 11,000 22,000 Feet

Map Scale: 1:110,000

Ag Parcels with Streams to Be Assessed in Year Two of a Five-Year Rotation by Watershed



Watershed	Farms
False Bay	17
Total	17

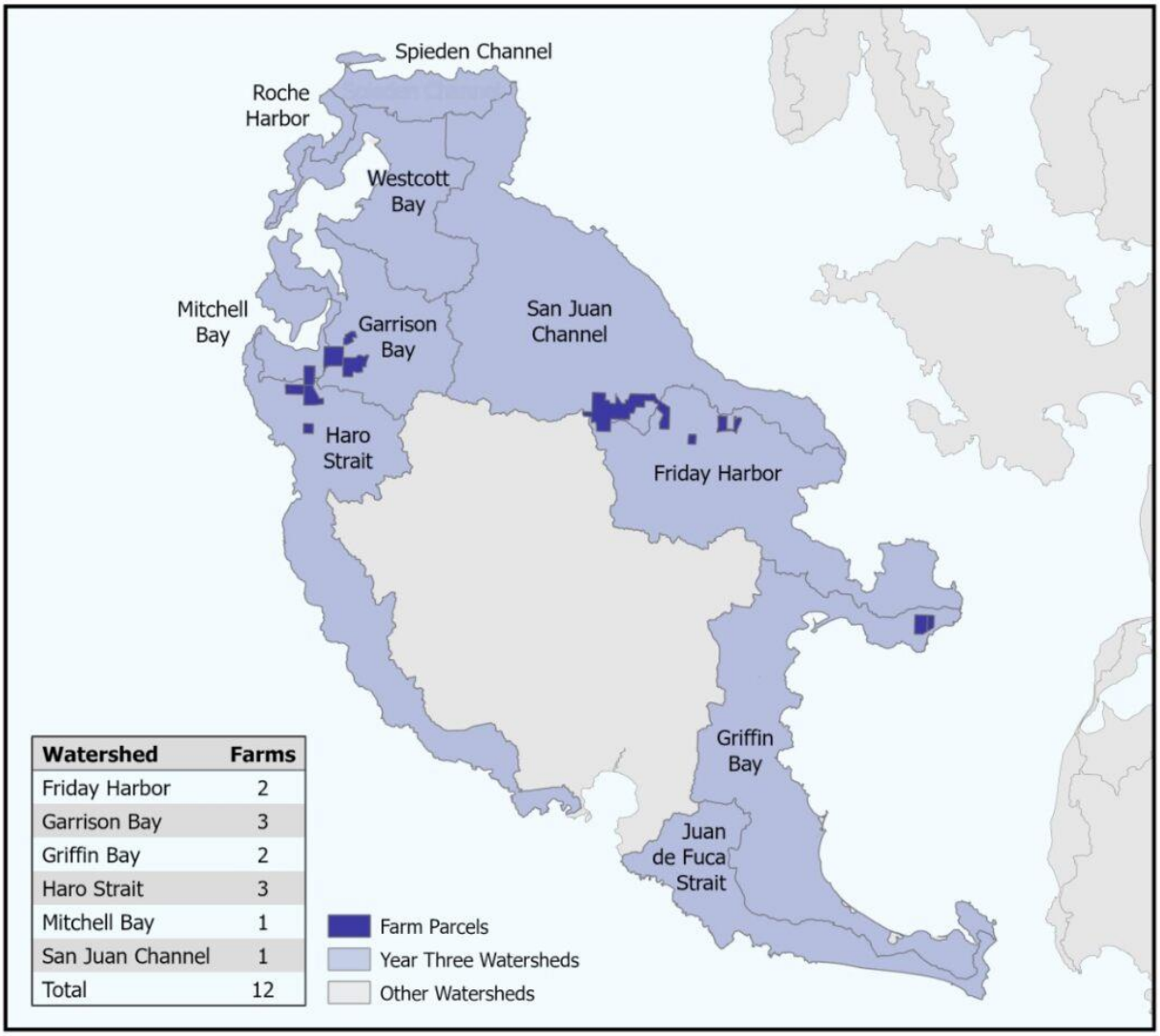
SAN JUAN ISLANDS CONSERVATION DISTRICT
SAN JUAN COUNTY, WASHINGTON

Monitoring of stream conditions for the Voluntary Stewardship Program will be conducted using the Stream Visual Assessment Protocol on farms that contain streams and who have worked with the District. Stream parcels in False Bay watershed will receive an assessment every five years beginning in the second year of the cycle.

