Grays Harbor County
Volunteer Stewardship Program

Work Plan

September 17, 2018

VSP Submittal Checklist

Required Elements for the VSP Work Plan

RCW 36.70A.720 (1) requires each Voluntary Stewardship Program (VSP) Work Plan to address the following elements:

Element	Work Plan Location
(a) Review and incorporate applicable: • Water quality data and plans • Watershed management plans • Farmland protection data and plans • Species recovery data and plans	Appendix F • Section 4, Watershed Subbasin Profiles pages 30 – 64 & pages 70 – 75 • Pages 70 – 72 • Pages 76 – 77 • Pages 23 – 28
(b) Seek input from tribes, agencies, and stakeholders	Appendix A
(c) Develop goals for participation by agricultural operators conducting commercial and noncommercial agricultural activities in the watershed necessary to meet the protection and enhancement benchmarks of the Work Plan	Chapter 4, Outreach & Participation, page 42 and Agricultural Viability Goal #7, page 32 – 33
(d) Ensure outreach and technical assistance is provided to agricultural operators in the watershed	Chapter Three, Work Plan Implementation, pages 37 – 41, Chapter Four, Outreach & Participation Four, pages 42 - 51
(e) Create measurable benchmarks that within ten years after receipt of funds, are designed to result in: (i) The protection of critical area functions and values (ii) The enhancement of critical area functions and values through voluntary incentive-based measures	Chapter Two – Goals, Action Plans, & Benchmarks, pages 9 - 36
(f) Designate the entity or entities that will provide technical assistance	Chapter Three, Work Plan Implementation, page 38
(g) Work with the entity providing technical assistance to ensure that individual stewardship plans contribute to the goals and benchmarks of the Work Plan	Chapter Four, Outreach & Participation pages 46 - 49 Appendix B, Individual Stewardship Plan template
(h) Incorporate into the Work Plan existing development regulations relied to achieve the goals and benchmarks for protection	Frequently flooded areas, protection benchmark, pages 20 – 22

Element	Work Plan Location
(i) Establish baseline monitoring for: (i) Participation activities and implementation of the voluntary stewardship plans and projects, (ii) Stewardship activities, and (iii) The effects on critical areas and agriculture relevant to the protection and enhancement benchmarks developed for the watershed	Chapter Five, Monitoring, Adaptive Management, & Reporting Requirements • Pages 52 - 61
(j) Conduct periodic evaluation, institute adaptive management, and provide a written report of the status of plans and accomplishments to the county and the commission within sixty days after the end of each biennium	Chapter Five, Monitoring, Adaptive Management, & Reporting Requirements • Pages 63 - 64
(k) Assist state agencies in their monitoring programs	Chapter Five, Monitoring, Adaptive Management, & Reporting Requirements • Page 62
(l) Satisfy any other reporting requirements of the program	Chapter Five, Monitoring, Adaptive Management, & Reporting Requirements • Page 63

Acknowledgements

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Abbreviations

CARA ..... Critical Aquifer Recharge Area
County ..... Grays Harbor County
DNR ..... Washington State Department of Natural Resources
ECY ..... Washington State Department of Ecology
ESA ..... Endangered Species Act
FEMA ..... Federal Emergency Management Agency
FFA ..... Frequently Flooded Area
FIRM ..... Flood Insurance Rate Map
FOTG ..... Field Office Technical Guide
FWHCA ..... Fish and Wildlife Habitat Conservation Area
GHA ..... Geologically Hazardous Area
GHCD ..... Grays Harbor Conservation District
GIS ..... Geographic Information System
GMA ..... Growth Management Act
HRCD ..... High Resolution Change Detection
ISP ..... Individual Stewardship Plan
MOU ..... Memorandum of Understanding
NASS ..... National Agricultural Statistics Service
NDVI ..... Normalized Difference Vegetation Index
NFIP ..... National Flood Insurance Program
NRCS ..... Natural Resources Conservation Service
NWI ..... National Wetlands Inventory
RCW ..... Revised Code of Washington
TMDL ..... Total Maximum Daily Load
USDA ..... U.S. Department of Agriculture
USFWS ..... United States Fish and Wildlife Service
USGS ..... U.S. Geological Survey
VSP ..... Voluntary Stewardship Program
WAC ..... Washington Administrative Code
WDFW ..... Washington Department of Fish and Wildlife
WRIA ..... Water Resource Inventory Area
WSCC ..... Washington State Conservation Commission
WSDA ..... Washington State Department of Agriculture

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Appendix F: Work Plan Background Information (Separate volume)

List of Tables

Introduction

Backdrop to VSP

Under the Growth Management Act (GMA), counties are required to protect critical areas and conserve agricultural lands of long-term commercial significance.

Critical areas under GMA are lands that support unique natural environments or contain natural hazards. Critical areas requiring protection under GMA include:

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

Poor management practices on critical area lands can jeopardize public safety as well as important natural resources that are important to the cultural and economic well-being of our state.

Conserving agricultural lands is equally important under GMA. Agriculture on a commercial and noncommercial scale contributes to feeding our nation and the world. It has, and continues to play, an essential role in the history, culture, and economy of the State of Washington.

Because critical areas and agricultural lands often overlap with one another, and with each having equal importance under GMA, finding the right balance for accommodating the needs of both can be a test for counties. Reconciling this challenge becomes particularly difficult when inadvertent or historic practices on some agricultural lands negatively affect the function and value of critical areas. Commonly accepted agricultural practices in the past are now conflicting with changing expectations for environmental management.

Retrofitting existing agriculture to meet these new demands can be problematic. The GMA reliance on protecting critical areas on agricultural lands through regulation created significant clashes between environmental interests and the agricultural community. Past attempts to find a solution generated a host of expensive and contentious lawsuits, GMA appeals, legislative battles, and voter initiatives. This created a high degree of uncertainty for everyone, but especially so for the economic survival of agriculture.

Washington's governor and legislature in 2007 recognized the importance of resolving this conflict when it asked the Ruckelshaus Center to facilitate a dialog between representatives from government, agriculture, and environmental interests. The outcome of this three-year negotiation process was an agreement to create a program that would offer incentives to the agricultural community to implement voluntary-based actions that would maintain and enhance critical areas. The state

soon after turned the agreement into law, which became the Voluntary Stewardship Program, an amendment to the GMA.[1]

The legislature adopted the Voluntary Stewardship Program (VSP) in 2011 with the intent to:

> "*Promote plans to protect and enhance critical areas within the area where agricultural activities are conducted, while maintaining and improving the long-term viability of agriculture in the state of Washington and reducing the conversion of farmland to other uses*."[2]

Key VSP Concepts

VSP is unique in that it allows those counties that opt into the program to avoid the traditional regulatory approach to managing agricultural activities near or on critical areas. Instead, it allows counties to prepare a coordinated Work Plan with measurable benchmarks that encourage the implementation of voluntary actions on agricultural lands that protect and enhance critical areas on a watershed scale.

There are several key concepts under VSP that deserve special attention:

- Voluntary. VSP does not place any requirement on a landowner engaged in agricultural activities to restore, protect, or enhance critical areas under GMA regulations. Instead, it focuses on voluntary compliance coupled with incentives. However, VSP is not a replacement for compliance with other local, state or federal laws and regulations.

- Agricultural activities. VSP uses the broad definition for agricultural activities as defined under RCW 90.58.065. This very broad definition spans the range of agricultural operations - from the private landowner engaged in agriculture for their own sustenance to the largest commercial operations.

  While the RCW 90.58.065 does not include aquaculture within the definition for agriculture, the Grays Harbor Work Plan recognizes aquaculture as an agricultural activity and extends the same benefits to it within the allowances of state law.[3]

- Protect. Under VSP, "protect" means "to prevent the degradation of functions and values [of critical areas] existing as of July 22, 2011." This date represents a "red line" for agricultural activities. For the county to remain in VSP, agricultural activities cannot exceed a further loss in critical area functions and values that existed on this date as measured at a watershed scale.

- Enhance. Enhance or enhancement means "to improve the processes, the structure, and functions existing, as of July 22, 2011, of ecosystems and habitats associated with critical areas." VSP encourages enhancement but does not mandate it. It is important to note that there is no set standard in VSP that

measures scope and extent of enhancement. Furthermore, enhancement does not have to restore critical area functions and values to original conditions.

- Watershed scale. VSP does not measure protection and enhancement of critical area functions and values on a property-by-property basis, but rather collectively on a watershed scale. A watershed means "a water resource inventory area, salmon recovery planning area, or a subbasin as determined by a county." The flexibility of working on a watershed scale allows for a more creative approach to protection and enhancement.

The Work Group and the Work Plan are the means for accomplishing VSP in Grays Harbor County.

The Work Group is a broad coalition of representatives from county agriculture, community, environmental, and state and tribal government. They act as an independent committee responsible for developing and implementing a Work Plan consistent with VSP requirements.

The Work Plan is a document that establishes the framework for how the Work Group will implement VSP within the county. The process used in developing the Work Plan involves:

- Reviewing and incorporating plans relating to water quality, watershed management, farmland protection, and species recovery;
- Incorporating input from stakeholders;
- Creating measurable benchmarks that within ten years of receiving funding for the Work Plan:
    - Results in the protection of critical area functions and values as well as their enhancement through voluntary, incentive-based measures, and
    - Ensures the viability of agriculture and reduces the conversion of agricultural lands to other uses;
- Developing outreach goals for participation and technical assistance to agricultural producers in the watershed;
- Establishing baseline monitoring for participation activities, implementation of voluntary stewardship plans and projects, the effects on critical areas and agriculture relevant to the benchmarks; and
- Identifying a process for periodically evaluating the outcomes of the Work Plan and making appropriate changes when necessary to ensure achieving the originally set benchmarks.

Once the Work Group develops a Work Plan, they submit it to the Washington State Conservation Commission Technical Panel and Statewide Advisory Committee for approval, independent of the county. Grays Harbor County and the Grays Harbor Conservation District provide technical and facilitation support to the Work Group.

Upon approval of the Work Plan by the Conservation Commission, the Work Group retains the responsibility for supervising the implementation of Work Plan. This may include making changes to the Work Plan to ensure it continues to make progress. The Work Group will also be responsible for reporting to the Conservation Commission the Work Plans progress after each biennium, assisting state agencies in their monitoring programs, and satisfy any other reporting requirements of the program.

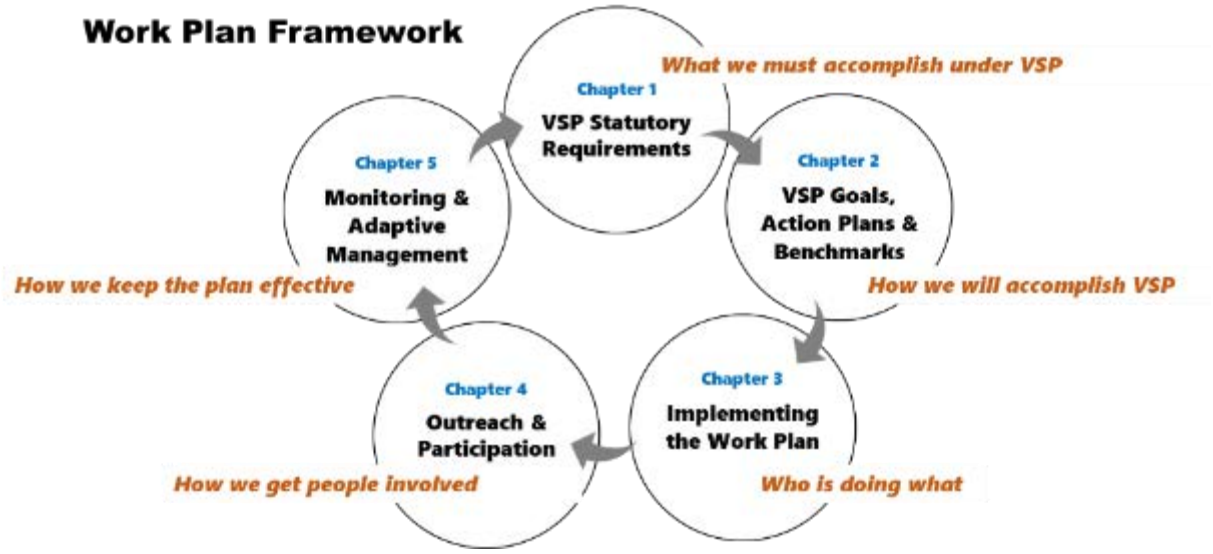
Advantages of VSP for County Agriculture

VSP offers significant advantages to the Grays Harbor County agricultural community in that it:

- ☑ Keeps agricultural activities outside of the GMA regulatory framework in relation to protecting the function and values of critical areas;
- ☑ Enables a grassroots approach to find an appropriate balance between economically viable agricultural production and environmental protection that reflects Grays Harbor County goals and values;
- ☑ Puts the individual agricultural producer in charge of making their own decisions about how they want to engage in voluntary stewardship practices in a manner that fits their land and resources;
- ☑ Provides agricultural producers greater flexibility in the choice of voluntary stewardship options rather than being forced to use fixed, impracticable solutions like buffers;
- ☑ Facilitates the delivery of increased stewardship resources to agricultural producers;
- ☑ Introduces new opportunities for improving the long-term viability of agricultural operations that increase management skills, production, and profitability;
- ☑ Counts stewardship practices implemented since July 22, 2011 toward enhancement benchmarks, thereby recognizing the past good stewardship practices agriculture continues to accomplish;
- ☑ Measures VSP success on a watershed scale and not on a parcel-by-parcel basis; and
- ☑ Establishes a forum and builds local leadership that can promote agricultural interests on both a county and state level

Organization of the VSP Work Plan

The Grays Harbor County VSP Work Plan consists of five chapters and supporting appendices. Altogether, they create a framework for implementing and sustaining VSP in the county.



Chapter 1. VSP Statutory Requirements

The first chapter highlights the two statutory requirements the Work group must achieve through the VSP Work Plan.

Chapter 2. VSP Goals, Action Plans, & Benchmarks

Chapter Two outlines how the Work Group will accomplish the VSP statutory requirements through 12 broad goals. There are five goals that address critical areas and seven goals that focus on agriculture viability.

Each goal contains an action plan that includes one or more management objectives and examples of stewardship practices and activities that suggest implementation approaches. Stewardship practices are actions that agricultural operators can use to protect or voluntarily enhance a critical area. Stewardship practices and activities that enhance are particularly important for offsetting actions taken on agricultural lands by other operators that degrade critical area functions and values.

Following each action plan are benchmarks. Benchmarks establish standards for protecting the July 2011 baseline for critical areas and sets goals for voluntary enhancement of critical areas. Benchmarks are an important monitoring tool for evaluating overall Work Plan progress at attaining goals and action plans.

Chapter 3. Implementing the Work Plan

Effective implementation of the Work Plan depends on clearly defined responsibilities. Chapter 3 outlines the roles of and interaction between the Work Group, the Grays Harbor Conservation District, and Grays Harbor County. It also discusses the importance of leveraging resources through partnerships with secondary technical providers.

Chapter 3. Outreach and Participation

This chapter explains how the Work Plan will encourage commercial and noncommercial agricultural operators to engage in VSP and implement voluntary stewardship practices.

Chapter 5. Monitoring and Adaptive Management

Monitoring establishes a process for the Work Group to evaluate how well the Work Plan is accomplishing its goals, action plans, and benchmarks. If the Work Group discovers the Work Plan is not performing as expected, adaptive management explains how to make changes to stay on target. This chapter is critical for keeping the plan relevant. It also ensures that county agriculture remains in VSP and avoids the standard GMA regulatory approach for protecting critical areas on agricultural lands.

Appendices: Supporting Documents

The appendices contain detailed information used by the Work Group to create the Work Plan. Keeping this information in the appendices allows Work Group members and interested readers to go back and understand the thought process behind the development of the Work Plan. This approach makes the Work Plan a shorter, more concise and readable document for Work Group members and the public. The appendices include information about:

- Appendix A: History of Work Plan Development

  Includes information about when Grays Harbor County opted into VSP, the Work Group formation, who participated in the development of the Work Plan, and a summary of the individual planning sessions.

- Appendix B: Individual Stewardship Plan Format

  Provides an overview of how the Technical Provider will work with agricultural operators to prepare Individual Stewardship Plans (ISP), including a template to use.

- Appendix C: Current List of Stewardship Projects since July 22, 2011

  This appendix includes a list of stewardship projects implemented between July 2011 and December 31, 2017.

- Appendix D: Potential Resources

  Includes a list of potential programs and resources available to the Work Group and the Technical Provider to assist agricultural operators in implementing stewardship practices with or without an ISP.

- Appendix E: Other regulations applying to agricultural activities

  The purpose of this appendix is to remind readers that VSP does not preclude other local, state, and federal laws and regulations applying to critical areas on agricultural lands. The appendix provides a table listing these laws, including a brief description and which critical areas they may affect.

- Appendix F: Work Plan Background Information

  Appendix F is a detailed source of information about: county agriculture; its intersection with critical areas in the county as they existed as of July 22, 2011 at a watershed scale; and a summary of key plans and information resources that identify management actions for protecting and enhancing critical area functions.

  The Work Group relied on the information within this appendix for setting Work Plan goals, management objectives, and benchmarks. The appendix will also be an important resource in evaluating VSP success through the monitoring program discussed in Chapter 5.

Chapter One
VSP Statutory Requirements

The Grays Harbor County Work Group has adopted a Work Plan that will achieve the legislated requirements of the Voluntary Stewardship Program.[4] The Work Group embraces the principle that both legislative requirements stand on equal footing.

➲ Voluntarily protect & enhance critical area functions and values on agricultural lands as they existed at a watershed scale as of July 22, 2011

This Work Plan will voluntarily protect and enhance critical areas on agricultural lands by:

- Adopting goals, an action plan, and benchmarks for each critical area;
- Establishing an outreach and participation effort for encouraging involvement in the Voluntary Stewardship Program; and
- Utilizing a monitoring and adaptive management program to evaluate and sustain the efficacy of the Work Plan.

While the Voluntary Stewardship Program does not require enhancement of critical area functions and values above and beyond the 2011 baseline, the Work Plan will strive to encourage agricultural operators to adopt stewardship practices that provide long-term benefit to the environment.

➲ Ensure the long-term viability of agriculture and reduce the conversion of agricultural land to other uses

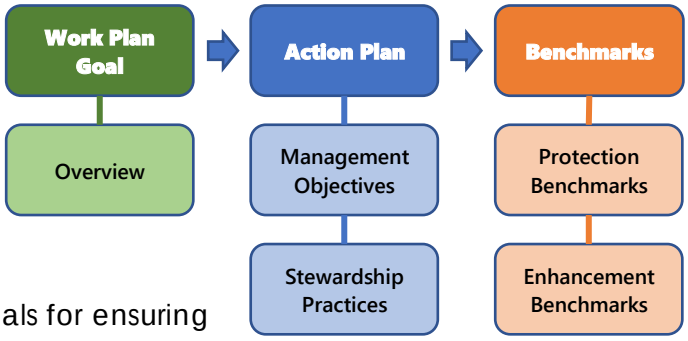
The requirements to voluntarily protect and enhance critical areas on agricultural lands will not be successful unless agriculture itself is successful. The Work Plan can increase the viability of agriculture in the county by promoting voluntary stewardship practices that strive to increase the productivity and profitability for all types of agricultural activities.

The Work Group further recognizes that VSP can provide a unique opportunity for improving and expanding agriculture in the county. Within the VSP framework, the Work Group will strive to build leadership in the agricultural community, bring resources that increase its profitability, prevent the conversion of farmland to other uses, and prepare the next generation of commercial and noncommercial agricultural producers.

The Work Plan adopts seven goals for implementing agricultural viability.

Chapter Two
Goals, Action Plans, & Benchmarks

Chapter Organization



Work Plan Goals are specific and measurable milestones that achieve VSP statutory requirements. There are five goals that lay out detailed action plans that voluntarily protect and enhance critical areas.

These are followed by an additional seven goals for ensuring the viability of agricultural and reducing the conversion of agricultural land in Grays Harbor County.

Accompanying each goal is an introductory Overview that provides context to the goal and summarizes the key issues identified by the Work Group during its analysis of the information in Appendix F.

The Overview discussion serves as the foundation to the Action Plan, which describes how the Work Group will accomplish each goal using *management objectives* and *stewardship practices*.

- Management objectives identify pathways that lead toward accomplishing a goal. For critical areas, they are approaches to maintaining or improving functions and values. They also serve as an on-site diagnostic tool when developing an Individual Stewardship Plan for deciding how to address a specific site or situation. A goal can have one or more management objectives.
- Stewardship practices are specific actions or activities that implement a management objective, whether through an incentive-based program or an agricultural operator's own resources. Stewardship practices are the "building blocks" of VSP; they consist of actions that voluntarily protect and enhance critical areas or promote agricultural viability.

  To ensure the protection of the July 22, 2011 baseline, the Work Group encourages new or expanding commercial and noncommercial agricultural operators to use stewardship practices to avoid degrading critical areas on their lands. Stewardship practices that voluntarily enhance critical areas are equally important. They help offset degradation caused by agricultural operators who choose not to voluntary protect critical areas.

  The list of stewardship practices is a representative one; the Work Plan recognizes that each agricultural site is unique and that there are an unlimited number of

potential approaches for achieving a management objective. Many of these stewardship practices are NRCS conservation practices from the Field Office Technical Guide (FOTG) for Grays Harbor County. The specific FOTG code is included for reference. Other practices come from plans and programs that address critical area needs.

It is important to note that many stewardship practices that benefit critical area functions also provide significant productivity and profitability that benefit agricultural viability. These stewardship practices have an asterisk * next to them.

Appendix C inventories known stewardship practices implemented between June 2011 and 2017.

Benchmarks track progress at accomplishing Work Plan critical area goals. Benchmarks for critical areas are specific measures of key functions that evaluate if the Action Plan is are falling below, maintaining, or exceeding the July 22, 2011 baseline at a watershed scale. The monitoring program described in Chapter 5 establishes a process using High Resolution Change Detection to measure any changes to a benchmark at selected points in the future.