0 5,500 11,000 Feet

Map Scale: 1:55,000

Ag Parcels with Streams to Be Assessed in Year Three of a Five-Year Rotation by Watershed



Watershed	Farms
Friday Harbor	2
Garrison Bay	3
Griffin Bay	2
Haro Strait	3
Mitchell Bay	1
San Juan Channel	1
Total	12

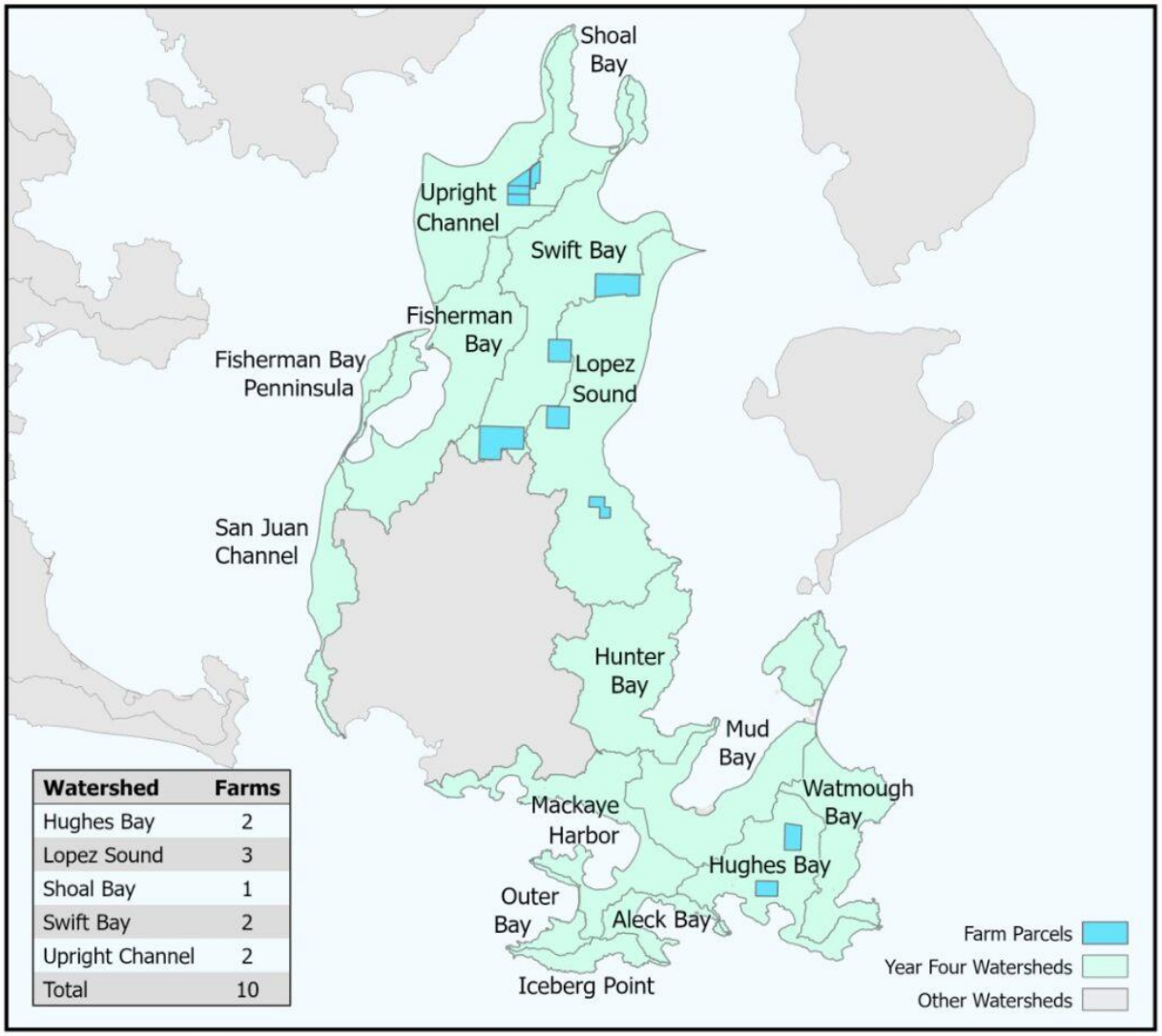
SAN JUAN ISLANDS CONSERVATION DISTRICT SAN JUAN COUNTY, WASHINGTON

Monitoring of stream conditions for the Voluntary Stewardship Program will be conducted using the Stream Visual Assessment Protocol on farms that contain streams and who have worked with the District. Stream parcels in all San Juan Island watersheds excluding False Bay will receive an assessment every five years beginning in the third year of the cycle.

0 11,500 23,000 Feet

Map Scale: 1:115,000

Ag Parcels with Streams to Be Assessed in Year Four of a Five-Year Rotation by Watershed



Watershed	Farms
Hughes Bay	2
Lopez Sound	3
Shoal Bay	1
Swift Bay	2
Upright Channel	2
Total	10