The VSP statute does not require benchmarks for agricultural viability goals.

Table 1 starting on page 34 provides a summary of each critical area goal, its action plan, benchmarks, and monitoring tool and frequency. Table 2 on page 36 summarizes agricultural viability goals and action plans.

Critical Areas Goal #1

Voluntarily Protect and Enhance Wetland Functions and Values

Overview

Wetlands on commercial agricultural lands in the county typically are located along rivers and streams, in small forested areas, and disconnected oxbows. Approximately 90% of the wetlands on commercial agricultural lands shown on the National Wetlands Inventory (NWI) maps are within the Cloquallum, Satsop, Wynoochee, and Lincoln subbasins. Many areas that appear as wetlands on the NWI maps were converted to agricultural lands long before the July 22, 2011 baseline.

Wetlands are areas inundated or saturated by surface water or groundwater and support a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands assist in the reduction of erosion, siltation, flooding, and groundwater and surface water pollution, and provide wildlife, plant, and fisheries habitats.

Established commercial agricultural development patterns adjacent to wetlands have not changed substantially in many years and likely will not in the future. VSP efforts should focus on protecting their existing status or encouraging projects that voluntarily enhance their function and value. The stewardship practices that will deliver the most value on commercial agricultural lands should emphasize direct and indirect methods that voluntarily enhance wetland functions for habitat, improve shoreline stabilization, and increase water collection and storage. Restricting livestock access and reducing the introduction of fertilizers and pesticides into wetlands will be particularly beneficial to enhancing functions.

Expansion of existing or creation of new noncommercial agricultural activities on residential parcels have the greatest potential for degrading wetland functions below the July 2011 baseline. Inappropriate and inadvertent agricultural practices on smaller parcels near wetlands can severely reduce riparian cover, create concentrated livestock access, generate nutrient management issues, propagate invasive species, alter habitat, and impact water quality. Stewardship practices that emphasize the implementation of both protection and/or voluntary enhancement is important for achieving this goal. Enrollment of wetlands as open space under Washington's Open Space Taxation Act (Land Use Code 94) will be a particularly important protection tool.

Currently, no information is available regarding the extent of wetlands on noncommercial agricultural lands. The Grays Harbor Conservation District will aid the Work Group in reaching out to these landowners to encourage voluntary stewardship practices that voluntarily protect or enhance wetlands.

Action Plan

The following action plan will voluntarily protect and enhance wetland functions and values:

Management objectives for protecting and enhancing wetland functions	Examples of stewardship practices to use
▶ Separate agricultural activities from wetlands	▪ Access control (NRCS Code 472) ▪ Alley cropping (NRCS Code 311)* ▪ Filter strips (NRCS Code 393) ▪ Fencing (NRCS Code 382) ▪ Grassed waterways (NRCS Code 412) ▪ Hedgerow planting (NRCS Code 422) ▪ Integrated pest management (NRCS Code 595)* ▪ Nutrient management (NRCS Code 590)* ▪ Vegetative barrier (NRCS Code 601) ▪ Watering facility (NRCS Code 614)*
▶ Enhance functions & values adjacent to and in wetlands	▪ Critical area planting (NRCS Code 342) ▪ Fish passage (NRCS Code 396) ▪ Herbaceous weed treatment (NRCS Code 315) ▪ Riparian forest buffer (NRCS Code 391) ▪ Riparian herbaceous cover (NRCS Code 390) ▪ Tree/shrub establishment (NRCS Code 612) ▪ Wetland enhancement (NRCS Code 659) ▪ Wetland restoration (NRCS Code 657) ▪ Wetland wildlife habitat management (NRCS Code 644)
▶ Conserve existing or create new wetlands	▪ Conservation Reserve Program* ▪ Conservation Reserve Enhancement Program* ▪ Conservation easements* ▪ Open Space enrollment* ▪ Wetland creation (NRCS Code 658)*

* Practices that may increase productivity and profitability

Key Plans, Studies and Reports Providing Further Guidance on Wetland Management Objectives:

- ▶ Field Office Technical Guide for Grays Harbor County
- ▶ Chehalis Basin Salmon Habitat Restoration and Preservation Strategy for WRIAs 22 and 23 (page F-67)
- ▶ Pacific County Lead Entity Strategy (page F-68)

- Wetlands and Conservation Compliance – What Every Iowa Farmer Needs to Know (USDA/NRCS Publication – available through https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs142p2_008540)
- Framework and Ground/Surface-Water Interactions of the Chehalis River Basin, Southwestern Washington (page F-65)

Benchmarks

Protection Standard to Maintain 2011 Baseline
▶ No net loss of wetland functions on agricultural lands at a watershed scale as measured by the loss in acreage of forest cover or native vegetation within or adjacent to wetlands.
Voluntary Enhancement
▶ Increase of wetland functions on agricultural lands that existed on a watershed scale as of July 2011 as measured by a gain in acreage of forest cover or native vegetation within or adjacent to wetlands.

Critical Areas Goal #2

Voluntarily Protect and Enhance Critical Aquifer Recharge Areas

Overview

Critical aquifer recharge areas (CARA) are common on commercial agricultural lands throughout the county. These recharge areas are important for protecting groundwater quality for individual wells and a limited number of wellhead protection areas for public water systems. They also play a vital role in maintaining wetlands, rivers, and lakes.

Critical aquifer recharge areas have a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water or is susceptible to reduced recharge.

The Wildcat Creek Aquifer currently is the only designated critical aquifer for potable water supply.

To date, drinking water tests in the county have not shown appreciable nitrate levels in individual wells, indicating little to no impacts created by commercial agriculture. Previous contaminant issues associated with cranberry production have largely been addressed through implementation of best management practices before 2011 and dairies have adopted Nutrient Management Plans. Overall, the low-intensity and wide dispersal of agriculture in the county, coupled by existing fertilizer and pesticide regulations, reduce the likelihood of widespread future contamination. Current public health regulations will also provide protection measures.

However, protection of aquifer recharge areas remains important, especially for drinking wells serving individual agricultural properties. Wells providing potable water supplies on small-scale and noncommercial agricultural lands may be at the greatest risk due to a lack of knowledge or understanding about nutrient management or appropriate fertilizer and pesticide application methods. Encouraging the implementation of voluntary stewardship practices that protect water quality will be important for these agricultural operators.

Improved irrigation practices that reduce drawdown from shallow aquifers would benefit recharge of nearby wetlands and streams, particularly in those waterbodies that provide habitat to salmon during the summer months.

Action Plan

The following action plan will voluntarily protect and enhance critical aquifer recharge area functions and values:

Management objectives for protecting and enhancing wetland funcitons	Examples of stewardship practices to use
▶ Promote agricultural practices that protect potable water supplies	▪ Agrichemical handling facility (NRCS Code 309) ▪ Conservation crop rotation (NRCS Code 328)* ▪ Cover crop (NRCS Code 340)* ▪ Integrated Pest management (NRCS Code 595)* ▪ Nutrient management (NRCS Code 590)* ▪ Prescribed grazing (NRCS Code 528)* ▪ Residue & tillage management (NRCS Codes 329 & 345) ▪ Waste storage facility (NRCS Code 313) ▪ Share information on how to protect wells and promote regular water testing*
▶ Promote improved irrigation & agricultural practices that reduce groundwater consumption from shallow aquifers that recharge wetlands, rivers, and lakes	▪ Conservation cover (327)* ▪ Conservation crop rotation (328)* ▪ Dam (402)* ▪ Deep tillage (324)* ▪ Irrigation land leveling (464)* ▪ Irrigation systems, including micro-irrigation, sprinkler, surface system, & tailwater recovery (441, 442, 443, & 447)* ▪ Irrigation water management (449)* ▪ Mulching (484)* ▪ Nutrient management (590)* ▪ Ponds (378)* ▪ Residue management, reduced and no till (345 & 329)* ▪ Water harvesting catchment (636)* ▪ Watering facility (614)*

* Practices that may increase productivity and profitability

Key Plans, Studies and Reports Providing Further Guidance on CARA Management Objectives:

- ▶ Field Office Technical Guide for Grays Harbor County
- ▶ Framework and Ground/Surface-Water Interactions of the Chehalis River Basin, Southwestern Washington (page F-65)

- Critical Aquifer Recharge Areas – Guidance Document (page F-65)
- Washington Nitrate Prioritization Project (page F-65)
- Grayland Ditch: An Evaluation of the Effectiveness of Best Management Practices in Preventing Pesticides from Entering Cranberry Bog Drainage Ditches (page F-75)

Benchmarks

Protection Standard to Maintain 2011 Baseline
▶ No increase in coliform, nitrate, and pesticide levels in potable water supplies on or adjacent to agricultural lands as measured through monitoring drinking water test results available through local, state, and federal agencies.
Voluntary Enhancement
▶ Decrease in coliform, nitrate, and pesticide levels in potable water supplies on or adjacent to agricultural lands as measured through monitoring drinking water test results available through local, state, and federal agencies.

Critical Areas Goal #3

Voluntarily Protect and Enhance Fish & Wildlife Habitat Conservation Areas

Overview

Fish and wildlife habitat conservation areas (FWHCA) interweave with many agricultural properties in Grays Harbor County. While open agricultural lands support significant populations of deer, elk, and a great variety of birdlife, the county's rivers and streams take center stage as its most important FWHCA. These waters support salmon populations important to the culture and economy of the county.

Fish and wildlife habitat conservation areas are lands and waters managed to maintain populations of fish and wildlife species in suitable habitats within their natural geographic distributions. This management occurs over the long term and within connected habitat blocks and open spaces.

Protecting and enhancing functions related to habitat, water quality, and seasonal water quantity associated with rivers and wetlands on agricultural lands will provide the greatest benefit to FWHCA in the county. Approaches will vary whether it is an established agricultural operation or a new or expanding one.

VSP focus for established agricultural operations should emphasize voluntary enhancement of current conditions through practices such as improving the quality of riparian areas, reducing livestock access, removing fish passage barriers, using more efficient irrigation systems, and improving instream habitat. Indirect practices are equally important as well; these can include incorporating improved nutrient management, integrated pest management, and erosion control methods that particularly benefit water quality.

For new agricultural operations, especially small noncommercial ones, VSP needs to emphasize stewardship practices that protect existing functions before their disruption. Voluntary adoption of practices that separate agricultural activities from waterbodies need special emphasis.

Overall, preventing the conversion of agricultural lands to other, more intensive uses is a priority benefit to FWHCA.

Depending on concentrations, wildlife nuisances can significantly decrease the economic viability of commercial agricultural operations. Elk, deer, and some bird species cause extensive damage to cropland and fence lines. Predators, such as coyotes, present a threat to young and smaller-sized livestock.

FWHCA conservation/restoration projects using salmon recovery funding will not count towards the goal providing for no net loss of ecological function; salmon recovery-funded projects *may* contribute to watershed scale enhancement. The intent of this limitation is to not create an opportunity to cause harm within a watershed due to the implementing of a salmon recovery project.

Action Plan

The following action plan will voluntarily protect and enhance FWHCA:

Management objectives for protecting and enhancing wetland functions	Examples of stewardship practices to use
▶ Separating agricultural activities from FWHCA	▪ Fencing (NRCS Code 382) ▪ Integrated pest management (NRCS Code 595) ▪ Nutrient management (NRCS Code 590)* ▪ Watering facility (NRCS Code 614)* ▪ Sharing information about avoiding impacts to FWHCA
▶ Enhancing habit in FWHCA	▪ Access control (NRCS Code 472)* ▪ Alley cropping (NRCS Code 311) ▪ Aquatic organism passage (NRCS Code 396) ▪ CRP, CREP and CSP enrollment ▪ Conservation cover (NRCS Code 327) ▪ Critical area planting (NRCS Code 342) ▪ Early successional habitat development/ management (NRCS Code 47) ▪ Fencing (NRCS Code 382) ▪ Field border (NRCS Code 386) ▪ Filter strips (NRCS Code 393) ▪ Grassed waterways (NRCS Code 412) ▪ Hedgerow planting (NRCS Code 422) ▪ Herbaceous weed control (NRCS Code 315) ▪ Riparian forest buffer (NRCS Code 391) ▪ Stream habitat improvement & management (NRCS Code 395) ▪ Structures for wildlife (NRCS Code 649) ▪ Tree/shrub establishment (NRCS Code 612) ▪ Upland wildlife habitat (NRCS Code 645) ▪ Wetland enhancement & restoration (NRCS Code 659) ▪ Participate in salmon recovery organizations and projects that enhance or restore habitat
▶ Reducing conflicts between agriculture & wildlife	▪ Wildlife fencing* ▪ Food plots* ▪ Nuisance wildlife management*
▶ Retaining intact habitat for FWHCA	▪ Open Space enrollment* ▪ Conservation easements* ▪ CRP, CREP and CSP enrollment

Management objectives for protecting and enhancing wetland functions	Examples of stewardship practices to use
▶ Maintaining or increasing agricultural open space	▪ Enrollment in Open Space programs* ▪ Agricultural land protection within land use plans & development regulations*

* Practices that may increase productivity and profitability

Key Plans, Studies and Reports Providing Further Guidance on FWHCA Management Objectives:

- Field Office Technical Guide for Grays Harbor County
- Washington Coast Sustainable Salmon Plan (page F-66)
- Chehalis Basin Salmon Habitat Restoration and Preservation Strategy for WRIAs 22 and 23 (page F-67)
- Pacific County Lead Entity Strategy WRIA 24 (page F-68)
- Quinault Lead Entity Strategy WRIA 21 (page F-67)
- Stream Corridor Restoration: Principles, Processes, and Practices (page F-69)
- Threatened and Endangered Wildlife: 2012 Annual Report (page F-70)
- Recovery Plans for specific ESA listed species (pages F-26)
- Various TMDL Studies addressing best management practices for agriculture (page F-72)

Benchmarks

Protection Standard to Maintain 2011 Baseline
▶ No net loss of FWHCA functions on agricultural lands at a watershed scale as measured by: ▪ The loss or gain of acreage in forest cover or native vegetation and of impervious surfaces on FWHCA lands that intersect with agricultural lands, and ▪ No change in 303(d) listings attributable to agricultural activities. ▪
Voluntary Enhancement
▶ Increase in FWHCA functions on agricultural lands that existed on a watershed scale as of July 2011 as measured by: ▪ A gain in forest cover or native vegetation acreage or a decrease in impervious surface acreage on FWHCA lands that intersect with agricultural lands, and ▪ A decrease in 303(d) listings attributable to agricultural activities. ▪

Critical Area Goal #4

Reduce Risks from Frequently Flooded Areas

Overview

Flooding is a widespread and persistent problem for many properties in Grays Harbor County, including commercial and noncommercial agricultural lands. Some agricultural practices can reduce the function of frequently flooded areas by increasing flows, degrading soil quality, reducing the capacity of land to store floodwaters, increasing streambank erosion, and degrading fish and wildlife habitat, especially along riparian areas and in streams.

Frequently flooded areas are lands within the floodplain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater levels.

The impacts of flooding on agriculture can be devastating. In the past, high velocity floods have eroded land, damaged crops, drowned livestock, destroyed structures and fence lines, and threatened the personal safety of commercial and noncommercial agricultural operators. Finding solutions to flooding problems in many of the county's subbasins can be complex and often requires a comprehensive effort at a very large scale.

While the application of VSP stewardship practices on agricultural lands is not an answer to comprehensive floodplain management, they can reduce individual risk and contribute to a wider benefit. The focus for established commercial agricultural operations should emphasize voluntary enhancement of natural functions on their lands both through direct and indirect voluntary stewardship practices. Because agricultural land provides significant open space, it provides benefit to overall countywide flood prevention. Avoiding its conversion to other more intensive uses with increased impermeable surfaces is probably the most significant contribution to protecting frequently flooded areas.

For new or expanding commercial and noncommercial agricultural operations, both voluntary protection and enhancement practices are important. Past flood events indicate that the most important stewardship practices to emphasize are retaining and enhancing riparian corridors that will reduce flood velocities, decreasing erosion, and increasing water storage. Practices that encourage proper location of farm structures and the protection of livestock are equally important.

Retaining requirements for the National Flood Insurance Program (NFIP) within Chapter 18.06, Critical Areas Protection, within the Grays Harbor County Code will provide significant protection for life and property on agricultural lands within frequently flooded areas. The Action Plan will encourage practices that will reduce the risk of flood damage on agricultural lands and will not contradict any other laws or regulations in special flood hazard areas.

Action Plan

The following action plan will voluntarily protect and enhance frequently flooded area functions and values:

Management objectives for reducing the risk of flooding	Examples of stewardship practices to use
▶ Protect or increase water storage in floodplains	▪ Dam (NRCS Code 402)* ▪ Ponds (NRCS Code 378)* ▪ Water harvesting catchment (NRCS Code 636)* ▪ Watering facility (NRCS Code 614)* ▪ Wetland creation, enhancement, or restoration (NRCS Codes 658, 659, and 657)
▶ Reduce floodwater velocities	▪ Dam (NRCS Code 402)* ▪ Riparian forest buffer (NRCS Code 391) ▪ Riparian herbaceous cover (NRCS Code 390) ▪ Rock barrier (NRCS Code 555)* ▪ Stream habitat improvement & management (NRCS Code 395)* ▪ Tree & shrub establishment (NRCS Code 612) ▪ Waterspreading (NRCS Code 640)*
▶ Protect farm structures, equipment, & livestock	▪ Livestock & equipment pads* ▪ Raising homes & structures within floodplains* ▪ Risk reduction projects* ▪ Sharing information about flood proofing structures*
▶ Promote regionwide efforts that reduce flood damage on agricultural lands	▪ Support efforts of the Chehalis Basin Strategy to address viable solutions that promote the protection of agricultural lands from flood damage
▶ Maintain or increase agricultural acreage	▪ Enrollment in Open Space Programs* ▪ Agricultural land protection within development plans & regulations*

* Practices that may increase productivity and profitability

Key Plans, Studies and Reports Providing Further Guidance on Frequently Flooded Areas Management Objectives:

- ▶ Field Office Technical Guide for Grays Harbor County
- ▶ Stream Corridor Restoration: Principles, Processes, and Practices (page F-69)
- ▶ Governor's Chehalis Basin Work Group – 2014 Recommendation Report (page F-75)
- ▶ Comprehensive Flood Management Plans (page F-76)

Benchmarks

Protection Standard to Maintain 2011 Baseline
▶ No increase in the risk of flooding on agricultural lands at a watershed scale as measured by the loss or gain in acreage of impervious surfaces and forest cover or native vegetation within frequently flooded areas. ▶ Regulate floodplain development on agricultural lands consistent with Chapter 18.06 of the Grays Harbor County Code
Voluntary Enhancement
▶ Decrease the risk of flooding on agricultural lands at a watershed scale as measured by a decrease in the acreage of impervious surfaces and an increase in the acreage of forest cover or native vegetation within frequently flooded areas.

Critical Areas Goal #5

Voluntarily Reduce Risks from Geologic Hazardous Areas

Overview

Geologically hazardous areas are susceptible to erosion, sliding, earthquakes, tsunami, channel migration, and other geological events. Development often is not suitable in these areas due to public health or safety concerns.

The primary geologic risks facing agricultural lands in Grays Harbor County are channel migration along major rivers and earthquakes. Landslides present a limited risk to farmland located adjacent to steep slopes, especially along the high banks of the lower Chehalis River.

Channel migration is known to occur on agricultural lands frequently along all of the major river systems in the county, with its most significant impacts along the Chehalis, Satsop, Wynoochee, and Humptulips Rivers.

Except for the Satsop Valley, there are few documented studies of the problem. The reasons for channel migration are complex and not readily solved, especially at a parcel level. Situations on each of the major rivers can be unique; for instance, circumstances that encourage channel migration on the Wynoochee are different than along the Chehalis. Further efforts at understanding the reasons for channel migration and generating effective solutions is a priority.

Voluntary stewardship practices, while not fool-proof, can assist agricultural operators at lessening the potential for channel migration on their properties. These include retaining or enhancing riparian vegetation, placing soft-armoring along streambanks, and/or improving instream functions.

Landslides pose a limited risk to a small number of agricultural properties in the county, primarily in the Garrard Creek valley of the Lincoln Subbasin. Most landslide areas are forested areas on properties; the focus should be on retaining vegetative cover.

Addressing earthquake risks on agricultural lands falls more to education about the safe location of agricultural structures on properties prone to liquefaction or excessive shaking.

Action Plan

The following action plan will reduce geologic risks to agricultural lands:

Management objectives for reducing the risk of geologic harzards	Examples of stewardship practices to use
▶ Reduce bank erosion & channel migration	▪ Channel bed stabilization (NRCS Code 584) ▪ Fencing (NRCS Code 382) ▪ Heavy use area protection (NRCS Code 561)

Management objectives for reducing the risk of geologic harzards	Examples of stewardship practices to use
	▪ Hedgerow planting (NRCS Code 422) ▪ Riparian forest buffer (NRCS Code 391) ▪ Riparian herbaceous cover (NRCS Code 390) ▪ Stream habitat improvement & management (NRCS Code 395) ▪ Streambank & shoreline protection (NRCS Code 580) ▪ Watering facility (NRCS Code 614)* ▪ Participate in studies or projects that explore comprehensive approaches for addressing channel migration on agricultural lands* ▪ Sharing information about locating structures in suspected channel migration & erosion areas*
▶ Minimize erosion & sedimentation	▪ Channel bed stabilization (NRCS Code 584) ▪ Conservation cover (NRCS Code 327) ▪ Conservation crop rotation (NRCS Code 328)* ▪ Contour buffer strips & farming (NRCS Codes 332 & 330)* ▪ Cover crop (NRCS Code 340) ▪ Filter strips (NRCS Code 393) ▪ Grassed waterways (NRCS Code 412) ▪ Mulching (NRCS Code 484) ▪ Prescribed grazing (NRCS Code 528) ▪ Water & sediment control basin (NRCS Code 638)* ▪ Channel migration easements to keep rivers connected to floodplains
▶ Reduce landslide potential	▪ Range planting (NRCS Code 550) ▪ Tree/shrub establishment (NRCS Code 612) ▪ Appropriate farm design and land utilization*
▶ Minimize earthquake risk	▪ Sharing information on earthquake risk & building codes*

* Practices that may increase productivity and profitability

Key Plans, Studies and Reports Providing Further Guidance on Geologically Hazardous Areas Management Objectives:

- Field Office Technical Guide for Grays Harbor County
- Stream Corridor Restoration: Principles, Processes, and Practices (page F-69)
- Grays Harbor County Comprehensive Flood Management Plans (page F-76)

Benchmarks

Protection Standard to Maintain 2011 Baseline
▶ No increase in risk of geologic hazards on agricultural lands at a watershed scale as measured by the loss or gain in acreage of forest cover or native vegetation.
Voluntary Enhancement
▶ Decrease the risk geologic hazards on agricultural lands that existed on a watershed scale as of July 2011 as measured by a gain in forest cover or native vegetation.

Agricultural Viability Goal #1

Ensuring the Preservation of Historic Farmland

Overview

Grays Harbor County has an established history in preserving agricultural lands. However, continued efforts are necessary to ensure that agriculture lands continue to prosper into the future.

Agriculture should remain a priority in those areas zoned for that use. Future development in these areas need to ensure they do not disrupt or hamper farming operations, including those farms seeking to diversify through agritourism. The county's Right-to-Farm laws also need to account for impacts to rural infrastructure, such as roads, that affect agricultural operations.

Incentives, such as the Open Space Taxation Act, are important for keeping agriculture on the land. The program is more than simply a way of reducing the tax burden on farm operators; it keeps agricultural land affordable for purchase for farming and assures the use and enjoyment of natural resources and scenic beauty for the economic and social well-being of all citizens. Current management of the Open Space program in the county, however, is a concern for many farmers. Some find it difficult to enroll under the program while others find it difficult to stay in. Still yet, others say that there should be a lower threshold for enrollment.

Making available other incentives for agriculture in the county would help as well. This includes taxing incentives on a state and federal level; cost shares for farmers implementing best management practices; and establishing conservation measures, such as easements.

Action Plan

The following action plan aims at preserving farmland and promoting its affordability:

Viability Objectives	Examples of stewardship activities
▶ Keep agricultural lands in production	▪ Participation on county planning commission to support protection of agricultural lands through the comprehensive plan and zoning ▪ Sponsor seminars focusing on how to enroll in Open Space programs ▪ Work with County Assessor to improve the Open Space program enrollment process ▪ Investigate development of a program for purchasing development rights and/or establishing an agricultural land trust program ▪ Provide comment to the county on development proposals that could affect agricultural operations

Agricultural Viability Goal #2

Encouraging Innovation & Technology

Overview

Advances in innovation and technology will contribute to the viability of farming in the county by increasing overall productivity and improving land stewardship. Augmenting current agricultural outreach efforts will be essential for transferring this knowledge to both commercial and noncommercial farmers.

Action Plan

The following action plan promotes encouraging innovation and technology:

Viability Objectives	Examples of stewardship activities
▶ Encourage the adoption of agricultural innovations and technologies that increase overall productivity & profitability	▪ Provide information to agricultural operators regarding high-yielding crop varieties & techniques ▪ Organize & host seminars focusing on how geographic information systems (GIS), global positioning systems (GPS), and remote sensing (RS) can improve nutrient and water management systems ▪ Support public funding efforts for research & development programs that improve agricultural viability & environmental protection, such as the manure-to-water technology project ▪ Encourage collaboration among agricultural operators to share information, resources, & equipment that contribute to greater agricultural viability & environmental protection ▪ Facilitate relationships with public & private sector organizations who can share information about innovation & technology improvements, such as Department of Agriculture, Monsanto, The Fertilizer Institute, Grays Harbor College, & Washington State University

Agricultural Viability Goal #3

Promoting & Marketing Grays Harbor Agriculture

Overview

Our county's agricultural base is not only diverse, but it has room to grow. New products, agricultural fairs, and agritourism will help fuel our ability to connect with local, regional, national, and perhaps even international markets. County agriculture needs to "Tell the Story."

The success of this effort will depend on organized promotion, education, and outreach to both the commercial and noncommercial farm community. WSU Extension, as an information and organizational resource center, should be a key player in making this strategy a reality.

Action Plan

The following action plan promotes promoting and marketing Grays Harbor agriculture:

Viability Objectives	Examples of stewardship activities
▶ Promote local farm markets	▪ Support & expand the Farm Fresh program through Grays Harbor Tourism[5] ▪ Work with Greater Grays Harbor, Inc. to promote markets for local products in nearby urban areas
▶ Encourage new agricultural production in county	▪ Work with Greater Grays Harbor, Inc. & other business development organizations to help new or growing commercial agricultural operations[6] ▪ Promote information about agricultural properties for sale or lease to encourage new producers to locate within the county

Agricultural Viability Goal #4

Educating & Recruiting our Next Farmers

Overview

Education is critical for recruiting our next generation of new farmers. We need to revitalize programs like 4-H and FFA that teach and promote young people's interest in agriculture as a career. As new farmers become established, sharing knowledge through mentoring programs will promote their success and contribution to our local community and economy. Finally, as the farmer ages, assistance in succession planning will aid in securing a financially stable retirement in a way that recycles the land back into agriculture.

Action Plan

The following action plan promotes educational programs, projects, and technical assistance:

Viability Objectives	Examples of stewardship activities
▶ Enhance existing programs and create new avenues for agricultural education	▪ Promote 4-H and FFA programs throughout the county by sharing information through literature or presentations ▪ Create a mentor program that links established farmers with commercial & noncommercial newcomers ▪ Encourage Grays Harbor College to increase the number of classes teaching about agriculture ▪ Explore with other nearby county VSP Work Groups the potential for establishing an organization like the Northwest Agriculture Business Center for the southwest region[7]

Agricultural Viability Benchmark #5

Protecting Agricultural Water Rights

Overview

Despite the wetness of winter, Grays Harbor County summers can be dry. Many crops, hay, grass, and pasture land are heavily depended on irrigation. In many areas of the county, obtaining new water rights is difficult, if not impossible. This is a limiting factor to the future growth of farms, their productivity, and product diversification.

Action Plan

The following action plan promotes agricultural water rights:

Viability Objectives	Examples of stewardship practices to use
▶ Protect agricultural water rights	▪ Participate in county and regional watershed planning efforts*
▶ Increase water storage	▪ Dam (402)* ▪ Mulching (484)* ▪ Ponds (378)* ▪ Water harvesting catchment (636)* ▪ Watering facility (614)* ▪ Wetland creation, enhancement, or restoration (658, 659, & 657)*
▶ Improve irrigation systems	▪ Deep tillage (324)* ▪ Irrigation land leveling (464)* ▪ Irrigation water management (449)* ▪ Irrigation systems, including micro-irrigation, sprinkler, surface system, & tailwater recovery (441, 442, 443, & 447)*
▶ Implement stewardship practices that reduce irrigation consumption	▪ Conservation cover (327)* ▪ Conservation crop rotation (328)* ▪ Integrated pest management (595)* ▪ Nutrient management (590)* ▪ Residue management, reduced and no till (345 & 329)*

*Practices that may increase productivity and profitability

Agricultural Viability Goal #6

Controlling Invasive Species

Overview

Non-native plants and animals create a heavy burden on both the environment and agriculture. A comprehensive eradication and outreach prevention program for invasive species is essential for increasing the efficiency and productivity of county agriculture and aquaculture. Such a program is especially important for aiding the small, noncommercial farmer who may lack the knowledge to recognize and control invasive species.

Action Plan

The following action plan aimed at controlling invasive species:

Viability Objectives	Examples of stewardship practices to use
▶ Identify & control invasive species on agricultural & aquaculture operations	▪ Herbaceous weed treatment (NRCS Code 315)* ▪ Promote greater funding availability to local programs focused on controlling invasive species ▪ Increase the distribution of information on controlling invasive species, especially to noncommercial agricultural properties ▪ Support the Noxious Weed Control Board

* Practices that may increase productivity and profitability

Agricultural Viability Goal #7

Reduce Potential Impacts to Critical Areas by Small-scale and Noncommercial Agricultural Operators

Overview

Small-scale and noncommercial agriculture can be a rewarding experience for rural residents, whether doing it for their own food source, supplementing household income, or strictly for pleasure. Done well, they can coexist and sustain the environment. Done poorly, they can exact a toll on the ecosystem that extends well beyond their footprint.

Small-scale and noncommercial agricultural operators within the Work Plan occur on properties not classified under Land Use Codes 82, 83, 84.96, and 86.97 by the County Assessor. Currently, the location, number, size, and characteristics of these operations is unknown.

Critical areas are vulnerable to degradation from inadvertent practices by the occasional well-meaning but unskilled residential agricultural operator. While their small size often allows their operations to go unnoticed, collectively they can have a significant impact on the environment. The most frequently cited examples of these concerns relate to over-grazed pens, uncontrolled livestock access to critical habitat, excessive sediment run-off, poor nutrient and fertilizer management, inadequate control of invasive species, and potential drinking well contamination.

Reaching out to these small-scale and noncommercial agricultural operators can be difficult. They often come and go over time and are hard to locate. Small-scale and noncommercial agricultural activities are indistinguishable under the County Assessor's rolls because of their residential, rather than agricultural, land use classification. They often occur on small parcels five to ten acres in size. Regardless of their small size or noncommercial status, these agricultural activities come under the VSP legislation as any large-scale, commercial operation.

The Work Plan acknowledges there may be unique challenges to maintaining the July 2011 baseline, given potential growth of small-scale and noncommercial agriculture in the county. Commercial agricultural operators have expressed their concern about how these agriculture activities could impact long-term participation of the county under VSP. In addition, they have mentioned potential spillover impacts of poor agricultural practices on the viability of their own operations. For these reasons, the Work Plan places special emphasis on the importance of reaching out to small-scale and noncommercial agricultural operators in the county. Ideally, the Work Group will aim to connect with property owners before they establish agricultural activities on the landscape.

Action Plan

The following action plan aims at reducing potential impacts on critical areas by small-scale and noncommercial agricultural operators:

Viability Objectives	Examples of activities to implement
▶ Learn more about the number & location of small-scale & noncommercial agriculture in the county	▶ Create an active database with information about the number, location, & characteristics of small-scale and noncommercial agricultural operations in the county ▶ Establish a program that encourages small-scale & noncommercial agricultural operators to self-register with the Grays Harbor Conservation District for information & incentives
▶ Inform small-scale and noncommercial agricultural producers about VSP	▶ Inform community groups and organizations engaged in small-scale and noncommercial agriculture about VSP through presentations, flyers, and articles in organization newsletters ▶ Advertise VSP at feed and garden stores frequented by small scale farmers ▶ Keep real estate offices, landscapers, and contractors informed about VSP benefits for their clients
▶ Build the agricultural skills of small-scale and noncommercial agricultural operators	▶ Connect knowledgeable mentors with noncommercial operators ▶ Offer free classes in farm planning and operation ▶ Create website pages and videos that teach basic farming practices on or near critical areas

Table 1: Summary of Critical Area Goals, Action Plans, and Benchmarks

Critical Area Goal	Action Plan	Protection Benchmark	Enhancement Benchmark	Monitoring Tool & Frequency
Voluntarily protect and enhance Wetland Functions and Values	► Separate agricultural activities from wetlands ► Enhance functions & values adjacent to & in wetlands ► Protect existing or create new wetlands	► No Net Loss of wetland functions on agricultural lands at a watershed scale as measured by the loss or gain in acreage of wetland area or riparian vegetation.	► Increase wetland functions on agricultural lands that existed on a watershed scale as of July 2011 as measured by a gain in acreage of wetland area or riparian vegetation	Monitor the status of the 2011 Baseline every two years through aerial imagery Review stewardship practices implemented at quarterly meetings
Voluntarily protect and enhance Critical Aquifer Recharge Areas	► Promote agricultural practices that protect potable water supplies ► Promote improved irrigation & agricultural practices that reduce groundwater consumption from shallow aquifers that recharge wetlands, rivers, and lakes	► No increase in coliform, nitrate, and pesticide levels in potable water supplies on or adjacent to agricultural lands as measured through monitoring drinking water test results available through local, state, and federal agencies	► Decrease in coliform, nitrate, and pesticide levels in potable water supplies on or adjacent to agricultural lands as measured through monitoring drinking water test results available through local, state, and federal agencies.	Review County, state, federal & private drinking water test reports annually
Voluntarily protect and enhance Fish & Wildlife Habitat Conservation Areas	► Separate agricultural activities from FWHCA ► Enhance habit in FWHCA ► Reduce conflicts between agriculture & wildlife ► Retain intact habitat for FWHCA ► Maintain or increasing agricultural open space	► No Net Loss of FWHCA functions on agricultural lands at a watershed scale as measured by the loss or gain of acreage in riparian forest cover and impervious surfaces and the increase or decrease in 303(d) listings.	► Increase FWHCA functions on agricultural lands that existed on a watershed scale as of July 2011 as measured by a gain in riparian forest cover acreage, a decrease in impervious surface acreage, and a decrease in 303(d) listings	Monitor the status of the 2011 Baseline every two years through aerial imagery Review stewardship practices implemented at quarterly meetings

Critical Area Goal	Action Plan	Protection Benchmark	Enhancement Benchmark	Monitoring Tool & Frequency
Reduce Risks from Frequently Flooded Areas	► Protect or increase water storage in floodplains ► Reduce floodwater velocities ► Protect farm structures, equipment, & livestock ► Promote regionwide efforts that reduce flood damage on agricultural lands ► Maintain or increase agricultural acreage	► No increase in risk from frequently flooded areas on agricultural lands at a watershed scale as measured by the loss or gain in acreage of impervious surfaces and riparian land cover ► Regulate floodplain development on agricultural lands consistent with Grays Harbor County Code Chapter 18.06	► Decrease the risk of frequently flooded areas on agricultural lands at a watershed scale as measured by a decrease in the acreage of impervious surfaces and an increase in the acreage of riparian land cover	Monitor the status of the 2011 Baseline every two years through aerial imagery Review stewardship practices implemented at quarterly meetings
Reduce Risks from Geologic Hazardous Areas	► Reduce bank erosion & channel migration ► Minimize erosion & sedimentation ► Reduce landslide potential ► Minimize earthquake risk	► No increase in risk of geologic hazards on agricultural lands at a watershed scale as measured by the loss or gain in acreage of vegetative land cover	► Decrease the risk geologic hazards on agricultural lands that existed on a watershed scale as of July 2011 as measured by a gain in vegetative land cover	Monitor the status of the 2011 Baseline every two years through aerial imagery Review stewardship practices implemented at quarterly meetings

Table 2: Summary of Agricultural Viability Goals, Action Plans, and Benchmarks

Ag Viability Goals	Action Plan	Monitoring Approach
Ensuring the preservation of historic farmland	• Keep agricultural lands in production	• Quarterly reporting at Work Group meetings on activities
Encouraging innovation & technology	• Encourage the adoption of agricultural innovations and technologies that increase overall productivity & profitability	• Quarterly reporting at Work Group meetings on activities
Promoting & marketing Grays Harbor agriculture	• Promote local farm markets • Encourage new agricultural production in county	• Quarterly reporting at Work Group meetings on activities
Educating & recruiting our next farmers	• Enhance existing programs and create new avenues for agricultural education	• Quarterly reporting at Work Group meetings on activities
Protecting agricultural water rights	• Protect agricultural water rights • Increase water storage • Improve irrigation systems • Implement stewardship practices that reduce irrigation consumption	• Quarterly reporting at Work Group meetings on activities
Controlling invasive species	• Identify & control invasive species on agricultural & aquaculture operations	• Quarterly reporting at Work Group meetings on activities
Reduce potential impacts to critical areas by small-scale, noncommercial agricultural operators	• Inform small-scale and noncommercial agricultural producers about VSP • Build the agricultural skills of small-scale or noncommercial agricultural operators	• Quarterly reporting at Work Group meetings on activities

Chapter Three
Work Plan Implementation

Implementation of the Grays Harbor Work Plan will be a partnership between the Work Group, the Grays Harbor Conservation District (GHCD), and Grays Harbor County. The Washington State Conservation Commission (WSCC) also plays an important role in providing funding for implementing VSP within the county.

This chapter describes the specific roles of each partner engaged in Work Plan implementation.

VSP Work Group

Responsibilities

The role of the Grays Harbor Work Group will be to lead Work Plan implementation by:

1. Setting priorities, designing strategies, and directing resources for achieving Work Plan goals and benchmarks;
2. Providing oversight of the technical provider's efforts in providing VSP support;
3. Monitoring Work Plan progress in implementing goals and benchmarks;
4. Adaptively managing the Work Plan if monitoring reveals implemented stewardship practices are falling short of goals and benchmarks;
5. Meeting VSP reporting requirements to Grays Harbor County and WSCC; and
6. Working with and encouraging partner organizations and governmental agencies to implement goals, benchmarks, and monitoring efforts.

Membership

The Work Group will have nine members from the agricultural community. The goal is to recruit members representing the diversity of agriculture in the county. The Work Group may increase or decrease in membership as long there is an odd number of members.

Five members initially will have two-year terms and four will have one-year terms, chosen by lot. After completion of their first term, all members thereafter will serve two-year terms.

Whenever a vacancy occurs on the Work Group, members will recruit individuals to apply for the position. At the next regular meeting, the Work Group will consider all applicants and then select by majority vote who should fill a vacant position.

The Work Group will have Chair and Vice-Chair as officers. The Chair will be responsible for running Work Group meetings, and in the Chair's absence, the Vice-Chair.

All Work Group members are volunteers and do not receive compensation for their service. However, members may be reimbursed for actual expenses incurred for attending trainings or state meetings approved by the Work Group.

Meetings

The Work Group will meet in February, May, September, and November. The Work Group will have minutes for each meeting and shall be consistent with the Open Public Meeting Act. A quorum for a meeting is a simple majority of members in attendance, whether in person or by teleconference.

Work Group members will consider all opinions and ideas offered during meetings. Decisions require a simple majority of members participating at meetings.

The quarterly meetings will be particularly important for monitoring reports from the Conservation District regarding outcomes from Individual Stewardship Plans, participation rates, and protection and enhancement of critical areas. The Work Group will adaptively manage the plan at these meetings as described in Chapter Five.

Advisory Committee

The Work Group may appoint a non-voting Advisory Committee to assist or provide advice on specific issues. Advisory Committee members typically have specialized technical or policy expertise from nonprofit organizations and local, state, federal, and tribal governments. Examples include representatives from NRCS, Grays Harbor County, ECY, WSDA, lead entity organizations, and the Quinault Indian Nation. There is no term for Advisory Committee members.

Grays Harbor Conservation District (GHCD)

Primary Designated Technical Provider

GHCD will be the primary designated technical provider to support the Work Group in the implementation of the Work Plan. GHCD board members may also serve as Work Group members. GHCD will work in partnership with the Work Group to fulfill the responsibilities outlined below.

Responsibilities

1. Fielding inquiries from prospective participants about VSP;

2. Providing outreach and technical assistance, including preparation of Individual Stewardship Plans to commercial, small-scale, and noncommercial agricultural operators;

3. Linking agricultural operators with other secondary technical providers for technical and financial assistance;

4. Inventorying stewardship practices implemented on agricultural lands within the county by WRIA;

5. Preparing and distributing outreach materials that encourage VSP participation;

6. Maintenance of website and social media outreach;

7. Planning and running outreach events;

8. Helping the Work Group in:
    - Coordinating, planning, and facilitating quarterly meetings
    - Preparing meeting minutes
    - Communication and coordination with other entities
    - Assisting in setting annual goals

9. Interpreting landscape changes from change detection aerial imagery provided by Grays Harbor County;

10. Preparing quarterly reports for the Work Group regarding number of Individual Stewardship Plans completed and stewardship practices implemented by WRIA;

11. Preparing draft two- and five-year status reports for the Work Group's review and approval;

12. Building partnerships with secondary technical providers for:
    - Collecting information on stewardship practices implemented in each WRIA
    - Providing technical assistance
    - Making financial incentives available for stewardship practices;

13. Writing and administering grants that increase VSP resources for providing technical and financial assistance;

14. Preparing quarterly reports and monthly reimbursement invoices for Grays Harbor County review and approval; and

15. Attending regional meetings on related projects.

Grays Harbor County

The partnership role Grays Harbor County plays in the VSP process entails:

1. Serving as the contracting and fiscal agent between WSCC, the Work Group, and GHCD[8]
2. Reviewing and approving contracts and invoices submitted by GHCD and the Work Group
3. Assisting the Work Group in the development of annual budgets
4. Providing GIS support for monitoring landscape changes on agricultural lands using aerial imagery for interpretation by GHCD

Grays Harbor County representatives will attend quarterly Work Group meetings to continue to track VSP progress and provide technical advice when requested.

Secondary Technical Providers

The Work Group intends to encourage many agencies and non-governmental organizations to participate in VSP. These secondary technical providers will play a critical part by injecting financial and technical assistance towards implementing the Work Plan. These relationships can be beneficial in both a direct and indirect way for VSP.

The Work Group and GHCD will build close working relationships with entities like NRCS, FSA, WSU Extension, the Coast Salmon Partnership, the Chehalis Basin and Willapa Bay Lead Entities, and the network of land trusts. These entities have access to significant resources for achieving critical area Work Plan goals and benchmarks. In addition, it will be important to keep track of the stewardship practices implemented by these agencies even when there is no direct VSP involvement. All efforts completed by these technical providers count towards maintaining the July 2011 baseline for critical areas.

Other secondary technical providers will be especially important in implementing many of the agricultural viability goals and benchmarks in the plan. Organizations such as the Washington Farm Bureau, the Grays Harbor and Pacific County Farm Bureau, Washington State Dairy Federation, and Greater Grays Harbor can contribute or even take the lead on many of these projects.

Foundations through their charitable giving programs may eventually provide a source of funding for one-time projects aimed at implementing goals as well as outreach and participation programs.