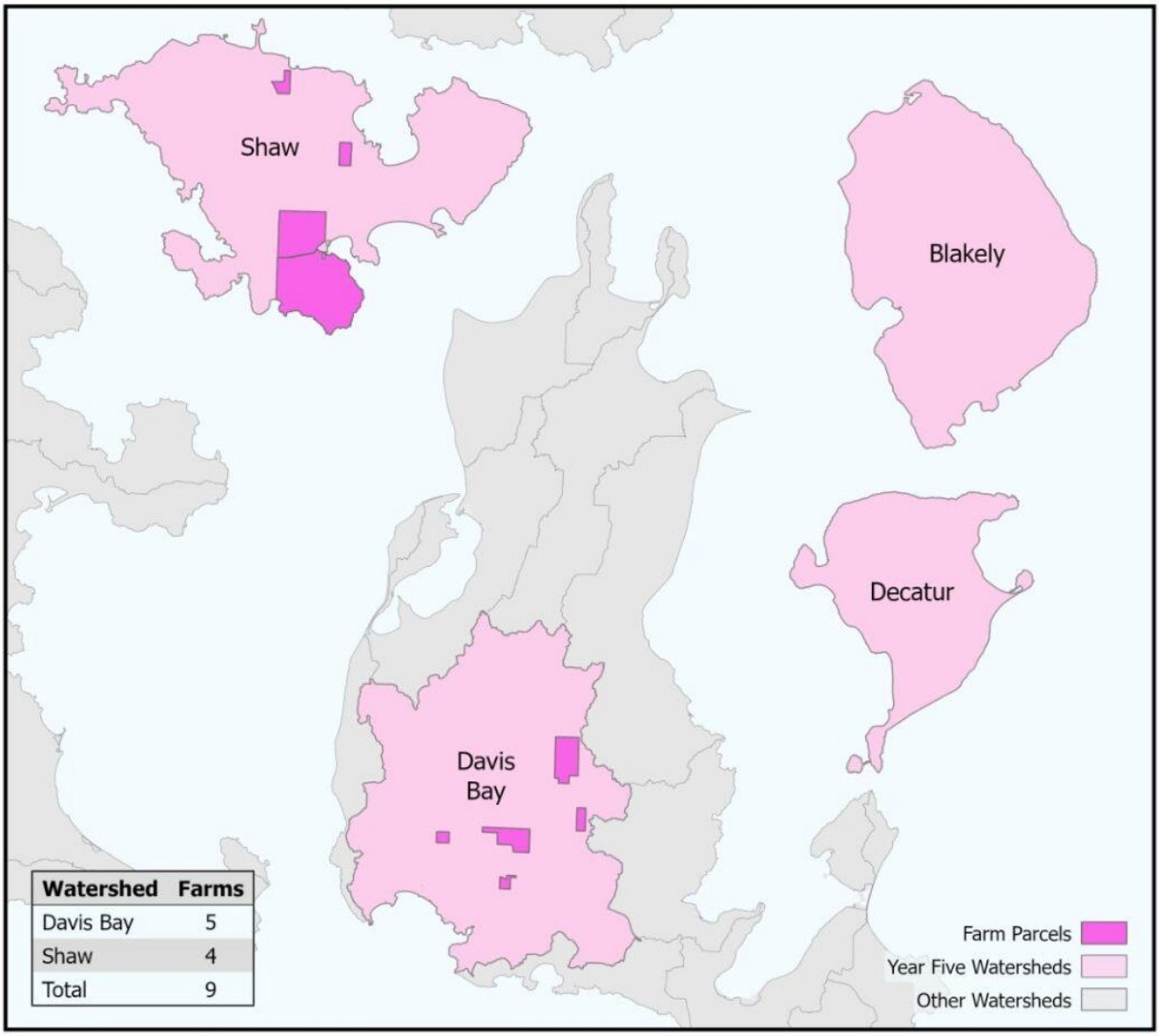
SAN JUAN ISLANDS CONSERVATION DISTRICT SAN JUAN COUNTY, WASHINGTON

Monitoring of stream conditions for the Voluntary Stewardship Program will be conducted using the Stream Visual Assessment Protocol on farms that contain streams and who have worked with the District. Stream parcels in all Lopez Island watersheds excluding Davis Bay will receive an assessment every five years beginning in the fourth year of the cycle.

0 10,000 20,000 Feet

Map Scale: 1:100,000

Ag Parcels with Streams to Be Assessed in Year Five of a Five-Year Rotation by Watershed



Watershed	Farms
Davis Bay	5
Shaw	4
Total	9

SAN JUAN ISLANDS CONSERVATION DISTRICT
SAN JUAN COUNTY, WASHINGTON

Monitoring of stream conditions for the Voluntary Stewardship Program will be conducted using the Stream Visual Assessment Protocol on farms that contain streams and who have worked with the District. Stream parcels on Shaw Island and in Davis Bay watershed will receive an assessment every five years beginning in the fifth year of the cycle.

0 9,500 19,000 Feet

Map Scale: 1:95,000

Appendix C – Best Management Practices to Protect or Enhance Critical Areas

Wetland-related BMPs		
Select practices that can help protect or improve wetland water quality, water quantity, and habitat.		
Name	**Practice Number**	**Description**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
Brush Management	314	The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.
Composting Facility	317	A structure or device to contain and facilitate an aerobic microbial ecosystem for the decomposition of manure, other organic material, or both, into a final product sufficiently stable for storage, on-farm use, and application to land as a soil amendment.
Cover Crop	340	Grasses, legumes, and forbs planted for seasonal vegetative cover.
Fence	382	A constructed barrier to animals or people.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
Herbaceous Weed Treatment	315	The removal or control of herbaceous weeds including invasive, noxious, and prohibited plants.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Nutrient Management	590	Manage rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts.
Restoration of Rare or Declining Natural Communities	643	Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.
Wetland Enhancement	659	The augmentation of wetland functions beyond the original natural conditions on a former, degraded, or naturally functioning wetland site; sometimes at the expense of other functions.
Wetland Restoration	657	The return of a wetland and its functions to a close approximation of its original condition as it existed prior to disturbance on a former or degraded wetland site.