Finally, the Work Group and GHCD periodically may contract with secondary technical providers to perform short-term tasks, such a website development, marketing materials, and specialized presentation programs.

Chapter Four

Outreach and Participation

The success of the Work Plan in achieving its critical area and agricultural viability goals and benchmarks relies on the ability of the Work Group and GHCD to connect with commercial, small-scale, and noncommercial agricultural producers to implement the Work Plan benchmarks. In addition to setting goals for participation, this chapter discusses some key extension outreach concepts and identifies specific strategies for implementing the Work Plan. An outreach and participation action plan complete the chapter by setting measurable objectives for the initial the 2018-2020 biennium.

Participation Goals

The Work Plan adopts the following goals for participation by agricultural operators conducting commercial and noncommercial activities in the county's watersheds to meet the protection and enhancement benchmarks in Chapter 2:

- Reach out and share information with all citizens, especially those engaged in agricultural activities, about the purpose and intent of VSP
- Provide useful knowledge in "plain speak" about voluntary stewardship practices on agricultural lands that protect and enhance critical areas
- Promote the adoption and implementation of Individual Stewardship Plans by commercial and noncommercial operators that benefit critical areas and promote the economic viability of their operations
- Target agricultural operators for outreach and participation that will deliver the greatest potential for improvement to critical areas within a watershed
- Engage citizens involved in agricultural activities in programs and activities that improve the future viability of agriculture in Grays Harbor County
- Be patient, realistic, and manage expectations about VSP participation during its introductory period

Outreach Concepts

Outreach is the process of building interest within the agricultural community for VSP and showing how it can improve their success. It emphasizes the positive impacts of participation - gaining new knowledge and skills as well as increasing awareness about the benefits of critical areas for agriculture. Because VSP is voluntary, effective outreach, especially the quality and content of the message, is essential to opening the door to participation.

Keeping VSP flexible and focused on the individual producer will be the key to participation. It recognizes that each producer has unique motivations, ideas, and needs for their land. Flexibility also acknowledges that each agricultural property and the activities on it have distinctive characteristics in relation to critical areas. One size does not fit all.

Agricultural extension literature emphasizes several key points that are worthy of consideration when expecting voluntary participation in VSP and the implementation of the Work Plan's benchmarks.

- Motivation. Reasons for participation will vary from one individual to the next. While good stewardship of their land is foremost in the mind of most agricultural producers, the voluntary protection and enhancement of critical areas are often subservient considerations in relation to the long-term viability and survival of the operation itself. The reality is that many VSP stewardship practices are mutually beneficial to both agriculture and critical areas. By understanding an individual's motivations, it becomes easier to connect on a personal level the importance of operational sustainability with VSP voluntary protection and enhancement benchmarks.

- Participation progresses through stages. In general, VSP implementation should expect that individual adoption rates for stewardship practices will be slower at first but can gain ground as trust and success increases. Adoption of practices must prove to be:
    - Economically feasible;
    - Observable, simple to use, and divisible into manageable parts;
    - Compatible with the producer's beliefs, ideas, and management style; and
    - Flexible, easily fitting into the producer's management of the operation.

Producers often go through a trial period to evaluate a practice before fully adopting it. In terms of implementing VSP voluntary protection and enhancement stewardship practices, initial use of the practice may not always conform to accepted standards.[9]

- Consider the potential for barriers. There will be many obstacles that will affect the capacity of VSP to implement benchmarks. Primary among them will be:
    - Organizational barriers caused by the lack of coordination between and among agencies providing incentive programs, including limited resources;
    - Many producers will lack the personal funds or equipment for cost share programs;

- Landlord-tenant relationships may inhibit the installation and maintenance of long-term stewardship practices and improvements;
- Respecting confidentiality of farm operations; and

- Seek to prioritize participation that will provide the most long-term benefit to the watershed. While it is difficult to anticipate the level of enthusiasm for VSP over time, the Work Group should seek to prioritize outreach efforts to those agricultural operators with lands that will deliver the greatest improvement to critical areas in the watershed. Outcomes from the on-going monitoring program discussed in Chapter 5 will help identify these priorities as will available funding opportunities.

Keeping these factors in mind, the Work Group has adopted a simple and effective strategy to encourage agricultural producers to implement voluntary stewardship practices on their land. It relies on a combination of individual stewardship plans, leveraging resources, and recognition. The GHCD will play a significant implementation role within each facet of the program.

Outreach & Participation Strategies

The Grays Harbor County VSP Work Group will be the lead messenger for the Work Plan's outreach effort. This is important for building trust in VSP within the agricultural community as the people farmers trust most are other farmers. Assisting the Work Group in the implementation of its outreach message will be the Grays Harbor Conservation District (GHCD), another trusted entity within the agricultural community.

- Pioneer Participants. The Work Group initially will pursue a focused outreach strategy targeting the recruitment of a group of individuals from the commercial, small-scale, and noncommercial agricultural community who can serve as 'ambassadors' for the program. Preferably, these are respected leaders in the community who are prone to be early adopters of innovative practices and willing to share their VSP experiences publicly with others. Their assistance will be invaluable at hosting field demonstrations, sharing testimony, or allowing their operations to be featured on the website.[10]

Individual Work Group members, along with GHCD representatives, will be crucial in recruiting these participants. This can happen through one-on-one contact, presentations at targeted groups, or working through organizations who are supportive of VSP, such as the Farm Bureau. It will be important to have literature, a website, and a clear marketing message available by this time.

Eventually once a 'core group' is on-board, the Work Group can shift to recruiting tactics that aim at a wider audience. Not only will there be Work Group members and GHCD representatives to aid in this process, but there should be 'ambassadors' to

augment the effort. This will be particularly helpful in establishing a Farmer-to-Farmer Network.

- Passive information dissemination. A VSP website will be a focal point of this effort. It will have the most extensive information available about the program, including how the program works, how to get involved, featured practices and farms, and links to resources. In addition, there will be a series of pamphlets that share information about VSP, the services it provides, and the intersection of critical areas and agricultural activities. The focus of pamphlets will vary – emphasis especially will be directed to the numerous noncommercial agricultural producers.

- Presentations. Work Group members and GHCD representatives will play an important role in sharing information about VSP to local agricultural organizations and groups on a personal, interactive level to encourage participation. Examples of organizations include the Farm Bureau, Grays Harbor County Table, Beekeeper's Association, Master Gardeners, Grange Halls, and Back Country Horsemen. Having a 'human approach' to marketing VSP will greatly voluntarily enhance the chances of recruiting people into the program.

- Direct marketing. Using GIS information that matches critical area locations with known agricultural lands, the Work Group can selectively market to specific agricultural producers. In addition, kiosks will distribute information at select locations that target agriculture – particularly noncommercial agriculture – such as farm and feed stores in the county.

- Events. The Work Group will sponsor or participate in events that reach out to the agricultural community. This may include manned or unmanned booths at the county fair or other community events. Over time, provided the availability of volunteers, the Work Group may host field demonstrations for highlighting voluntary protection and enhancement stewardship practices.

- Farmer-to-Farmer Network. This approach relies on a team of respected, practicing farmers participating in VSP who are willing to make themselves available to chat with other farmers about the program. This is a critical marketing piece for those individuals considering VSP participation or evaluating the benefits of stewardship practices. There should be network contacts for commercial and noncommercial agricultural producers, including those who have access to niche groups, such as horse owners.

- Site visits. Site visits are probably the most effective outreach method that can lead to participation. They allow a one-on-one approach to marketing VSP to agricultural producers. Site visits may include developing an Individual Stewardship Plan (see next section) or simply an opportunity to discussing potential interest in VSP at some level.

- Building partnerships. The Work Group, along with the assistance of GHCD, will groom partnerships with other agricultural and environmental organizations for reaching out to their memberships. Partnerships will be helpful in accessing mailing lists, obtaining VSP endorsement, and providing a platform for recruiting membership into VSP. Another benefit of building partnerships is the potential for leveraging funding and technical resources for conservation practices or the collection of information about conservation practices implemented on lands through programs by other organizations or agencies.

- Recognition. Agricultural producers who participate in implementing conservation practices deserve public recognition for their stewardship contributions to the community and the land. Participation in the recognition program is voluntary and it acknowledges several levels of participation in VSP:

    - The VSP Achievement Level recognizes any agricultural producer who completes an Individual Stewardship Plan. A small sign will be available that can be displayed on the property.

    - The VSP Gold Level recognizes agricultural producers who have implemented conservation practices on their property since July 2011, regardless if they have an Individual Stewardship Plan or whether they completed them on their own or through the assistance through another program. Again, a small sign will be available that can be displayed on the property.

    - The Work Group will give an Annual Achievement Award to the agricultural producer who deserves special recognition for the scope and extent of their implementation of conservation practices.

  The recognition program will be invaluable for elevating the profile within the community of VSP and its successes.

- Individual Stewardship Plans (ISP). The "flagship" of the VSP participation strategy will be the Individual Stewardship Plan (ISP). In its simplest form, the ISP is both an information sharing process and a documentation of the conversation between the GHCD representative and an individual producer about the potential for implementing a comprehensive and effective approach to stewardship practices on the land. It connects the agricultural producer to the implementation of the goals and benchmarks within the Work Plan.

  Foremost to keep in mind about an ISP:

    - The agricultural producer designs the ISP with the assistance of the GHCD representative;

- Because the ISP is a specialized element to farm plans, it remains a confidential document; and
- The ISP puts no obligations on the agricultural producer to implement any of the recommendations in it.

The ISP also will serve an important tool for the Work Group for collecting information in an aggregate format about conservation practices being implemented within a watershed. This means that the only information the Work Group will be using from an ISP is what has been accomplished within a watershed – there will be no information collected and shared that is attributed to an individual agricultural producer.

The following steps describe the general process about developing ISPs:

- Invitation. To begin the ISP process, an agricultural producer must invite a GHCD representative to the property. Invitations typically will be a result of the outreach strategy used by the Work Group and GHCD. If helpful, a VSP 'ambassador' can tag along.

- Information sharing. The information sharing process is a two-way conversation between the GHCD representative and the producer. It begins with the GHCD representative bringing information handouts about VSP and any known information about suspected critical areas on the property. As the GHCD representative and the agricultural producer tours the property, the conversation may cover:
    - Farming, ranching or other land management objectives;
    - Anticipated changes in practices that might impact critical areas;
    - Natural resource and critical area concerns and opportunities;
    - Past conservation practices implemented by the agricultural producer on the property;
    - Conservation practices that protect or voluntarily enhance critical areas;
    - Conservation practices that can increase productivity and profitability; and
    - How VSP and the ISP can assist the operation.

As the conversation continues, the GHCD representative will process the information shared, verify the presence of critical areas on the property, and begin considering which benchmark strategies are applicable to the agricultural producer and the property. This in turn will aid the GHCD representative in suggesting possible recommendations for conservation practices. If there is

interest on the part of the agricultural producer, the GHCD representative will return to the office to prepare a draft ISP using the general format in Appendix B.

- Preparation of the ISP document. The ISP may provide general information about the location of critical areas on the property, how to protect or voluntarily enhance them, descriptions of conservation practices the agricultural producer may be interested in trying, actions that can benefit the viability of their operation, and a list of contacts and resources available for assistance. The ISP will particularly emphasize how the Work Group and GHCD can assist in the implementation of stewardship practices. Once complete, GHCD will deliver the document to the agricultural producer for potential implementation. The pace of that implementation, if any, is solely up to the agricultural producer.

  If the agricultural producer has interest in receiving information about certain conservation practices but decides not to participate in an ISP, the GHCD representative can simply leave information sheets, such as standard print-outs available through NRCS or other sources on specific practices.

- Linking resources to the ISP. For some agricultural producers, access to financial and technical resources will be essential for implementing potential conservation practices, whether it be for protecting or enhancing critical areas, ensuring agricultural viability, or both. The Work Group and GHCD will strive to connect agricultural operators with the resources they need.

  While it is expected that resources from within the state's funding allocation for VSP efforts will outstrip demand, the Work Group and GHCD will seek to leverage or channel other resources from private, local, state, and federal sources. A list of these potential resources is in Appendix D.

- On-going consultation. An ISP is never a "final document;" it may continue to evolve overtime as the agricultural operator becomes more interested in expanding recommended conservation practices or adopting new ones. Other issues may also arise that were not addressed in a previous ISP.

  The GHCD representative can keep the VSP process alive by continuing to work with the agricultural producer through a regular, on-going consultation process. All consultations remain confidential. Whether that involvement entails updating the ISP as efforts move forward, linking new resources to conservation practices, or simply giving advice on inquiries, keeping communication channels open is essential for keeping the agricultural producer engaged in VSP. All consultations between the GHCD representative and the agricultural producer remain confidential.

  On-going consultation also is essential for tracking benchmarks. For those agricultural operators who implement conservation practices entirely with their

own resources, invited field visits may be the only way for the Work Group to learn about what has been accomplished.

- Providing Non-ISP Assistance. There will be agricultural producers who may be interested in participating in VSP at a limited level and who do not want to complete an ISP. Their reasons may vary from needing only very limited assistance to concerns about maintaining privacy.

  While preparing an ISP is the ideal comprehensive approach to enhancing critical areas on agricultural lands, the Work Group maintains it is more important to get voluntary enhancement projects accomplished. Therefore, the Work Group will provide the same level of service to producers who do not want an ISP.

Documenting the Work of Others

While VSP is a great new initiative for agricultural producers, it has not been, nor will it be, the only resource program encouraging good stewardship practices on agricultural lands. Individual agricultural producers, conservation districts, local governments, state and federal agencies, and nonprofit organizations all have a long history of implementing good stewardship practices on agricultural lands that benefit the functions and values of critical areas.

VSP will become an excellent tool for "telling the story" about how much work and progress agricultural producers are accomplishing in relation to protecting and enhancing critical areas. Documenting this work will be critical in negating public misconceptions about agriculture's impact on these lands.

GHCD will assist the Work Group in this effort by collecting and regularly publishing through its outreach media stewardship efforts accomplished by the agricultural community. They can accomplish this by organizing and maintaining lines of communication with resource providers to collect this information on an aggregate and watershed level. While it will be difficult to secure information about stewardship practices implemented by individual agricultural producers, GHCD will seek to document their work as well. This may require special outreach efforts to these individuals or working through organizations they may hold membership in.

This information will also be shared with the Work Group on a quarterly basis as part of the monitoring process covered in Chapter Five.

Outreach and Participation Action Plan

Appendix C contains a list of stewardship practices implemented during the 2011-2017 period. While NRCS data provides the number of contracts, it does not reveal the number of unduplicated individuals receiving assistance.

There are approximately 240 commercial farmers and an unknown number of non-commercial farmers that GHCD can serve annually. GHCD estimates that it serves approximately 75 commercial farmers annually, but only a limited number of non-commercial farmers. The expectation of the Work Plan is that outreach to the former group will grow as VSP gets underway.

As described in Chapter 3, the Work Group will be responsible for setting annual outreach and participation targets for implementing the Work Plan. They will be monitoring progress in meeting these targets at their quarterly meetings. The selection of these outreach and participation targets need to reflect a variety of factors, such as current VSP funding levels, capacity of the Work Group and GHCD to implement them, and the potential for achieving benchmarks. The setting of future targets will be closely linked to monitoring; failure to meet critical area benchmarks will trigger adaptive management actions that may require increasing outreach efforts or trying alternative methods.

Table 3 on the following page outlines the VSP outreach and participation targets set for the 2017-2019 biennium. These targets reflect the effort necessary to establish a VSP program foundation, past GHCD outreach efforts, the number of farmers in the county, and current staffing capacity.

Table 3: Outreach & Participation Implementation Actions for the 2017-2019 Biennium

Action	Responsibility	Number	Notes
Recruit Pioneer Participants	Work Group & GHCD	2	Seek to recruit one participant with a focus on livestock and another with a focus on crops
Establish website	Work Group & GHCD	1	Website development will require contracted assistance with the goal of GHCD staff providing updates
Preparation & distribution of handouts	GHCD	Multiple	GHCD staff, potentially with contracted assistance, will produce and distribute a series of handouts about VSP and how operators can protect and enhance each of the critical areas Identify and establish locations for kiosks serving agricultural interests (e.g., feed stores & garden centers) to distribute information & handouts about VSP. Two should be in East County, one on the Harbor, and one on South Beach.
Direct marketing campaign	GHCD	1	Identify an agricultural sector or critical area priority and use parcel & KMZ data to do a direct mailing regarding available resources and benefits of an Individual Stewardship Plan
Individual Stewardship Plans	GHCD	10	Prepare Individual Stewardship Plans for commercial or noncommercial agricultural operators
On-going consultation	GHCD	10	Check in on those agricultural operators who adopted Individual Stewardship Plans on a quarterly basis
Organize a VSP Event	Work Group & GHCD	1	Organize and implement an individual event, or in coordination with a larger event, that features VSP in general or a specific aspect of the program (e.g., farm tour, county fair)
Site visits and other contact	GHCD	50	Reach out and conduct site visits to individual farmers to evaluate needs, share information about voluntarily protecting and enhancing critical areas, encourage the preparation of Individual Stewardship Plans, and verify completion of stewardship practices on critical areas.
Monitor outreach & participation activities quarterly	Work Group & LCD	Quarterly	The Work Group and LCD will monitor the progress of outreach and participation efforts during quarterly meetings. This will include tracking work completed to date, and if HRCD monitoring shows benchmarks in the watershed are not being met, adaptive management will need to adjust the outreach and participation biennial targets to reach them.

Chapter Five
Monitoring, Adaptive Management & Reporting Requirements

Work Plan Monitoring

VSP legislation requires the Work Group to monitor and show their progress towards achieving Work Plan goals and benchmarks. Monitoring is a process that entails collecting, tracking, and interpreting information about Work Plan implementation activities and results. This section describes a three-step approach for Work Plan monitoring.

Three-Step Work Plan Monitoring Process

Monitoring the Work Plan entails assessing the status of the July 22, 2011 Baseline; inventorying the type, extent, and effect of voluntary stewardship measures; and, evaluating progress in achieving the long-term viability of agriculture. The monitoring process will assess landscape changes on commercial and known small-scale, noncommercial agricultural lands.

Step 1. Monitoring the Status of Critical Areas on Agricultural Lands since July 2011

General Approach

The purpose of this monitoring step is to evaluate if Work Plan implementation is resulting in the degradation, maintenance, or enhancement to any one of the five critical areas as they existed as of July 22, 2011 on agricultural lands at a watershed scale.

Monitoring for changes to the July 2011 Baseline entails collecting, comparing, and analyzing data at future reference points to assess if there have been changes enough to affect critical areas and their function on agricultural lands. This process aids the Work Group in identifying and emphasizing the type and extent of voluntary conservation practices necessary for meeting critical area goals and benchmarks.

Monitoring Vegetation Change through Aerial Imagery

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

- Wetlands – loss or gain in acreage of wetland area or riparian vegetation

- Fish and wildlife habitat conservation areas – loss or gain in acreage of riparian forest cover, native vegetation, impervious surfaces
- Frequently flooded areas – gain or loss in acreage of impervious surfaces and riparian land cover
- Geologically hazardous areas - gain or loss in acreage of vegetative land cover

The data sources to be used are summarized in Table 4. Additional data sources may be used if determined by the Work Group and GHCD.

Table 4: Critical Area Baseline Monitoring Tools & Data Sources

Data	Data Source	Timeframe	Notes
Landsat Imagery	USGS	2011 & most recent	Landsat 4-5 for 2011, Landsat 8 subsequent. Downloaded from USGS Earth Explorer
National Agricultural Imagery Program (NAIP)	USDA	2011 & most recent	1-meter pixel imagery
County boundary	County		Currently available
County parcel data (Land use codes 82, 83, 85.96, 86.97)	County	Most recent	Commercial agricultural lands
Agricultural Survey	WSDA	2016 & most recent	Agricultural acreage may capture commercial & noncommercial agricultural lands not in ag land use codes or noncommercial inventory
Inventory of noncommercial agricultural properties	GHCD	Most recent	GHCD will keep an inventory list of noncommercial agricultural lands in the county as they become known
National Wetlands Inventory	USFWS	Most recent	Currently available
2011 Wetlands Inventory/Coastal Change Analysis Program	WDOE	2011 & most recent	Currently available
Flood Insurance Rate Maps	FEMA	Most recent	Currently available
Geologic Hazard Maps	WDNR	Most recent	Currently available
Priority Habitats & Species	WDFW	2011 & most recent	Currently available
303(d) List	ECY	2016 & most recent	Currently available

Superimposing aerial imagery from future reference points over this 2011 Baseline will detect if there have been landscape changes on known agricultural lands.[11]

The proposed method of vegetation monitoring combines multispectral remote sensing with simple visual verification. Lower-resolution (30m pixel) Landsat imagery is used to detect vegetation change over a set period, while more detailed NAIP imagery is used to verify and inventory the changes that are detected.

Images from the 2011 VSP baseline year will be compared to the most recent imagery available to assess changes. Table 5 below lists the steps to complete the analysis.

Table 5: Methodology for Aerial Imagery Monitoring

Step	Description
1	In conjunction with VSP Technical Panel, set minimum detection threshold and accuracy threshold for classification of positive and negative changes (including rates of omission and commission). For negative changes, these thresholds should meet the following accepted standards: ▪ Minimum size of changed detectable: 1/20th acre ▪ Error Rate (commission): <1% ▪ Error Rate (omission): <15% If the parties agree that the steps identified below will likely achieve these standards, the methods outline below will proceed.
2	Create appropriate folders to store imagery downloads, and processed imagery.
3	Access NAIP imagery (2011 and most recent).
4	Access Landsat imagery (2011 and most recent).
5	Create rasters for 2011 and the most recent imagery from the individual Landsat band rasters.
6	Mosaic composite rasters so that there is one composite raster covering the entire county for both 2011 and the most recent imagery.
7	Create a Normalized Difference Vegetation Index (NDVI) for the 2011 and the most recent imagery.[12]
8	Calculate a new "NDVI change" image showing the difference between the 2011 and the most recent NDVI rasters.
9	Normalize the NDVI change image based on known unchanged areas, i.e. rooftops. These areas should have a pixel value near zero.
10	Classify the NDVI change image so that significant positive and negative changes are displayed. Forestry clear-cuts (even if irrelevant to VSP) are a useful "significant change" benchmark to determine classification thresholds.
11	Fact-check the NDVI change image using areas of known vegetation change.
12	Conduct ground-truthing to verify that minimum thresholds are being met.
13	Clip the NDVI change image to relevant critical areas.
14	Create grid squares that overlay the vegetation changes that occurred on ag lands (parcel data, noncommercial inventory, WSDA layers) to allow for systematic visual analysis. Grid squares are NOT used to define specific areas for repeated analysis, they are simply an organizational tool to allow for systematic analysis.