Wetland Wildlife Habitat Management	644	Retaining, developing, or managing wetland habitat for wetland wildlife.

Stream-related BMPs		
Select practices that can help protect or improve water quality, water quantity, and riparian habitat, including fish passage barrier removal.		
Name	**Practice Number**	**Description (from NRCS Conservation Practice Standard sheets)**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
Brush Management	314	The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.
Composting Facility	317	A structure or device to contain and facilitate an aerobic microbial ecosystem for the decomposition of manure, other organic material, or both, into a final product sufficiently stable for storage, on-farm use, and application to land 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.
Fence	382	A constructed barrier to animals or people.
Field Border	386	A strip of permanent vegetation established at the edge or around the perimeter of a field.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
Forage and Biomass Planting	512	Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Heavy Use Area Protection	561	Stabilization or protection of an intensively used area.
Hedgerow Planting	422	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.
Herbaceous Weed Treatment	315	The removal or control of herbaceous weeds including invasive, noxious, and prohibited plants.
Irrigation System, Micro-irrigation	441	An irrigation system for frequent application of 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 Water Management	449	The process of determining and controlling the volume, frequency, and application rate of irrigation water.
Nutrient management	590	Manage rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts.
Prescribed grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
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 of Rare or Declining Natural Communities	643	Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.
Riparian Forest Buffer	391	An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.
Riparian Herbaceous Cover	390	Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.
Roof Runoff Structure	558	A structure that will collect, control, and convey precipitation runoff from a roof.
Stream Crossing	578	A stabilized area or structure constructed across a stream to provide controlled access for people, livestock, equipment, or vehicles.
Stream Habitat Improvement and Management	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.
Structures for Wildlife	649	A structure installed to replace or modify a missing or deficient wildlife habitat component.
Tree-Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.
Watering Facility	614	A watering facility stores or provides drinking water to livestock or wildlife.