Step	Description
15	Proceeding systematically through each overlayed grid square, use NAIP imagery from 2011 to most recent to confirm NDVI change pixels as positive, negative, or not-applicable. The criteria for a pixel to be not applicable should be defined beforehand. Record results in tabular form.
16	Conduct ground-truthing for at least 10% of the analysis areas showing positive or negative change. Ground-truthing should focus on areas that are near the threshold level for positive or negative change because these areas have a higher likelihood of being misclassified.
17	After ground-truthing, summarize positive and negative changes in tabular form by watershed. Report watershed scale results in terms of positive and negative change pixels (or area).

It is important to note that the use of imagery alone will not detect the loss or gain of critical area functions. However, GHCD will rely on literature citing accepted standards for drawing reasonable conclusions as to the impact landscape changes have on in enhancing or degrading critical area functions. GHCD staff will make this assessment by conducting additional imagery analysis or site inspection if access to the property is possible.

Table 6 summarizes by critical area the process how GHCD will use aerial imagery to further analyze landscape changes.

Table 6: Using Aerial Imagery to Analyze Landscape Changes & Their Effect on Critical Areas

Critical Area	Changes to look for through Imagery	Functions Potentially Affected
Wetlands	• Alterations to wetland (within limits of detected change) • Changes in wetland area • Increase or decrease in forest cover or native vegetation within wetland areas and their buffers	• Groundwater recharge/streamflow maintenance • Shoreline stabilization • Habitat • Sediment, nutrient, & chemical capture • Nutrient production export • Flood flow alteration
FWHCA	• Increase or decrease to forest cover or native vegetation within riparian areas • Upland activities that influence sediment and nutrient inputs to streams and wetlands	• Upland and in-stream habitat

Critical Area	Changes to look for through Imagery	Functions Potentially Affected
FFA	• Increase or decrease in impervious surfaces or structures area • Increase or decrease in forest cover or native vegetation within riparian area (or adjacent to stream) • Increase or decrease of agricultural land use within FFAs	• Decrease or expansion of the 100-year flood plain area • Decrease or increase in flood flow and water velocities • Decrease or increase in risk to people, property, & livestock
GHA	• Increase or decrease in forest cover or native vegetation within riparian zone area • Movement or alteration of river channel & streambank • Decrease in forest cover or native vegetation within riparian zones due to forestry, development, or stream migration. Other change factors may be reported by aerial imagery if requested. • Increase or decrease of forest cover or native vegetation on potential landslide areas • Increase or decrease of structures in earthquake risk areas	• Increase or decrease in channel migration & severe bank erosion • Increase or decrease in landslides • Increase or decrease in earthquake risks to people & property

Other Monitoring Indicators

The monitoring process will also incorporate other indicators show in the table below to assess impacts to critical areas.

Table 7: Other Monitoring Indicators for Assessing Impacts to Critical Area Functions

Critical Area	Monitoring Indicators	Data Source
FWHCA	303(d) lists to evaluate potential impacts to critical area functions within watershed	ECY Washington State Water Quality Assessment[13]
CARA	Well water testing reports within proximity to agricultural lands that show nitrate levels greater than 10 ppm and pesticides that exceed drinking water standards	WDOH Source Water Assessment Program[14] County Environmental Health Division Water Lab Ocean Spray Cooperative

Responsibilities for Step 1 Monitoring

Grays Harbor County GIS has committed to assisting GHCD in the aerial imagery monitoring process.

GHCD will prepare a report interpreting monitoring outcomes for the Work Group to track and assess progress in meeting critical area benchmarks.

If the Work Group, GHCD, and Grays Harbor County determines the in-house aerial imagery monitoring program is too difficult or time consuming, the monitoring process will contract with WDFW to use its High Resolution Change Detection program instead.

Baseline Monitoring Schedule

While the Work Group assumes commercial agricultural activities in the county have not made significant landscape changes to critical areas since July 2011, this assumption is untested. Furthermore, the Work Group has little knowledge about the overall impact that small-scale and noncommercial agriculture is having on critical areas.

The absence of this data recognizes the need to establish a monitoring program for the 2011 Baseline at a frequency greater than the Five-Year Status Report required under VSP legislation.[15] This frequency will allow for timely adaptive management discussed in the next section.

The Work Group plans to initiate the first monitoring of the 2011 Baseline in the Fall of 2018 using NAIP imagery from 2017. The Grays Harbor County GIS division within the Central Services Department will execute the GIS elements of the monitoring program. GHCD will be responsible for interpreting the results and preparing a summary report for the Work Group's review.

The Work Group should anticipate that this first monitoring sequence will trigger some level of adaptive management. Data will become available to assess the rate of change to critical areas on agriculture within each watershed for the years 2011 to 2017. If the rate of change is greater than expected, voluntary enhancement benchmarks for some critical areas the Work Group will need to increase to offset losses to critical area functions and values.

A second baseline monitoring will occur around December 2020 in preparation for the Five-Year Work Plan Status Report due in April 2021. With each monitoring event, the Work Group will gain precision in determining which critical areas and to what extent they need to encourage voluntary practices to stay on track with Work Plan goals.

Depending on the results of the first two monitoring cycles, the Work Group will evaluate whether there is a need to continue monitoring the baseline every two and one-half years.

The Work Group may decide in the future to incorporate other datasets from other public and nongovernmental agencies not presently available or known to determine the rate of change to critical areas.

Step 2. Monitoring Voluntary Protection & Enhancement of Critical Areas

The Work Group will monitor the implementation and discontinuance of stewardship practices that achieve critical area benchmarks. This entails tracking:

- The number of Individual Stewardship Plans (ISP) prepared and the number of agricultural operators consulted since July 22, 2011;
- The type, number, scope (i.e. acreage or feet), and effect of stewardship practices and activities implemented through ISPs and non-ISP efforts since July 22, 2011; and
- The type, number, scope, and effect of stewardship practices discontinued or reaching their lifespan since July 22, 2011.

GHCD will track the status of a stewardship practice through periodic site visits to the agricultural operation. Information collected will be entered into a spreadsheet for reporting at a watershed scale to the Work Group at their quarterly meetings and in required VSP reports.

Evaluating the Effect of Stewardship Practices

GHCD will measure the effect of an implemented stewardship practice by contrasting it with accepted practices, such as NRCS Conservation Practice or WDFW's Fish Passage Program guidelines. If it meets an accepted practice, the stewardship practice will receive a +2. If an implemented stewardship practice does not fully meet an accepted practice, it will still count but receive a lesser score of +1. Table 8 summarizes this approach.

Table 8: Scoring for Evaluating Stewardship Practices on Critical Areas

Effect of Stewardship Practice on Critical Areas	Score
Stewardship practices accepted practices that protect or enhance a critical area	+2
Stewardship practices that are less than an accepted practice, yet provides some level of protection or enhancement to a critical area	+1

Appendix C contains a list of voluntary stewardship practices implemented on agricultural lands between July 2011 and the end of 2017. GHCD will continue to expand this list with quarterly reporting to the Work Group. This will allow the Work Group to evaluate if implementation activities are meeting the projected number in benchmarks.

At two-year intervals, the Work Group will need to summarize and submit a report on its voluntary protection and enhancement efforts to the WSCC and the county. All information and counts in the report will be at a watershed scale. To protect confidentiality, counts will not identify individual participants.

Step 3. Monitoring Agricultural Viability

The monitoring process also will gauge progress in achieving the agricultural viability goals in the Work Plan. Monitoring indicators will include:

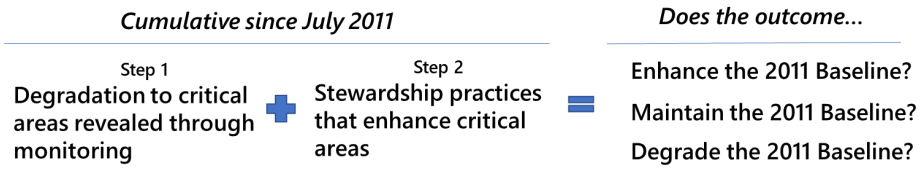
- Implementation of benchmark measures for each agricultural viability goals; and
- Changes in agricultural acreage.

GHCD shall provide this information in its quarterly report to the Work Group. The formal report provided at two-year intervals to the WSCC and the county at the end of each state fiscal year will also include a summary of this information.

Interpreting Monitoring Results

The most important step in the monitoring process is interpreting what it tells the Work Group about implementation progress in relation to meeting Work Plan critical area benchmarks.

This begins by gauging whether the cumulative benefits of stewardship practices at a watershed scale have off-set any cumulative negative impacts to a critical area benchmark. A comparison of monitoring results from Steps 1 and 2, as the figure below demonstrates, will tell the Work Group if they are meeting voluntary protection and enhancement benchmarks for critical area goals.



If Step 1 monitoring reveals degradation to a critical area through landscape changes since July 2011, the Work Group must consult the list of completed projects collated through Step 2 (Appendix C to evaluate and document if implemented stewardship practices completed elsewhere in the watershed compensated for any loss of function.

Depending upon this outcome, the Work Group needs to ask itself the following questions:

- Was the Work Plan successful in meeting the goals and benchmarks for the protection of critical areas on agricultural lands at a watershed scale?
  - If the answer is "yes," the Work Group continues to implement the goals in the Work Plan.
  - If the answer is "no," the Work Group will need to analyze why and initiate adaptive management.

- Was the Work Plan successful in meeting the goals and benchmarks for the voluntary enhancement of critical areas on agricultural lands at a watershed scale?
    - If the answer is "yes," the Work Group continues to implement critical area goals in the Work Plan.
    - If the answer is "no," the Work Group will need to analyze why and initiate adaptive management.

Interpreting benchmarks for ensuring the long-term agricultural viability involves a similar approach. It involves asking the question:

- Was the Work Plan successful in meeting the goals and benchmarks for ensuring agricultural viability and preventing the conversion of agricultural land to other uses?
    - If the answer is "yes," the Work Group continues to implement the agricultural viability goals of the Work Plan.
    - If the answer is "no," the Work Group will need to analyze why and may need to initiate adaptive management.

Using Caution When Interpreting Monitoring Results

There can be a great number of "uncertainties" when interpreting monitoring data. The Work Group must exercise caution to avoid certain "traps" as it goes through this process.

For one, enhancing the functions and values of a critical area in one area of a watershed in compensation for a loss in another is not an easy "apples-to-apples" exercise. Exact replication of a critical area in another location may not always render the same functions and values given the uniqueness of every site situation.

In some cases, it can take years before some level of parity occurs, such as clear-cutting a riparian corridor in one place and restoring one equal in size somewhere else. The opposite can be true as well; the enhancement value gained from a three-acre riparian restoration project meeting NRCS practices may significantly exceed the loss of a five-acre riparian corridor consisting of non-native vegetation. To fully quantify the exactness of these "equations" far exceeds budget, time, and skill. The lesson to learn here is that interpretation of monitoring data is not always an exact science and will often involve a certain amount of guesswork as to implementation outcomes.

Another factor to keep in mind is the wide variation of stewardship practices that can compensate for the loss of critical area functions. Focus should be on replacing critical area functions lost and not just replicating the degrading action in reverse. For instance, the response to one farmer allowing livestock to enter a stream is not always reliant on encouraging another farmer to keep theirs out. If the problem caused by

livestock access is over-sedimentation or excessive nutrients, other stewardship practices completed elsewhere by other agricultural operators can fully compensate for those impacts by implementing NRCS practices such as cover crops, nutrient management, filter strips, or channel bed stabilization. "Thinking outside of the box" will facilitate a more complete picture of protecting and enhancing the July 2011 Baseline.

Finally, it is important to keep in mind how off-site land uses or climate change can negatively affect critical area functions and values on agricultural lands. An increase in flood risk to agricultural lands may be the result of development actions elsewhere in the watershed. The degradation of fish and wildlife habitats on agricultural land that fail to support species, such as salmon, could be the result of forest practices upstream. Aquifer recharge areas are vulnerable to pollution and over withdrawals from residential and commercial growth. Drier summers can reduce the area of wetlands. These are but a few situations that can degrade critical area functions and values on agricultural lands.

The Work Group can overcome their discomfort with these uncertainties, however, by using reasonable assumptions and approximations when evaluating Work Plan progress in meeting goals and benchmarks. "Showing your work" is very important when drawing any conclusions from the monitoring data, especially when submitting Five-Year Status Reports.

Cooperative Monitoring with Other Entities

The Work Group will cooperate with state agencies and nongovernmental organizations in VSP monitoring efforts. This may include sharing data or exploring the addition of new monitoring methodologies into the Work Plan.

Factors to consider when exploring adding new monitoring methodologies into the Work Plan include its:

- Long-term funding and support;
- Ease of data interpretation;
- Scope and extent of the monitoring methodology within the watershed; and
- Ability to distinguish agriculture as a source of the impact to critical areas.

Work Plan Adaptive Management Process

Adaptive Management Concept

Adaptive management is a process that enables the Work Group to revise the Work Plan when monitoring activities reveal that the Work Plan is not meeting its critical area goals and benchmarks. This process can entail reassessing assumptions relied upon in

the Work Plan, adjusting action plans, and exploring new alternatives for outreach and participation.

Initiating Adaptive Management

The Work Group can initiate the adaptive management process as frequently as each quarterly meeting, as discussed in Chapter 3. For example, the Work Group may make small tweaks regarding how they manage outreach methods and strategies to encourage greater participation or prevent disenrollment of stewardship practices on specific critical areas.

On the other hand, a more demanding adaptive process becomes necessary if the monitoring process documents the degradation of a critical area below the July 22, 2011 baseline. Critical area monitoring using HRCD requires adaptive management when critical area landcover on agricultural lands results in a change of 120% or greater from the July 22, 2011 baseline. Other monitoring processes, such as an increase in 303(d) listings or degraded water quality in well reports will also require reassessment of the Work Plan through adaptive management.

Adaptive Management Considerations

There may be a variety of reasons why the Work Plan is not achieving its goals and benchmarks. These may include:

- Implemented stewardship practices did not fully compensate for losses to critical area functions and values;
- Outreach and participation activities are insufficiently implemented or inadequately designed to engage the agricultural community;
- Inadequate funding is available for implementing stewardship practices;
- Public perceptions of VSP create obstacles to participation;
- Poor economic conditions limit participation by agricultural producers;
- Monitoring methodologies are inadequate in their ability to filter out impacts caused by other surrounding land uses from agricultural activities, and/or
- Insufficient data has been collected to fully evaluate critical area degradation.

Pinpointing the root cause of the shortfall is an essential task for the Work Group to effectively choose the appropriate adaptive management response. This could result in small or major changes to benchmark monitoring and data collection methods as well as outreach and participation goals, methods, and action plans.

However, it is important to note that not all shortfalls are resolvable. For instance, poor economic conditions that dissuade agricultural operators from participating in VSP may prove insurmountable for the Work Group to overcome. In such cases, clear

documentation of the problem will be important when submitting required reporting to the county and WSCC.

VSP Reporting Requirements

Monitoring and adaptive management will aid the Work Group in meeting its two- and five-year reporting requirements to the WSCC and the county.

Two-Year Reporting Requirement

Within sixty days after the end of the state's two-year fiscal period, known as the "biennium," the Work Group must file a written report with WSCC and the county regarding its accomplishments during that time.[16] This report minimally will include:

- Aggregate information on the number stewardship practices implemented that address critical area benchmarks
- Progress in meeting agricultural viability benchmarks
- Changes to the 2011 critical area baseline, if known
- Adaptive management actions taken, if any
- Any other reporting requirements of the program

Submitting the two-year report to the WSCC and the county is an on-going responsibility of the Work Group that continues into the future.

Five-Year Reporting Requirement

Not later than five years from the date of receiving funding (March 21, 2021), the Work Group must report to the WSCC director and the county on whether it has met the work plan's voluntary protection and enhancement goals and benchmarks.[17]

The following reporting procedures apply to goals and benchmarks for protecting the 2011 critical area baseline:

- If the Work Group determines they have met the protection goals and benchmarks in the Work Plan, and the WSCC director concurs, the Work Group continues to implement the work plan.
    - If the director does not concur with the Work Group report, the director shall consult with the Statewide Advisory Committee for a recommendation as to how to proceed.
    - If the director, acting upon recommendation from the Statewide Advisory Committee, determines that the Work Group is likely to meet the goals

and benchmarks with an additional six months of planning and implementation time, the director must grant an extension.

- If the director, acting upon a recommendation from the statewide advisory committee, determines that the Work Group is unlikely to meet the goals and benchmarks within six months, the county becomes subject to RCW 36.70A.735.

- If the Work Group determines they have not met the protection goals and benchmarks, it must propose and submit to the WSCC director an adaptive management plan to achieve the goals and benchmarks. If the director does not approve the adaptive management plan under RCW 36.70A.730, the watershed is subject to RCW 36.70A.735.

The following reporting procedures apply to goals and benchmarks for voluntarily enhancing the 2011 critical area baseline:

- If the Work Group determines they have not met the voluntary enhancement goals and benchmarks, they must determine what additional voluntary actions are necessary to meet the benchmarks, identify the funding necessary to implement these actions, and implement these actions when funding is available.

As with the two-year reporting requirement, the Work Group must submit the five-year report every five years thereafter.[18]

Definitions

"Agricultural activities" means agricultural uses and practices including, but not limited to: Producing, breeding, or increasing agricultural products; rotating and changing agricultural crops; allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded; allowing land used for agricultural activities to lie dormant as a result of adverse agricultural market conditions; allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program, or the land is subject to a conservation easement; conducting agricultural operations; maintaining, repairing, and replacing agricultural equipment; maintaining, repairing, and replacing agricultural facilities, provided that the replacement facility is no closer to the shoreline than the original facility; and maintaining agricultural lands under production or cultivation

"Agricultural equipment" and "agricultural facilities" includes, but is not limited to:

- The following used in agricultural operations: Equipment; machinery; constructed shelters, buildings, and ponds; fences; upland finfish rearing facilities; water diversion, withdrawal, conveyance, and use equipment and facilities including, but not limited to, pumps, pipes, tapes, canals, ditches, and drains;
- Corridors and facilities for transporting personnel, livestock, and equipment to, from, and within agricultural lands;
- Farm residences and associated equipment, lands, and facilities; and
- Roadside stands and on-farm markets for marketing fruit or vegetables

"Agricultural land" means those specific land areas on which agricultural activities are conducted.

"Agricultural products" includes, but is not limited to, horticultural, viticultural, floricultural, vegetable, fruit, berry, grain, hops, hay, straw, turf, sod, seed, and apiary products; feed or forage for livestock; Christmas trees; hybrid cottonwood and similar hardwood trees grown as crops and harvested within twenty years of planting; and livestock including both the animals themselves and animal products including, but not limited to, meat, upland finfish, poultry and poultry products, and dairy products

"Critical areas" as defined under chapter 36.70A RCW includes the following areas and ecosystems:

- Wetlands;
- Areas with a critical recharging effect on aquifers used for potable waters;
- Fish and wildlife habitat conservation areas;
- Frequently flooded areas; and
- Geologically hazardous areas.

"Aquaculture" means the culture or farming of fish, shellfish, or other aquatic plants and animals. Aquaculture does not include the harvest of wild geoduck associated with the state managed wildstock geoduck fishery.

"Channel migration zone (CMZ)" means the area along a river within which the channel(s) can be reasonably predicted to migrate over time as a result of natural and normally occurring hydrological and related processes when considered with the characteristics of the river and its surroundings.

"Critical aquifer recharge areas" are areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.

"Enhance" or "enhancement" means to improve the processes, structure, and functions existing, as of July 22, 2011, of ecosystems and habitats associated with critical areas.

"Erosion hazard areas" are those areas containing soils which, according to the United States Department of Agriculture Natural Resources Conservation Service Soil Survey Program, may experience significant erosion. Erosion hazard areas also include coastal erosion-prone areas and channel migration zones.

"Fish and wildlife habitat conservation areas" are areas that serve a critical role in sustaining needed habitats and species for the functional integrity of the ecosystem, and which, if altered, may reduce the likelihood that the species will persist over the long term. These areas may include, but are not limited to, rare or vulnerable ecological systems, communities, and habitat or habitat elements including seasonal ranges, breeding habitat, winter range, and movement corridors; and areas with high relative population density or species richness. Counties and cities may also designate locally important habitats and species.

"Fish and wildlife habitat conservation areas" does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of, and are maintained by, a port district or an irrigation district or company.

"Frequently flooded areas" are lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater. These areas include, but are not limited to, streams, rivers, lakes, coastal areas, wetlands, and areas where high groundwater forms ponds on the ground surface.

"Geologically hazardous areas" are areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suited to siting commercial,

residential, or industrial development consistent with public health or safety concerns.

"Habitats of local importance" designated as fish and wildlife habitat conservation areas include those areas found to be locally important by counties and cities.

"Landslide hazard areas" are areas at risk of mass movement due to a combination of geologic, topographic, and hydrologic factors.

"Protect" or "protecting" means to prevent the degradation of functions and values existing as of July 22, 2011.

"Wetland" or "wetlands" means areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. However, wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate conversion of wetlands, if permitted by the county or city.

"Work plan" means a watershed work plan developed under the provisions of RCW 36.70A.720.

Appendix A:
Work Plan Development Process

Opting into the Voluntary Stewardship Program (VSP)

The Grays Harbor Board of County Commissioners adopted Resolution #2011-130, "A Resolution Electing to Participate in the Voluntary Stewardship Program," on December 19, 2011. The resolution designated "…all watersheds within the county as eligible for participation in the Voluntary Stewardship Program." The resolution further stated that the county would proceed once the Washington State Conservation Commission provides adequate funding for plan development.

Due to budget constraints, the Washington State Legislature delayed VSP funding for several years. The county and the Washington State Conservation Commission eventually executed a contract on April 15, 2016.[19]

Project Design & Work Group Formation

Grays Harbor County staff initiated the VSP planning process by contracting with a project facilitator/consultant to begin developing a conceptual project approach. After conducting key interviews with staff and agricultural representatives, the county released "A Strategy for Developing the VSP Work Plan" in June 2016. This discussion paper set four goals for developing a VSP planning process:

1. Develop a VSP Work Plan that the agricultural community enthusiastically will support through participation in stewardship efforts.

2. Establish voluntary stewardship efforts that effectively address impacts to critical areas on agricultural lands, especially those affecting fish and wildlife resources.

3. Build local leadership within the agricultural community that will sustain the VSP Work Plan into the future.

4. Foster partnerships that will contribute resources that will lead to the long-term success of the VSP Work Plan.

In August 2016, the Board of County Commissioners (BoCC) appointed an ad hoc VSP Steering Committee to begin organizing the planning process. Their purpose was to review the planning approach and begin recruiting efforts to fill Work Group positions. This committee met on September 9, 2016 with ten representatives from the agricultural community. They decided that the Work Group membership should include 10 representatives from the agricultural community, one from the Quinault Indian Nation, one from the Chehalis Reservation, two from the economic sector, and four from the environmental community. The agricultural representatives were to represent crops,

cattle, cranberry growers, truck farming, Christmas/poplar trees, aquaculture, and small-scale agricultural operators.

The ad hoc committee then requested the BoCC to send written invites to a diverse list of 49 people, both tribal governments, the Grays Harbor Conservation District (GHCD), agricultural organizations, and several state agencies. Twelve individuals accepted the invite to serve on the Work Group.

Member	Representing
Kyle Deerkop	Aquaculture, GHCD Board
Tony Enzler	Bank of the Pacific – agricultural lending
Dru Garson	Greater Grays Harbor (Chamber & Economic Development Council)
Darrell Haglund	Cranberry grower
Kirstin Harma	Chehalis Basin Lead Entity
Owen Shaffner	Crops, truck farming, GH Farm Bureau
Dan Wood	Dairy Federation
Mike Nordin	Manager, GHCD
Evan Sheffels	Washington Farm Bureau
Terry Willis	Crops, cattle, GH Farm Bureau
Gary Waltenburg	Cattle, GHCD Board
Geoff Willis	Crops

Several alternates were invited to participate as well.

Member	Representing
Brady Engvall	Aquaculture
Terry Moore	Cranberry grower
Jay Gordon	Dairy, Dairy Federation
Megan Martin / Jim Gretchman	GHCD staff

In addition, the Work Group invited the following agency personnel to participate as Advisory Board members:

Member	Representing
Wes Cormier	GH County BoCC
Jane Hewitt/Alice Shawyer/Will Hamlin	Grays Harbor County Planning Department
Bill Eller	Washington State Conservation Commission
Kelly McLain	Washington Department of Agriculture
Gloria Rogers	Washington Dept. of Fish & Wildlife / Noncommercial agriculture
Zachery Meyer/Heather Kosaka	Washington Department of Ecology

The BoCC and the Work Group were unsuccessful in getting responses from both Quinault and Chehalis regarding participation on the Work Group.[20] Additional outreach to environmental organizations similarly failed to attract interest.[21]

Work Plan Development

The Work Group held a series of workshops beginning in the Fall 2016 to develop a draft Work Plan. The table below provides the date and describes the focus of each workshop.

Date	Agenda
October 16, 2016	• Introduction to VSP • Overview of Work Plan development • Identifying positive work group attitudes
November 10, 2016	• Identifying Strengths, Weakness, Opportunities, & Threats to Grays Harbor agriculture workshop
January 12, 2017	• Setting goals for agricultural viability
February 09, 2017	• Grays Harbor agriculture
March 03, 2017	• Wetlands and agriculture
April 13, 2017	• Critical aquifer recharge areas • Conceptual Framework for implementing VSP in Grays Harbor
May 11, 2017	• Frequently flooded areas and agriculture • Geologically hazardous areas and agriculture • Fish & wildlife habitat conservation areas and agriculture
October 12, 2017	• Draft VSP Work Plan overview
November 09, 2017	• Draft VSP Work Plan overview

Date	Agenda
January 10, 2018	• Draft VSP Work Plan overview • Preparation for Preliminary Technical Panel Review
February 9,2018	• Technical Panel Preliminary Review
February 22, 2018	• Review of Preliminary Technical Panel comments • Work Plan implementation framework
March 08, 2018	• Work Plan implementation framework
April 12, 2018	• Work Plan implementation framework
May 10, 2018	• Deciding an Individual Stewardship Plan format
June 14, 2018	• Final edits • Work Group action to submit Work Plan to Technical Panel for review and comment
July 27, 2018	• First Formal Review before the Technical Panel
August 24, 2018	• Second Formal Review before the Technical Panel
September 13, 2018	• Work Group meeting to review recommended Technical Panel changes
September 17, 2018	• Third Formal Review before the Technical Panel; adoption of Work Plan

STATE OF WASHINGTON
CONSERVATION COMMISSION
PO Box 47721 • Olympia, Washington 98504-7721 • (360) 407-6200 • FAX (360) 407-6215

September 18, 2018

Jane W. Hewitt
Principal Planner
Grays Harbor County Planning & Building Division
100 W. Broadway, Suite 31
Montesano, WA 98563

Re: Approval of Grays Harbor County Voluntary Stewardship Program Work Plan

Dear Ms. Hewitt:

The Voluntary Stewardship Program (VSP) Technical Panel has reviewed the work plan submitted by the County and has approved the work plan at a formal review meeting on September 17, 2018.

As a result of the approval of the work plan by the Technical Panel, and in accordance with RCW 36.70A.725 (3) (a) (ii), the Director of the Conservation Commission must approve the work plan.

Therefore, by this letter, as Executive Director of the Washington State Conservation Commission, I formally approve the work plan for the County as of the date of this letter.

If any amendments have been made to the work plan during the Technical Panel review process, please provide the Conservation Commission an electronic link to the final version of the work plan. That link can be sent to Alicia McClendon at **amcclendon@scc.wa.gov**.

Thank you for your continued engagement in and support of VSP, and congratulations on the approval of the county's plan. If you have any questions, please feel free to contact me.

Sincerely,

Mark Clark
Executive Director

Appendix B:
Individual Stewardship Plan Template

The Grays Harbor Conservation District (GHCD) will use the template below for completing Individual Stewardship Plans for agricultural operators. Information collected through the template is transferable into a spreadsheet for reporting purposes.

Completion of this survey will help the agricultural community in Grays Harbor County meet its participation standards under the Voluntary Stewardship Program (VSP). This Individual Stewardship Plan survey will be used to assess trends in implementation of practices that support agricultural viability and critical area protection in Grays Harbor County. The individual results of this survey will be held in confidentiality by the Grays Harbor Conservation District. External reporting of Individual Stewardship Plan results will only occur at the watershed scale.

Answers marked with * are required.

Section 1. Introduction and Site Assessment

Your name*:	
Phone number or email address*:	
Today's date:	
Agricultural business address:	
Name of person who manages your farm:	
Number of acres in agricultural production*:	

What products do you produce?*

- ☐ Cranberries
- ☐ Dairy
- ☐ Shellfish
- ☐ Livestock
- ☐ Crop
- ☐ Other:

Please identify which of the following critical areas are on your property (multiple answers are okay)*:

- ☐ Wetland
- ☐ Grays Harbor
- ☐ Stream
- ☐ Endangered, threatened, or sensitive species (e.g. streaked horned lark, western snowy plover)
- ☐ Geologic hazards (e.g. steep slopes, landslide hazards, erosion hazards)

- ☐ Floodplain
- ☐ Aquifer recharge areas (i.e….)
- ☐ None – I do not have any critical areas on my property

For each question, please answer by placing an "X" the appropriate box.

	Yes	No	Unsure
Do you observe runoff from your property during regular rain events?			
Do you have a farm plan prepared in coordination with the Grays Harbor Conservation District?			
If yes, in what year was it prepared?			

Please list any other agricultural certification programs in which you participate:

Section 2. Agricultural Viability

The following questions are based on an assessment of risks to agricultural viability in Grays Harbor County. Your answers will be used to identify needs and opportunities for programs and/or outreach that can help support agricultural viability.

For each question, please answer by placing an "X" the appropriate box.

Regulatory Consistency	Yes	No	Unsure
Do you keep yourself informed of updates to relevant federal and state regulations and guidance?			

Comments on regulatory consistency:

Estate Planning	Yes	No	Unsure
Have you developed estate planning?			

Comments on estate planning:

Risk Management	Yes	No	Unsure
Do you carry crop insurance?			
Have you documented your assets to ensure that your will has adequate records in case of a need for emergency claims?			
Comments on risk management:			

Labor Supply	Yes	No	Unsure
Is adequate labor available to staff your production activities?			
Comments on labor supply and infrastructure:			

Pollinator Health	Yes	No	Unsure
Do you manage your lands to incorporate habitat for a diverse assemblage of pollinators?			
Have you or the land manager received training or advice in managing lands to improve habitat for native pollinators prior to/since 2011?			
Comments on pollinator health:			

Additional comments related to agricultural viability:

Section 3. Pesticides, Herbicides, and Fertilizers

This section relates to the following critical areas: streams, estuarine habitats, wetlands, and critical aquifer recharge areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Have you or the land manager received training, education, or advice in integrated pest management prior to/since 2011?					
Do you follow WSDA mandates (new RCWs and WACs) regarding application of pesticides?					
Do you implement integrated pest management and stewardship practices for pesticide application?					
Do you implement best practices for storage and disposal of pesticides, including abandoned storage depots?					

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you implement measures to limit pesticide, herbicide, or fertilizer transfer to drainage systems?					
Do you implement stewardship practices to manage agricultural runoff and leaching?					
Please provide additional comments related to your practices to limit the transport of pesticides, herbicides, and fertilizers to critical areas (optional):					

Section 4. Sediment Runoff

This section relates to the following critical areas: streams, estuarine habitats, and wetlands. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Have you improved your access road to limit erosion issues?					
Do you disperse concentrated flows from roof runoff or impervious surfaces like concrete pads away from high-use areas?					
Do you avoid or limit tilling during the wet season?					
Please provide additional comments related to your practices to limit sediment-laden runoff (optional):					

Section 5. Spill Prevention and Response

This section relates to the following critical areas: streams, estuarine habitats, wetlands, and critical aquifer recharge areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you employ spill prevention measures, such as secondary containment?					
Do you have emergency protocols and materials in place to respond to accidental spills?					
Do you implement measures to prevent contamination resulting from flooding events?					
Please provide additional comments related to your practices to prevent and respond to spills (optional):					

Section 6. Water Quantity

This section relates to the following critical areas: streams, wetlands, and critical aquifer recharge areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
If you irrigate, have you taken steps to improve irrigation efficiency (e.g. sprinkler systems, drip irrigation, etc.)?					
Do you use water catchment and retention strategies?					
Please provide additional comments related to your practices to conserve water (optional):					

Section 7. Floodplain

This section relates to the following critical areas: streams, wetlands, critical aquifer recharge areas, and frequently flooded areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
If your property is within the floodplain, are your operations compatible with seasonal or occasional winter flooding?					
Please provide additional comments related to your practices to maintain floodplain functions (optional):					

Section 8. Stream and Riparian Habitat

This section relates to the following critical areas: streams and wetlands. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you maintain vegetated riparian areas that separate your agricultural activities from adjacent streams or wetlands?					
Please provide additional comments related to your practices to maintain stream and riparian habitat (optional):					

Section 9. Wetlands

This section relates to the following critical areas: wetlands. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you conduct measures to protect or improve the water quality or habitat condition of existing wetlands?					
Please provide additional comments related to your practices to protect or improve wetland areas (optional):					

Section 10. Listed Species

This section relates to the following critical areas: fish and wildlife habitat conservation areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you conduct measures to maintain or improve habitat for threatened, endangered, or sensitive species that occur on your property? If yes, please describe these measures in the comments below.					
Please provide additional comments related to your practices to maintain or improve habitat for threatened, endangered, or sensitive species (optional).					

Section 11. Voluntary Restoration Projects

This section relates to the following critical areas: streams, estuarine habitats, wetlands, and critical aquifer recharge areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Have you conducted projects to restore or enhance floodplain or surge wetland functions?					
Have you repaired or replaced any culverts or tidegates to improve fish passage prior to/since 2011?					
Have you conducted any stream habitat restoration projects on your property?					
Have you conducted any estuarine enhancement or restoration projects prior to/since 2011?					
Please provide additional comments related to any voluntary restoration projects (optional):					

Section 12. Physical Safety – Flooding and Geohazards

This section relates to the following critical areas: frequently flooded areas and geologically hazardous areas. The following questions may apply to a range of producers and operations.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you ensure compliance with the County's Flood Damage Prevention Ordinance?					
Have you relocated any structures out of the mapped floodway?					

	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you regularly inspect and maintain any dikes or tidegates on your property?					
Do you implement stewardship practices to control drainage near geologically sensitive areas?					
Please provide additional comments related to your practices to maintain safety in areas prone to flooding and geohazards (optional):					

Section 13. Additional Questions for Cranberry Farmers

Questions specific to cranberry production relate to water quality control measures. This section relates to the following critical areas: streams, estuarine habitats, wetlands, and critical aquifer recharge areas.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

Pesticides, Herbicides, and Fertilizers	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you perform annual chemigation system checks?					
Do you implement stewardship practices to reduce nutrient, pathogen, and/or pesticide transfer to drainage?					
Do you implement fertilization plans to minimize the use of nutrients?					
Do you participate in Global Gap?					
If yes, what year did you enroll?					

Section 14. Additional Questions for Livestock and Dairy Farmers

Questions specific to livestock/dairy production relate to water quality control measures, including fecal coliform and nutrients and riparian management. This section relates to the following critical areas: streams, estuarine habitats, wetlands, and critical aquifer recharge areas.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

Fecal Coliform and Nutrients	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you implement stewardship practices to avoid water pollution from animal waste?					
Have you or the land manager received training in stocking rates and/or rotational grazing prior to/since 2011?					
Do you implement rotational grazing practices or other measures to prevent overstocking?					
Are your livestock concentration areas positioned away from surface waters?					
Please provide additional comments related to your practices that limit the transport of fecal coliform and nutrients to critical areas (optional):					

Riparian Management	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you provide off-stream watering access for livestock?					
Do you maintain barriers (vegetation, fencing, berms) to discourage livestock from entering streams?					
Have you improved stream crossing conditions to minimize instream disturbance?					
Please provide additional comments related to your practices that manage riparian areas (optional):					

Section 15. Additional Questions for Shellfish Farmers

Questions specific to shellfish production relate to water quality control measures, limiting the effects of practices on adjacent habitats, and ensuring that practices do not contribute to marine debris. This section relates to the following critical areas: estuarine habitats.

For each question, please answer by placing an "X" the appropriate box. If questions do not apply to your practices or conditions, please place an "X" in the "Not Applicable" box.

NPDES Consistency	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you ensure compliance with NPDES permit requirements for WSDA-approved pesticide application on marine lands?					
If you have an NPDES permit for shellfish hatchery or processing activities, do you comply with NPDES permit requirements?					
Please provide additional comments related to NPDES consistency (optional):					

Harvest Practices	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
If you practice mechanical shellfish harvesting, do you implement stewardship practices to minimize disturbance to adjacent habitats?					
If you practice off-bottom operations, do you position your gear to minimize effects to silt accretion and hydrodynamics?					
Please provide additional comments related to your practices to limit disturbance to adjacent habitats from harvest (optional):					

Marine Debris	I have maintained practices since 2011	I have improved practices since 2011	Not as much as in 2011	Unsure	Not Applicable
Do you remove all gear from tidelands when not in use?					
Do you engage in practices to keep longline rope from becoming debris?					
Please provide additional comments related to your practices to manage debris (optional):					

Section 16. Follow-up

In the following section, please indicate any areas where you would be interested in implementing new or additional conservation measures if funding and/or technical assistance are available.

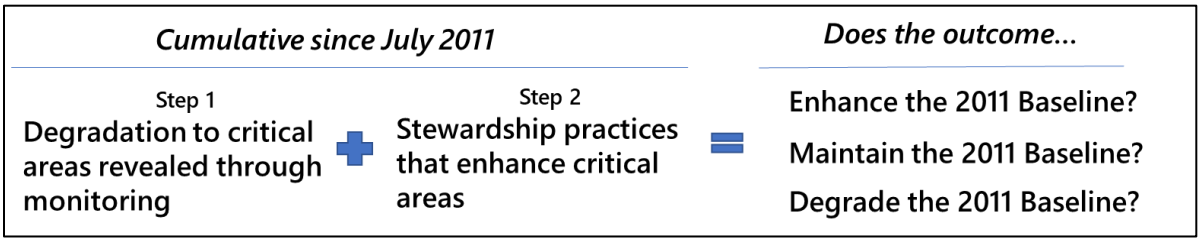
For each type of new practice, please indicate interest by placing an "X" the appropriate box. If practices do not apply to your operation, please place an "X" in the "Not Applicable" box.

	Yes, if funding is available	Yes, if technical assistance is available	Yes, on my own	No	Not Applicable
Estate planning and risk management					
Pollinator habitat					
Managing nutrients and runoff					
Managing application of pesticides, herbicides, and fertilizer					
Livestock management					
Irrigation efficiencies and water catchment strategies					
Improving floodplain, wetland, instream, or riparian habitat					
Improving habitat for threatened, endangered, or sensitive species					
Managing flood risks					
Please indicate any other activities that you are interested in, which are not listed above:					
Please provide any additional comments on this section:					

Appendix C:
Stewardship Practices Since July 2011

Since July 22, 2011, natural resource agencies have been implementing stewardship practices benefiting critical areas on agricultural lands throughout Grays Harbor County. Appendix C provides an inventory of these stewardship practices implemented between July 22, 2011 and December 31, 2017. The Work Group will be making updates to this inventory on a quarterly basis beginning in 2018.

Appendix C is an essential element to the monitoring program described in Chapter Five of the Work Plan.



If monitoring steps reveal degradation to a critical area since July 2011, the Work Group must consult the list of projects completed since that date to evaluate and document if there was adequate compensation through the implementation of voluntary stewardship practices.

If the cumulative benefits of stewardship practices do not off-set the cumulative negative impacts of landscape changes to a critical area as it existed as of July 2011, the Work Group will need to adjust the Work Plan (adaptive management) to ensure that it meets its protection goals. This evaluation process occurs for each of the county's watersheds.

The Work Group needs to aggressively monitor this relationship as frequently as possible to ensure that Work Plan outcomes are maintaining or enhancing the 2011 Baseline. The Five-Year Work Plan Status Report requires this information.

Natural Resource Conservation Service

The Natural Resource Conservation Service (NRCS) implements a wide range of projects in Grays Harbor County through both the Montesano and Chehalis Service Centers.

The Table 1 below includes NRCS projects completed between July 2011 and December 31, 2017 assumed to provide a direct or indirect beneficial impact to the five critical areas based on their description in the Field Office Technical Guide (FTOG). Table 2 that follows shows the critical area each practice benefits, including its

calculated project lifespan[22]. Because these projects satisfied NRCS FTOG specifications, they receive a Stewardship Rating of +2 for their benefit to critical areas.

Table 1. NRCS Projects Completed; July 2011 through 2017[23]

Code	Practice	Contracts	Number	Unit
472	Access Control	7	23	Acres
560	Access Road	17	39,496	Feet
396	Aquatic Organism (Fish) Passage	11	45	Miles
314	Brush Management	14	158	Acres
584	Channel Stabilization	1	50	Feet
326	Clearing and Snagging	1	180	Feet
327	Conservation Cover	4	13	Acres
340	Cover Crop	4	75	Acres
342	Critical Area Planting	23	49	Acres
775	Drainage Ditch Covering	8	4,239	Feet
554	Drainage Water Management	63	200	Acres
647	Early Successional Habitat Development/Management	7	77	Acres
382	Fence	1	1,500	Feet
512	Forage and Biomass Planting	5	91	Acres
666	Forest Stand Improvement	78	4,117	Acres
422	Hedgerow Planting	7	2,232	Feet
315	Herbaceous Weed Control	7	116	Acres
595	Integrated Pest Management	1	3	Acres
484	Mulching	23	32	Acres
590	Nutrient Management	5	438	Acres
582	Open Channel	6	550	Feet
643	Restoration & Management of Rare & Declining Habitats	54	523	Acres
391	Riparian Forest Buffer	9	48	Acres
654	Road/Trail/Landing Closure & Treatment	4	8,025	Feet
798	Seasonal High Tunnel System for Crops	2	4,678	$Feet^2$
395	Stream Habitat Improvement & Mgt.	5	71	Acres
649	Structures for Wildlife	10	86	Count
612	Tree/Shrub Establishment	53	718	Acres
645	Upland Wildlife Habitat Management	16	1,796	Acres
657	Wetland Restoration	2	31	Acres
644	Wetland Wildlife Habitat Management	2	8	Acres
384	Woody Residue Treatment	1	5	Acres

NRCS funding for these practices were through the Environmental Quality Incentives Program (EQIP).