Upland Habitat-related BMPs		
Select practices that can help protect or improve habitats for species of local importance.		
Name	**Practice Number**	**Description**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
Brush Management	314	The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.
Conservation Cover	327	Establishing and maintaining permanent vegetative cover .
Cover Crop	340	Grasses, legumes, and forbs planted for seasonal vegetative cover.
Early Successional Habitat Development	647	Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
Fence	382	A constructed barrier to animals or people.
Field Border	386	A strip of permanent vegetation established at the edge or around the perimeter of a field.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
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.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Heavy Use Area Protection	561	Stabilization or protection of an intensively used area.
Hedgerow Planting	422	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.
Herbaceous Weed Treatment	315	The removal or control of herbaceous weeds including invasive, noxious, and prohibited plants.
Nutrient management	590	Manage rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts.
Prescribed grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
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 of Rare or Declining Natural Communities	643	Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.
Roof Runoff Structure	558	A structure that will collect, control, and convey precipitation runoff from a roof.
Structures for Wildlife	649	A structure installed to replace or modify a missing or deficient wildlife habitat component.
Tree-Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.
Upland Wildlife Habitat Management	645	Provide and manage upland habitats and connectivity within the landscape for wildlife.
Watering Facility	614	A watering facility stores or provides drinking water to livestock or wildlife.
Wildlife Habitat Planting	420	Establishing wildlife habitat by planting herbaceous vegetation or shrubs.

GHA-related BMPs		
Select practices that help to minimize erosion and prevent sedimentation.		
Name	**Practice Number**	**Description**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
Conservation Cover	327	Establishing and maintaining permanent vegetative cover .
Contour Buffer Strips	332	Narrow strips of permanent, herbaceous vegetative cover established around the hill slope, and alternated down the slope with wider cropped strips that are farmed on the contour.
Contour Farming	330	Aligning ridges, furrows, and roughness formed by tillage, planting, and other operations to alter velocity and/or direction of water flow to around the hillslope.
Contour Orchard and Other Perennial Crops	331	Planting orchards, vineyards, or other perennial crops so that all cultural operations are done on or near the contour.
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 seeding/planting methods.
Fence	382	A constructed barrier to animals or people.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Heavy Use Area Protection	561	Stabilization or protection of an intensively used area.
Hedgerow Planting	422	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.
Prescribed grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
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.
Tree-Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.

(CARA) Recharge-related BMPs		
Select practices that help to retain water in the landscape and promote water conservation. Encourage cooperators to measure their own water levels.		
Name	**Practice Number**	**Description**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
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).
Contour Farming	330	Aligning ridges, furrows, and roughness formed by tillage, planting, and other operations to alter velocity and/or direction of water flow to around the hillslope.
Contour Orchard and Other Perennial Crops	331	Planting orchards, vineyards, or other perennial crops so that all cultural operations are done on or near the contour.
Cover Crop	340	Grasses, legumes, and forbs planted for seasonal vegetative cover.
Field Border	386	A strip of permanent vegetation established at the edge or around the perimeter of a field.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
Forage and Biomass Planting	512	Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Grazing Land Mechanical Treatment	548	Modifying physical soil and/or plant conditions with mechanical tools by treatments such as pitting, contour furrowing, and chiseling, ripping, or subsoiling. (For the purpose of fracturing compacted soil layers and improving soil permeability; reducing water runoff and increasing infiltration)
Irrigation System, Micro-irrigation	441	An irrigation system for frequent application of 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 Water Management	449	The process of determining and controlling the volume, frequency, and application rate of irrigation water.
Prescribed grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
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.
Riparian Forest Buffer	391	An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.
Riparian Herbaceous Cover	390	Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.
Wetland Enhancement	659	The augmentation of wetland functions beyond the original natural conditions on a former, degraded, or naturally functioning wetland site; sometimes at the expense of other functions.
Wetland Restoration	657	The return of a wetland and its functions to a close approximation of its original condition as it existed prior to disturbance on a former or degraded wetland site.