Table 2. NRCS Practices Implemented; 2011 – 2017: Practice Lifespan & Benefits to Critical Areas

Code	Practice	Practice Lifespan	WET	CARA	FWHCA	FFA	GHA
560	Access Road	10			•		
396	Aquatic Organism (Fish) Passage	5	•		•		
314	Brush Management	10			•		•
584	Channel Stabilization	10			•	•	•
326	Clearing and Snagging	5				•	
327	Conservation Cover	5	•		•		•
340	Cover Crop	1	•		•		•
342	Critical Area Planting	10	•		•	•	•
775	Drainage Ditch Covering	10	•	•	•		
554	Drainage Water Management	1	•	•	•		
647	Early Successional Habitat Development/ Management	1	•		•		
382	Fence	20	•		•		•
512	Forage and Biomass Planting	5	•		•		
666	Forest Stand Improvement	10			•		
422	Hedgerow Planting	15	•		•		
315	Herbaceous Weed Control	5	•		•		•
595	Integrated Pest Management	1	•	•	•		
484	Mulching	1			•		•
590	Nutrient Management	1		•	•		
582	Open Channel	15			•	•	•
643	Restoration and Management of Rare and Declining Habitats	1	•		•		
391	Riparian Forest Buffer	15	•		•	•	•
654	Road/Trail/Landing Closure and Treatment	10	•		•		•
798	Seasonal High Tunnel System for Crops	4		•			
395	Stream Habitat Improvement and Management	5	•		•		•
649	Structures for Wildlife	5	•		•		
612	Tree/Shrub Establishment	15	•	•	•		•
645	Upland Wildlife Habitat Management	1	•		•		
657	Wetland Restoration	15	•		•		
644	Wetland Wildlife Habitat Management	1	•		•		
384	Woody Residue Treatment	10			•		

Grays Harbor Conservation District

Grays Harbor Conservation District (GHCD) implements agricultural and forestry stewardship programs in Grays Harbor County. GHCD also has been an active project sponsor under the Salmon Recovery Grant program.

Table 3 inventories projects completed on agricultural lands July 2011 through 2017 and Table 4 shows the critical area each practice benefits. The Washington State Conservation Commission provided funding for these projects. Because these projects satisfied NRCS FTOG specifications, they all receive a Stewardship Rating of +2 for their benefit to critical areas.

Table 3. GHCD projects completed, July 2011 through 2017

Code	Project	Landowners	Number	Unit
595	Integrated Pest Management (replacement of cranberry chemigation units)	10	16	Number
595	Integrated Pest Management (cribbing and covering of cranberry ditches)	1	144	Feet
590	Nutrient Management (manure management equipment)	4	4	Number
443	Irrigation System, Surface & Subsurface	1	1,500	Feet
	Farm Equipment Pads	2	2	Number
382	Fence	4	14,957	Feet
391	Riparian Forest Buffer	17	147	Acres

Table 4. GHCD projects completed, July 2011 through 2017

Code	Project	WET	CARA	FWHCA	FFA	GHA
595	Integrated Pest Management (replacement of cranberry chemigation units)	•	•	•		
595	Integrated Pest Management (cribbing and covering of cranberry ditches)	•	•	•		
590	Nutrient Management (manure management equipment)		•	•		
443	Irrigation System, Surface & Subsurface	•	•	•		
	Farm Equipment Pads				•	
382	Fence	•		•		•
391	Riparian Forest Buffer	•		•	•	•

Lewis Conservation District

The Lewis Conservation District (LCD) based out of neighboring Lewis County has been assisting agricultural operators in Grays Harbor County prepare irrigation management plans. Beginning in 2011 through December 2017, LCD has assisted in preparing four irrigation plans covering 315 acres. In 2018, LCD will be installing fish screens on irrigation intakes. These plans will provide significant benefit to fish and wildlife habitat conservation areas by increasing water quantity in streams during summer months as well as reducing juvenile salmon mortality from unscreened intakes.

Funding for this project came from US Fish and Wildlife Service, the Department of Ecology, and the Rose Foundation. The grant expires September 2018.

Stewardship Practices by Individual Agricultural Operators

Once the outreach program begins, the Technical Provider will be collecting information from individual agricultural operators regarding self-installed stewardship practices since July 2011. Along with the type and extent of the practice, the Technical Provider will also evaluate its impact to a critical area and assign an appropriate score.

This information will be added to the list of completed projects since July 2011.

Description of Implemented Stewardship Practices

The following descriptions for each practice are from the Field Office Technical Guide for Grays Harbor County (2017).

560 Access Road

An access road is used to provide a fixed route for vehicular travel for resource activities involving the management of timber, livestock, agriculture, wildlife habitat, and other conservation enterprises.

396 Aquatic Organism Passage

Improve or provide passage for aquatic organisms.

314 Brush Management

Create the desired plant community consistent with the ecological site or a desired state within the site description. • Restore or release desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality, or enhance hydrology. • Maintain, modify, or enhance fish and wildlife habitat. • Improve forage accessibility, quality, and quantity for livestock and wildlife. • Manage fuel loads to achieve desired conditions. • Pervasive plant species are controlled to a desired level of treatment that will ultimately contribute to creation or maintenance of an ecological site description "steady state" addressing the need for forage, wildlife habitat, and/or water quality.

584 Channel Stabilization

This practice may support one or more of the following: • Maintain or alter channel bed elevation or gradient. • Modify sediment transport or deposition. • Manage surface water and groundwater levels in floodplains, riparian areas, and wetlands

326 Clearing and Snagging

Reduce risks to agricultural resources or civil infrastructure by removing obstructions that hinder channel flow or sediment transport to: • Restore flow capacity and direction. • Prevent excessive bank erosion by eddies or redirection of flow.

• Reduce the undesirable formation of bars. • Minimize blockages by debris and ice.

327 Conservation Cover

This practice is applied to support one or more of the following purposes: • Reduce sheet, rill, and wind erosion and sedimentation. • Reduce ground and surface water quality degradation by nutrients and surface water quality degradation by sediment. • Reduce emissions of particulate matter (PM), PM precursors, and greenhouse gases.) • Enhance wildlife, pollinator and beneficial organism habitat. • Improve soil health.

340 Cover Crop

This practice is applied to support one or more of the following purposes: • Reduce erosion from wind and water. • Maintain or increase soil health and organic matter content. • Reduce water quality degradation by utilizing excessive soil nutrients. • Suppress excessive weed pressures and break pest cycles. • Improve soil moisture use efficiency. • Minimize soil compaction

342 Critical Area Planting

• Stabilize areas with existing or expected high rates of soil erosion by wind or water. • Stabilize stream and channel banks, pond and other shorelines, earthen features of structural conservation practices. • Stabilize areas such as sand dunes and riparian area

775 Drainage Ditch Covering

This practice is applied as part of a water management system to achieve one or more of the following purposes: • Reduce nutrient, pathogen, and/or pesticide transfer to drainage systems and subsequently to downstream receiving waters. • Block the direct entry of pesticides applied thru sprinkler irrigation into drainage ditch water. • Prevent the direct entry of liquid manure into drainage ditches during application by sprinkler systems.

554 Drainage Water Management

The purpose of this practice is to: • Reduce nutrient, pathogen, and pesticide loading from drainage systems into downstream receiving waters. • Improve productivity, health, and vigor of plants. • Reduce oxidation of organic matter in soils.

647 Early Successional Habitat Development/Management

To provide habitat for species requiring early successional habitat for all or part of their life cycle.

382 Fence

This practice facilitates the accomplishment of conservation objectives by providing a means to control movement of animals and people, including vehicles.

734 Fish and Wildlife Structure

To facilitate and/or improve overall conditions for fish or wildlife species.

512 Forage and Biomass Planting

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pasture.

666 Forest Stand Improvement

• Improve and sustain forest health and productivity • Reduce damage from pests and moisture stress • Initiate forest stand regeneration • Reduce fire risk and hazard and facilitate prescribed burning • Restore or maintain natural plant communities • Improve wildlife and pollinator habitat • Alter quantity, quality, and timing of water yield • Increase or maintain carbon storage

422 Hedgerow Planting

Providing at least one of the following conservation functions: • Habitat, including food, cover, and corridors for terrestrial wildlife. • To enhance pollen, nectar, and nesting habitat for pollinators. • Food, cover, and shade for aquatic organisms that live in adjacent streams or watercourses. • To provide substrate for predaceous and beneficial invertebrates as a component of integrated pest management. • To intercept airborne particulate matter. • To reduce chemical drift and odor movement. • Screens and barriers to noise and dust. • To increase carbon storage in biomass and soils. • Living fences • Boundary delineation and contour guidelines

315 Herbaceous Weed Control

• Enhance accessibility, quantity, and/or quality of forage and/or browse. • Restore or release native or create desired plant communities and wildlife habitats consistent with the site potential. • Protect soils and control erosion. • Reduce fine fuel loads and wildfire hazard. • Pervasive plant species are controlled to a desired level of treatment that will ultimately contribute to creation or maintenance of an ecological site description "steady state," addressing the need for forage, wildlife habitat, and/or water quality. • Improve rangeland health

595 Integrated Pest Management

• Prevent or mitigate off-site pesticide risks to water quality from leaching, solution runoff and adsorbed runoff losses. • Prevent or mitigate off-site pesticide risks to soil,

water, air, plants, animals and humans from drift and volatilization losses. • Prevent or mitigate on-site pesticide risks to pollinators and other beneficial species through direct contact. • Prevent or mitigate cultural, mechanical and biological pest suppression risks to soil, water, air, plants, animals and humans.

484 Mulching

This practice is applied to achieve the following purpose(s): • Improve the efficiency of moisture management • Reduce irrigation energy used in farming/ranching practices and field operations • Improve the efficient use of irrigation water • Prevent excessive bank erosion from water conveyance channels • Reduce concentrated flow erosion • Reduce sheet, rill, & wind erosion • Improve plant productivity and health • Maintain or increase organic matter content • Reduce emissions of particulate matter

590 Nutrient Management

To budget, supply, and conserve nutrients for plant production. • To minimize agricultural nonpoint source pollution of surface and groundwater resources. • To properly utilize manure or organic by-products as a plant nutrient source. • To protect air quality by reducing odors, nitrogen emissions (ammonia, oxides of nitrogen), and the formation of atmospheric particulates. • To maintain or improve the physical, chemical, and biological condition of soil

582 Open Channel

Construct, improve, or restore an open channel to convey water required for flood prevention, drainage, wildlife habitat protection or enhancement, or other authorized water management purpose

643 Restoration and Management of Rare and Declining Habitats

To restore the physical conditions and/or unique plant community on sites that partially support, or once supported, a rare or declining natural community. Application of this practice addresses resource concerns of a degraded plant condition and/or inadequate wildlife habitat

391 Riparian Forest Buffer

Create shade to lower or maintain water temperatures to improve habitat for aquatic organisms. • Create or improve riparian habitat and provide a source of detritus and large woody debris. • Reduce excess amounts of sediment, organic material, nutrients and pesticides in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow. • Reduce pesticide drift entering the water body. • Restore riparian plant communities. • Increase carbon storage in plant biomass and soils

654 Road/Trail/Landing Closure and Treatment

To minimize various resource concerns associated with existing roads, trails, and/or landings by closing them and treating to a level where one or more the following objectives are achieved: • Controlling erosion (road, sheet and rill, gully, wind), chemical residues and off-site movement, sediment deposition and damage, accentuated storm runoff, and particulate matter generation. • Restoring land to a productive state by reestablishing adapted plants and habitat (wildlife food, cover, and shelter), reconnecting wildlife habitat and migration corridors including streams and riparian areas and controlling noxious and invasive species. • Reestablishing drainage patterns that existed prior to construction of the road, trail, or landing to restore the form and integrity of associated hill slopes, channels and floodplains and their related hydrologic and geomorphic processes. • Minimizing human impacts to the closure area to meet safety, aesthetic, sensitive area protection, or wildlife habitat requirements

798 Seasonal High Tunnel System for Crops

Improve plant quality • Improve soil quality • Reduced nutrient and pesticide transport • Improve air quality through reduced transportation inputs • Reduce energy use through local consumption

395 Stream Habitat Improvement and Management

• Provide suitable habitat for desired fish and other aquatic species. • Provide stream channel and associated riparian conditions that maintain stream corridor ecological processes and hydrological connections of diverse stream habitat types important to aquatic species.

649 Structures for Wildlife

To provide structures, in proper amounts, locations and seasons to: • Enhance or sustain non-domesticated wildlife; or • Modify existing structures that pose a hazard to wildlife

612 Tree/Shrub Establishment

Establish woody plants to: • Maintain or improve desirable plant diversity, productivity, and health by establishing woody plants. • Create or improve habitat for desired wildlife species compatible with ecological characteristics of the site. • Control erosion. • Improve water quality. • Reduce excess nutrients and other pollutants in runoff and groundwater. • Sequester and store carbon. • Restore or maintain native plant communities. • Develop renewable energy systems. • Conserve energy. • Provide for beneficial organisms and pollinators

490 Tree/Shrub Site Preparation

- Encourage natural regeneration of desirable woody plants. • Permit artificial establishment of woody plants

645 Upland Wildlife Habitat Management

Treating upland wildlife habitat concerns identified during the conservation planning process that enable movement, or provide shelter, cover, food in proper amounts, locations and times to sustain wild animals that inhabit uplands during a portion of their life cycle

657 Wetland Restoration

To restore wetland function, value, habitat, diversity, and capacity to a close approximation of the pre-disturbance conditions by restoring: • Conditions conducive to hydric soil maintenance. • Wetland hydrology (dominant water source, hydroperiod, and hydrodynamics). • Native hydrophytic vegetation (including the removal of undesired species, and/or seeding or planting of desired species). • Original fish and wildlife habitats

644 Wetland Wildlife Habitat Management

To maintain, develop, or improve wetland habitat for waterfowl, shorebirds, fur-bearers, or other wetland dependent or associated flora and fauna

384 Woody Residue Treatment

- Reduce hazardous fuels. • Reduce the risk of harmful insects and disease.
- Protect/maintain air quality by reducing the risk of wildfire. • To improve access for management purposes. • Improve access to forage for livestock and wildlife.
- Develop renewable energy systems. • Enhance aesthetics. • Reduce the risk of harm to humans and livestock. • Improve the soil organic matter. • Improve the site for natural or artificial regeneration

Appendix D:
Voluntary Stewardship Program Resources

Introduction

The Work Group and the Grays Harbor Conservation District (GHCD) will need to leverage resources from a wide range of federal, state, local, and non-profit agencies and organizations to provide the financial incentives necessary for some agricultural producers to implement the stewardship practices identified in the Work Plan. While GHCD is the designated technical provider for the Work Group, other entities also play a role as technical providers who can provide both financial and technical assistance to producers. The stewardship practices and activities implemented through these other technical providers count towards meeting Work Plan goals, whether the Work Group or GHCD are directly, indirectly, or not involved.

The realm of resources available to VSP in Grays Harbor County is quite large. Success in leveraging resources for VSP will depend on finding out where the resources are, building partnerships with the technical providers, and linking them into Work Plan implementation.

This appendix seeks to list many of the most commonly used resources as well as some lesser known ones. It also includes some suggested approaches for considering non-traditional resources that may prove useful.

Please note that programs change frequently both in scope and available funding; it is important for the Work Group and GHCD to stay current on this topic. For those reading the e-version of this appendix, each Program has a link to a website that is current as of April 2018.

Resources Addressing Critical Area Goals

Farm Service Agency

The United States Department of Agriculture Farm Service Agency (FSA) oversees a number of voluntary conservation-related programs. These programs work to address many farming and ranching related conservation issues.

Program	Overview
Conservation Reserve Program	The Conservation Reserve Program (CRP) pays a yearly rental payment in exchange for farmers removing environmentally sensitive land from agricultural production and planting species that will improve environmental quality.

Program	Overview
Conservation Reserve Enhancement Program	The Conservation Reserve Enhancement Program (CREP) is a joint federal and Washington State funded program that restores streamside habitat for salmon and protects that habitat for 10-15 years. CREP plants native trees and shrubs to improve stream conditions and enhance wetlands along salmon streams. All of the costs for these improvements are paid by the program. In addition, the program provides oversight and maintenance for about five years after planting to assure success. The landowners are paid rent for allowing their land to be used for fish and wildlife improvements and receive a monetary bonus for signing up. Interested landowners should contact their local conservation district.
Emergency Conservation Program	The Emergency Conservation Program (ECP) helps farmers and ranchers to repair damage to farmlands caused by natural disasters and to help put in place methods for water conservation during severe drought. The ECP does this by giving ranchers and farmers funding and assistance to repair the damaged farmland or to install methods for water conservation. Up to 75% of the cost to implement emergency conservation practices can be provided, however the final amount is determined by the committee reviewing the application. Qualified limited resource producers may earn up to 90% cost-share.
Farmable Wetlands Program	The Farmable Wetlands Program (FWP) is designed to restore wetlands and wetland buffer zones that are farmed. FWP gives farmers and ranchers annual rental payments in return for restoring wetlands and establishing plant cover.

Natural Resources Conservation Service (NRCS) Washington

NRCS Washington offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance to help manage natural resources in a sustainable manner. Through these programs the agency approves contracts to provide financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land.

Program	Overview
Conservation Stewardship Program (CSP)	The Conservation Stewardship Program (CSP) helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resources concerns. Participants earn CSP payments for conservation performance—the higher the performance, the higher the payment. Focus areas include degraded plant conditions, fish and wildlife habitat, inefficient energy use, soil quality degradation, & water quality degradation.

Program	Overview
Environmental Quality Incentives Program (EQIP)	EQIP provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat. Eligible program participants receive financial and technical assistance to implement conservation practices, or activities like conservation planning, that address natural resource concerns on their land. Payments are made to participants after conservation practices and activities identified in an EQIP plan of operations are implemented. Contracts can last up to ten years in duration. Also see High Tunnel System Initiative.
Agricultural Conservation Easement Program (ACEP) - Wetland Reserve Easements (ACEP-WRE)	NRCS also provides technical and financial assistance directly to private landowners and Indian tribes to restore, protect, and enhance wetlands through the purchase of a wetland reserve easement. Through the Wetland Reserve Easement enrollment options, NRCS may enroll eligible land through: Permanent Easements – Permanent Easements are conservation easements in perpetuity. NRCS pays 100 percent of the easement value for the purchase of the easement. Additionally, NRCS pays between 75 to 100 percent of the restoration costs. 30-year Easements – 30-year easements expire after 30 years. Under 30-year easements, NRCS pays 50 to 75 percent of the easement value for the purchase of the easement. Additionally, NRCS pays between 50 to 75 percent of the restoration costs. 30-year Contracts – 30-year contracts are only available to enroll acreage owned by Indian tribes, and program payment rates are commensurate with 30-year easements. For wetland reserve easements, NRCS pays all costs associated with recording the easement in the local land records office, including recording fees, charges for abstracts, survey and appraisal fees, and title insurance.
Conservation Innovation Grants	The Conservation Innovation Grant (CIG) is a voluntary, competitive grants program intended to stimulate the development and adoption of innovative approaches and technologies for conservation on agricultural lands. CIG uses Environmental Quality Incentives Program (EQIP) funds to award competitive grants to non-federal governmental or non-governmental organizations, American Indian Tribes or individuals. Producers involved in CIG funded projects must be EQIP eligible.

US Fish and Wildlife Service

The US Fish and Wildlife Service offers a technical and financial assistance program to individual landowners under the Partners for Fish & Wildlife Program that benefit critical areas.

Program	Overview
Partners for Fish & Wildlife Program	The Partners program provides expert technical assistance and cost-share incentives directly to private landowners to restore fish and wildlife habitats. To implement a project, a cooperative agreement with a minimum duration of 10 years is signed. The landowner is reimbursed after project completion, based on the cost-sharing formula in the agreement.

Washington State Resource & Conservation Office

Program	Overview
Salmon Recovery Grant Program	Salmon recovery grants are awarded by the Salmon Recovery Funding Board to protect and restore salmon habitat. The board funds projects that protect existing, high quality habitats for salmon, and that restore degraded habitat to increase overall habitat health and biological productivity. Applicants can be private landowners and must submit their proposals through the local Lead Entity, Chehalis Basin Lead Entity (WRIA 23), the Lower Columbia Fish Recovery Board (WRIA 26), or Nisqually River Salmon Recovery Lead Entity (WRIA 11).
Irrigation Efficiencies Grant Program	Washington's Irrigation Efficiencies Grant Program (IEGP) restores instream flows in rivers and streams determined to not have enough water for fish populations and other competing needs. The Washington State Conservation Commission (SCC) works with conservation districts to provide financial incentives – up to 85 percent of total project costs – to landowners willing to install irrigation systems that save water. The water saved helps increase the stream flow in tributaries where ESA (Endangered Species Act)-listed species will benefit. And, in most cases, the more efficient irrigation systems lead to increased crop production due to reduced water stress.

Washington State University Extension – Grays Harbor County

Program	Overview
Master Gardner Program	Master Gardeners train volunteers to be effective community educators in gardening and environmental stewardship. Master Gardeners provide information generated from research at WSU and other university systems. The program focuses on teaching community members about managing their gardens and landscapes in a science-based, sustainable manner; addressing environmental and social priorities such as water conservation and water quality protection; reducing the impact of invasive species; and, increasing public awareness of healthy living through gardening.
Small Farms Educator	Extension staff provide technical assistance in farm management and agricultural regulations for dairy and other agricultural production.

Grays Harbor County

Program	Overview
Open Space Taxation Act	The Open Space Taxation Act allows property owners to have their open space, farm and agricultural, and timber lands valued at their current use rather than at their highest and best use. The Act states that it is in the best interest of the state to maintain, preserve, conserve, and otherwise continue in existence adequate open space lands to produce food, fiber, and forest crops and to assure the use and enjoyment of natural resources and scenic beauty for the economic and social well-being of the state and its citizens.

Resources Addressing Agricultural Viability Goals

The US Department of Agriculture provides a variety of programs aimed at the agricultural viability goals identified in the Work Plan. Most of these programs require an organization or local government to sponsor the grant.

Program	Overview
Open Space Taxation Act	The Open Space Taxation Act allows property owners to have their open space, farm and agricultural, and timber lands valued at their current use rather than at their highest and best use. The Act states that it is in the best interest of the state to maintain, preserve, conserve, and otherwise continue in existence adequate open space lands to produce food, fiber, and forest crops and to assure the use and enjoyment of natural resources and scenic beauty for the economic and social well-being of the state and its citizens.