(CARA) Groundwater quality-related BMPs		
Select practices that can help prevent groundwater pollution.		
Name	**Practice Number**	**Description**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
Composting Facility	317	A structure or device to contain and facilitate an aerobic microbial ecosystem for the decomposition of manure, other organic material, or both, into a final product sufficiently stable for storage, on-farm use, and application to land 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.
Fence	382	A constructed barrier to animals or people.
Field Border	386	A strip of permanent vegetation established at the edge or around the perimeter of a field.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Heavy Use Area Protection	561	Stabilization or protection of an intensively used area.
Irrigation System, Micro-irrigation	441	An irrigation system for frequent application of 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 Water Management	449	The process of determining and controlling the volume, frequency, and application rate of irrigation water.
Nutrient management	590	Manage rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts.
Prescribed grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
Roof Runoff Structure	558	A structure that will collect, control, and convey precipitation runoff from a roof.
Riparian Herbaceous Cover	390	Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.
Tree-Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.
Stream Crossing	578	A stabilized area or structure constructed across a stream to provide controlled access for people, livestock, equipment, or vehicles.
Stream Habitat Improvement and Management	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.
Watering Facility	614	A watering facility stores or provides drinking water to livestock or wildlife.
Wetland Enhancement	659	The augmentation of wetland functions beyond the original natural conditions on a former, degraded, or naturally functioning wetland site; sometimes at the expense of other functions.
Wetland Restoration	657	The return of a wetland and its functions to a close approximation of its original condition as it existed prior to disturbance on a former or degraded wetland site.

Stream-related BMPs		
Select practices that can help to preserve natural flood control, stormwater storage, drainage, and floodplain connectivity, including flood channels and/or high-flow channels.		
Name	**Practice Number**	**Description**
Access Control	472	The temporary or permanent exclusion of animals, people, vehicles, and equipment from an area.
Brush Management	314	The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.
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).
Contour Farming	330	Aligning ridges, furrows, and roughness formed by tillage, planting, and other operations to alter velocity and/or direction of water flow to around the hillslope.
Contour Orchard and Other Perennial Crops	331	Planting orchards, vineyards, or other perennial crops so that all cultural operations are done on or near the contour.
Cover Crop	340	Grasses, legumes, and forbs planted for seasonal vegetative cover.
Early Successional Habitat Development	647	Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
Fence	382	A constructed barrier to animals or people.
Field Border	386	A strip of permanent vegetation established at the edge or around the perimeter of a field.
Filter Strip	393	A strip or area of herbaceous vegetation that removes contaminants from overland flow.
Forage and Biomass Planting	512	Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.
Grassed Waterway (swale)	412	A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet.
Grazing Land Mechanical Treatment	548	Modifying physical soil and/or plant conditions with mechanical tools by treatments such as pitting, contour furrowing, and chiseling, ripping, or subsoiling. (For the purpose of fracturing compacted soil layers and improving soil permeability; reducing water runoff and increasing infiltration)
Hedgerow Planting	422	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.
Herbaceous Weed Treatment	315	The removal or control of herbaceous weeds including invasive, noxious, and prohibited plants.
Prescribed grazing	528	Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.
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 of Rare or Declining Natural Communities	643	Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.
Riparian Forest Buffer	391	An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.
Riparian Herbaceous Cover	390	Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.
Stream Habitat Improvement and Management	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.
Structures for Wildlife	649	A structure installed to replace or modify a missing or deficient wildlife habitat component.
Tree-Shrub Establishment	612	Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.
Watering Facility	614	A watering facility stores or provides drinking water to livestock or wildlife.