Program	Overview
Beginning Farmer & Rancher Development Program (USDA)	The Beginning Farmer and Rancher Development Program provides grants to organizations for education, mentoring, and technical assistance initiatives for beginning farmers or ranchers. Grants go to partnerships and collaborations led by or including nongovernmental, community-based organizations and school-based agricultural, educational organizations with expertise in new agricultural producer training and outreach.
Rural Business Development Grants (USDA Rural Development)	This program is a competitive grant designed to support targeted technical assistance, training and other activities leading to the development or expansion of small and emerging private businesses in rural areas which will employ 50 or fewer new employees and has less than $1 million in gross revenue. Grants available to communities, authorities, nonprofit organizations, institutions of higher education, and rural cooperatives.
Farmers Market Promotion Program (USDA Ag Marketing Service)	The purpose of the Farmers Market Promotion Program (FMPP) is to increase domestic consumption of, and access to, locally and regionally produced agricultural products, and to develop new market opportunities for farm and ranch operations serving local markets by developing, improving, expanding, and providing outreach, training, and technical assistance to, or assisting in the development, improvement, and expansion of, domestic farmers markets, roadside stands, community-supported agriculture programs, agritourism activities, and other direct producer-to-consumer market opportunities.
Value Added Producer Grants (USDA Rural Development)	The Value-Added Producer Grant (VAPG) program helps agricultural producers enter into value-added activities related to the processing and/or marketing of new products. The goals of this program are to generate new products, create and expand marketing opportunities, and increase producer income. Applicants may receive priority if they are a beginning farmer or rancher, a socially-disadvantaged farmer or rancher, a small or medium-sized farm or ranch structured as a family farm, a farmer or rancher cooperative, or are proposing a mid-tier value chain. Examples of planning activities include conducting feasibility studies and developing business plans for processing and marketing the proposed value-added product. Examples of working capital expenses include: Processing costs, Marketing and advertising expenses, Some inventory and salary expenses.
4-H Program (WSU Extension Grays Harbor County)	Youth program that provides hands-on projects in agriculture, science, health, and citizenship. Key programs include Science, Technology, Engineering, and Math (STEM) with a focus on agricultural science, veterinary science, raising and training animals, and forestry.

Program	Overview
Washington Farm Bureau	The Washington Farm Bureau is an independent, non-governmental, voluntary organization governed by and representing farm and ranch families united for the purpose of analyzing their problems and formulating action to achieve educational improvement, economic opportunity and social advancement and, thereby, to promote the national well-being. The local chapter is the Grays Harbor/Pacific County Farm Bureau.
Washington State Dairy Association	The Washington State Dairy Federation develops and promotes initiatives directed toward the financial strength, political support, and public awareness of the dairy industry to achieve a successful business climate in Washington State.
Washington FFA Association	FFA delivers programs to youth to foster leadership, personal growth, and career success through agricultural education. Agricultural education instruction is delivered through: classroom/laboratory instruction; supervised agricultural experience programs (work-based learning); and student leadership organizations, such as National FFA Organization, National Young Farmer Educational Association and National Post-Secondary Agricultural Student Organization. Local county chapters are in Aberdeen, Montesano, and Elma.

Other Potential Resources

There are numerous resources available that the Work Group and GHCD can access not exclusively linked to agricultural programs. Using these resources depend on creative program and project development ideas.

Conservation Land Trusts

Land trusts are charitable organizations that acquire land or conservation easements to achieve conservation purposes. They often focus on protecting natural habitat, water quality, scenic views, recreation uses, forestry, and agricultural uses. While there are numerous land trusts, the following ones focus on lands in Grays Harbor County:

- Chehalis River Basin Land Trust
- Capitol Land Trust
- Center for Natural Lands Management
- Forterra
- The Nature Conservancy

There are land trusts specifically oriented towards protecting agricultural lands, although none have operated in Grays Harbor County in the past. The PCC Land Trust operates in the state, with an acquisition in 2015 in nearby Rochester. Agricultural land trusts typically provide three approaches to protection:

- Conservation easements: A conservation easement is a voluntary legal agreement between a landowner and a qualified land trust where the landowner agrees to restrict certain uses of the land as they continue managing it. The trust holds the agricultural conservation easement with a landowner, which ensure that the property is forever in agricultural use. In exchange for the permanent removal of a farm's development rights, the trust pays the landowner for the value of those rights, and commit to stewarding the soil, water, and open space on that property in perpetuity.

- Simultaneous sale: For farmers who are ready to purchase property but limited by the cost of land, a trust will arrange a "simultaneous sale," wherein the trust purchases a conservation easement simultaneous to the farmer purchasing the land. This enables a farm buyer to purchase land at the true agricultural value and ensures that the property is protected as farmland forever.

- Buy-protect-sell: Like a simultaneous sale, buy-protect-sell is a strategy designed to support landowners limited by land costs. To implement buy-protect-sell, a trust raises the capital necessary to purchase farmland and get it off the market quickly. This removes development potential through a conservation easement. With development rights removed, farmers can lease or purchase the property over time at a more affordable rate.

Nonprofit Foundations

Nonprofit foundations are a non-governmental organization with the purpose of making grants to organizations for charitable purposes. Each foundation typically has a focus for giving, usually to an established entity such as a local nonprofit organization or government.

The Work Group has an excellent chance of acquiring funding for specific projects or programs for VSP. Success will depend on careful project or program planning, researching which foundations are the best match to pursue, and grant writing skills. An excellent initial project for GHCD is to conduct a research project for matching Work Plan goals with potential foundation funders.

Appendix E:
Summary of Key Critical Area Environmental Regulations Applying to Agriculture

The Voluntary Stewardship Program (VSP) is a nonregulatory, alternative approach under the Growth Management Act for protecting critical areas on agricultural lands. Through the Work Plan, VSP provides a unique opportunity to complement other laws designed to protect water quality and fish habitat.[24]

VSP is not a replacement for compliance with other federal, state, and county laws and regulations that may regulate activities on critical areas. VSP legislation emphasizes this by stating:

> "Nothing in RCW 36.70A.700 through 36.70A.760 may be construed to… (5) Limit the authority of a state agency, local government, or landowner to carry out its obligations under any other federal, state, or local law."[25]

VSP, along with the complement of these other laws and regulations, contribute to the overall protection of critical area-related benchmarks in the Work Plan.

The purpose of this appendix is to inventory the most common of these regulations that may apply to agricultural lands and activities with critical areas. Please note that this appendix in not an all-inclusive list of laws and rules potentially impacting agricultural producers and is meant for general information purposes only.

It is important to emphasize that the Work Plan, the Work Group, and the Grays Harbor Conservation District (GHCD) do not enforce or participate in the enforcement of any laws and regulations inventoried in this appendix. Please contact the appropriate federal, state, or county representatives regarding questions about the application of these laws and regulations to specific agricultural lands and activities.

Abbreviations used in this appendix include the following:

- CARA: Critical Aquifer Recharge Area
- FFA: Frequently Flooded Areas
- FWHCA: Fish & Wildlife Habitat Conservation Areas
- GHA: Geologically Hazardous Areas
- GHCC: Grays Harbor County Code
- RCW: Revised Code of Washington
- US EPA: US Environmental Protection Agency
- USDA: US Department of Agriculture
- USACE: US Army Corps of Engineers
- WAC: Washington Administrative Code

- WDFW: Washington Department of Fish & Wildlife
- WDOE: Washington Department of Ecology
- WSDA: Washington State Department of Agriculture

Federal Acts and Regulations

Congress has adopted a variety of laws (Acts) that establish requirements related to managing activities that may affect agricultural activities on lands with critical areas.

Federal Law	Farming Practices Affected	Intersection w/ Critical Areas
Agricultural Act of 2014 Public Law 113-79 Conservation, Title II USDA	• Producers who fail to apply approved soil conservation plans on highly erodible cropland or who drain wetlands could become ineligible for agricultural programs, including commodity programs, conservation programs, disaster assistance, and crop insurance premium subsidies.	Wetlands
Clean Water Act 33 U.S.C. §1251 et seq. (1972) US EPA, USACE & WDOE[26]	• EPA administers the Act through WDOE. The following regulations fall under the act o Section 303. Water Quality Standards & Implementation Plans sets standards for water quality, identifies impaired waters, & total maximum daily loads (TMDL) o Section 402. National Pollutant Discharge Elimination Systems (NPDES) requires permits for point-source discharges and limits pesticide applications to waterbodies. o Section 404. Discharge of Dredged & Fill Material requires permits for converting wetlands to agricultural lands. Some exemptions apply to cranberry production.	Wetlands FWHCA
Safe Water Drinking Act 42 U.S.C. §300f et seq. (1974) US EPA & WDOE	• Regulates small drinking water systems for human consumption serving 25 or more people or 15 service connections more than 59 days per year • Regulates discharges to ground to protect drinking water sources	CARA
Federal Insecticide, Fungicide, & Rodenticide Act 7 U.S.C. §136 et seq. (1996) US EPA	• Regulates the safe distribution & application of pesticide chemicals & containers	Wetlands FWHCA CARA
Resource Conservation & Recovery Act 42 U.S.C. §6901 et seq. (1976) US EPA	• Regulates underground storage tanks with capacity greater than 1,000 gallons of motor fuel • Tanks holding 110 gallons or more of heating oil, septic	CARA

The US EPA website, Agriculture: Laws and Regulations that Apply to Your Agricultural Operation by Statute, is an excellent resource that provides additional information and greater detail on federal regulations applicable to agriculture. It can be accessed at:

https://www.epa.gov/agriculture/agriculture-laws-and-regulations-apply-your-agricultural-operation-statute#CWA-SDWA.

USDA provides an expanded summary of the 2014 Farm Bill available at this website: https://www.usda.gov/sites/default/files/documents/usda-2014-farm-bill-highlights.pdf.

State of Washington Laws and Administrative Code

The State of Washington has a wide range of laws and regulations directly and indirectly governing agricultural activities. The Revised Code of Washington (RCW) is the official compilation of these laws. Many of these laws direct state agencies to adopt and enforce more specific administrative rules related for implementing them. The Washington Administrative Code (WAC) is the official compilation of these rules.

RCWs and WACs are organized by Title and Chapter. The example below shows the relationship between a state law and agency rules:

RCW

- Title 90, Water Rights - Environment
  - Chapter 90.64, Dairy Nutrient Management

WAC

- Title 16, Department of Agriculture
  - Chapter 16-611, Nutrient Management

It is necessary to consult both the law and the administrative rules for a full understanding of all requirements.

The table below is a summary of the state laws and administrative regulations that frequently govern agricultural activities on critical areas that apply to agricultural lands outside of the VSP Work Plan.

State Laws/Rules	Agricultural Practices Affected	Intersection w/ Critical Areas
Agriculture and Marketing Title 15 RCW	• Regulates a broad range or agricultural practices that may directly or indirectly affect some critical areas - RCW 15.04.110 Control of Predatory Birds - RCW 15.54 Fertilizers, Minerals, and Limes establishes requirements to protect human health and environment - RCW 15.58 Washington Pesticide Control Act governs the formulation, distribution, storage, transportation, and disposal of pesticides	Wetlands CARA FWHCA

State Laws/Rules	Agricultural Practices Affected	Intersection w/ Critical Areas
Animals & Livestock Title 16 RCW	• Regulates a broad range or agricultural practices that may directly or indirectly affect some critical areas (including feed lots, fencing, disposal of dead animals, reporting of diseases, pesticide & fertilizer use, nutrient management). Administrative rules follow in Chapter 16 WAC.	CARA FWHCA
Department of Agriculture Title 16 WAC	• Covers WSDA rules related to the following - WAC 16-25 Disposal of Dead Livestock sets procedures for disposing of dead livestock - WAC 16-200 Grain and Chemical covers storage and application of fertilizers, herbicides, & pesticides - WAC 16-202 Application of Pesticides and Plant Nutrients through Irrigation Systems - WAC 16-611 Nutrient Management establishes procedures for nutrient management recordkeeping, discharge of pollutants, & civil penalties for RCW 90.64 - WAC 16-750 State Noxious Weed List & Schedule of Monetary Penalties identifies noxious weeds by Site Class and establishes State Weed Control Board	Wetlands CARA FWHCA
Weeds, Rodents, and Pests Title 17 RCW	• Includes provisions for the following - RCW 17.10 Noxious Weeds – Control Boards enabling legislation for Grays Harbor County Noxious Weed Control Board - RCW 17.21 Pesticide Application Act establishes requirements for safe use and application methods	Wetlands CARA FWHCA
Growth Management Act Ch. 36.70A RCW	• Requires counties to adopt comprehensive plans and development regulations to avoid uncoordinated and unplanned growth - RCW 36.70A.030 Definitions defines critical areas - RCW 36.70A.130 (8) (b) (iv) allows counties that opt into VSP to adopt regulations necessary to address a threat to human health or safety - RCW 36.70A.700 through .760 Voluntary Stewardship Program establishes the program; ▪ RCW 36.70A.720 (1) (h) allows the Work Group to incorporate into the Work Plan any existing development regulations relied upon to achieve the goals and benchmarks for protection.	Wetlands CARA FWHCA FFA GHA

State Laws/Rules	Agricultural Practices Affected	Intersection w/ Critical Areas
Protection of Critical Areas WAC 365-196-830	• Establishes procedural requirements for comprehensive plans and development regulations. - WAC 365-196-830 Protection of Critical Areas establishes guidelines for protecting critical areas, including defining protection and relationship to function and values ▪ WAC 365-196-830 (8) allows local government to develop alternative means of protecting critical areas, assure no loss of functions, and use best available science. Also states local governments hall not broadly exempt agricultural activities from their critical areas regulations.	Wetlands CARA FWHCA FFA GHA
Wildlife Damage Chapter 77.36	• Allows for the killing of wildlife threatening human safety or causing property damage; allows for the establishment of rules (see WAC 220-440)	FWHCA
Fish & Wildlife Title 220 WAC	• Regulates fish and wildlife resources, particularly - Chapters 220-440 Wildlife Management and Wildlife Interaction establishes allowances for damage prevention from wildlife to property, crops and livestock - Chapter 220-660 WAC Hydraulic Code, establishes permitting for the construction or performance of work that uses, diverts, obstructs, or changes the natural flow or bed of any salt or fresh waters of the state	Wetlands FWHCA
Floodplain Management Ch. 86.16 RCW	• Statewide floodplain management exercised through county administration of National Flood Insurance Program regulations	FFA GHA
Water Rights – Environment Title 90 RCW	• Regulates various aspects of water rights and quality, including - RCW 90.03 Water Code - RCW 90.48 Water Pollution Control Act - RCW 90.58 Shoreline Management Act - RCW 90.64 Dairy Nutrient Management (see WAC 16-611) - RCW 90.66 Family Farm Water Act permits right to withdraw water for irrigation use of family farm - RCW 90.76 Underground Storage Tanks	Wetlands FWHCA CARA

State Laws/Rules	Agricultural Practices Affected	Intersection w/ Critical Areas
Department of Ecology Title 173 WAC	• Regulates a broad range of requirements that may affect agricultural lands with critical areas: - WAC 173-18 Shoreline Management Act – Streams & Rivers Constituting Shorelines of the State - WAC 173-152 Water Rights - WAC 173-160 Minimum Standards for Construction and Maintenance of Wells - WAC 173-220 National Pollutant Discharge Elimination System Permit Program - WAC 173-522 Water Resources Program in the Chehalis River Basin, WRIA-22 and 23	Wetlands CARA FWHCA

Grays Harbor County

County Code	Agricultural Practices Affected	Intersection w/ Critical Areas
Buildings & Construction Title 15	• May place requirements on buildings in geologically hazardous areas	GHA
Shoreline Master Program (To be adopted)	• Includes policies protecting existing agricultural lands within Shoreline jurisdiction • Requires new agricultural activities to be consistent with SMP goals, policies, & regulations	Wetlands FWHCA FFA GHA
Frequently Flooded Areas GHCC 18.06.100-130	• Local requirements for compliance for RCW 86.16 and National Flood Insurance Program	FFA GHA

Bibliography

American Farmland Trust (August 2013). *The Adoption of Conservation Practices in Agriculture*. Washington, D.C.

Campbell, S., Waddell, K., & Gray, A. (2010). *Washington's forest resources, 2002-2006: five-year Forest Inventory and Analysis report*. General Technical Report-Pacific Northwest Research Station, USDA Forest Service, (PNW-GTR-800).

Chapman, Benjamin, Kreske, Audrey, & McReynolds, Roland North Carolina State University & the Carolina Farm Stewardship Association. *"Good Agricultural Practices for Small Diversified Farms. Tips and Strategies to Reduce Risk and Pass an Audit."*

Chesapeake Bay Foundation (2010). *Forested Buffers through United States Department of Agriculture's Conservation Reserve Enhancement Program*.

Cobourn, John and Lewis, Steven R. (2011). *Agriculture is a Good Fit in Floodplains*. Reno, NV: University of Nevada Cooperative Extension.

Cohen, Spencer. (2015). *Washington State Agriculture & Food Processing – Economic/Fiscal Impact Study*. Seattle: Community Attributes, Inc.

Daniels, J. M. (2004). *Assessing socioeconomic resiliency in Washington counties.*

Gendaszek, Andrew S. *Hydrogeologic framework and groundwater/surfacewater interactions of the Chehalis River basin, southwestern Washington*. US Geological Survey, Tacoma, Washington (2011).

Grays Harbor County (May 1981). *Agricultural Element of the Grays Harbor County Comprehensive Plan*. Montesano, WA.

Johansson, R. (2017). *Falling Response Rates to USDA Crop Surveys: Why It Matters. farmdoc daily*, *7*(7): 9).

Kauppila, Dennis, Rogers, Glenn, & Peabody, Mary. (November 2007) *Is My Farm a Hobby or a Business?* University of Vermont Extension, Colchester, VT.

Low, H. M. (2014). *Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Pacific Northwest Basin*.

MacGowan, Brian J. and Miller, Brian K. (2002). *The Basics of Managing Wildlife on Agricultural Lands.* West Lafayette, IN, Purdue University,

Morgan, Laurie. (2005). *Critical Aquifer Recharge Areas: Guidance Document.* Olympia: Washington State Department of Ecology

National Conservation Planning Partnership. *Conservation Planning*. NRCS, USDA.

Natural Resources Conservation Service, US Department of Agriculture. (February 2010). *"What is a Conservation Plan?"*

Natural Resources Conservation Service, US Department of Agriculture. (1999). *Core4 Conservation Practices Training Guide: The Common Sense Approach to Natural Resources Conservation. pp. 4.7-4.40, 44.65-44.76, 44.131-134.150): USDA*.

Natural Resources Conservation Service, US Department of Agriculture. (undated). *Wildlife Conservation Practices for a Sustainable System*.

Natural Resources Conservation Service, US Department of Agriculture. (undated). *Wetlands and Conservation Compliance – What Every Iowa Farmer Needs to Know*. Des Moines, IA.

Pringle, R. F. (1986). *Soil Survey of Grays Harbor County Area, Pacific County, and Wahkiakum County, Washington*. US Soil Conservation Service, USDA.

Prokopy, Linda, Towery, Dan, & Babin, Nicholas (May 2014). *Adoption of Agricultural Conservation Practices: Insights from Research & Practice*. Forestry & Natural Resources, Purdue University. West Layfayette.

Resource Planning Unlimited, Inc. (2013). *Idaho Agricultural Best Management Practices*. Boise: Idaho Soil Conservation Commission and Idaho Department of Environmental Quality.

Ryan, R. L., Erickson, D. L., & De Young, R. (2003). *Farmers' motivations for adopting conservation practices along riparian zones in a mid-western agricultural watershed*. Journal of Environmental Planning and Management, 46(1), 19-37.

Schartz, Steve, Shute, Lindsey L., Ackoff, Sophie, & Kane, Eleanor (2013). *Farmland Conservation 2.0: How Land Trusts Can Protect America's Working Farms*. National Young Farmers Coalition.

Social Sciences Team, NRCS, USDA (June 2005). *The Adoption and Diffusion of Conservation Technologies*. People, Partnerships, and Communities Issue 7.

The Federal Interagency Stream Restoration Working Group. (2001). *Stream Corridor Restoration – Principles, Processes, and Practices*.

The Ramsar Convention on Wetlands (2014). *Wetlands & Agriculture: Partners for Growth*. Gland, Switzerland.

Upadhyay, Bharat M., Young, Douglas, L., Wang, Holly H., and Wandschneider, Phillip. (2002). *How do farmers who adopt multiple conservation practices differ from their neighbors?* Long Beach, CA: AAEA and WAEA 2002 Annual Meeting.

US Army Corps of Engineers, New England District (1999). *The Highway Methodology Workbook*, *Supplement*.

US Environmental Protection Agency (2015). *Getting up to Speed on Groundwater Contamination*.

Sather, J.H. and Smith, R.D. (1984). *An Overview of Major Wetland Functions and Values.* Fort Collins, CO: US Fish and Wildlife Service.

Washington Department of Agriculture (2008). *Washington Agriculture-Strategic Plan 2020 and Beyond*. Olympia.

Washington Department of Agriculture (2011). *Flood Information and resources for Farmers and Ranchers*. Olympia.

Morgan, Laurie. (2005). *Critical Aquifer Recharge Areas – Guidance Document*. Olympia: Washington State Department of Ecology.

Texas Water Development Board. *Agricultural Water Conservation Practices*.

Washington State Department of Ecology (2016). Washington Nitrate Prioritization Project. Olympia.

Washington Department of Fish and Wildlife (May 2013). Water Crossing Design Guidelines. Olympia.

Washington Department of Revenue (2016). Tax Statistics 2015. Olympia.

William D. Ruckelshaus Center (November 2014). *Governor's Chehalis Basin Work Group 2014 Recommendation Report*.

Wright, James M., P.E. (2007). *Floodplain Management – Principles and Current Practices, Chapter 8, Floodplain Natural Resources and Functions*. Knoxville, TN: The University of Tennessee.

Internet sites:

Farmland Information Center. On-Farm Conservation. http://www.farmlandinfo.org/landowner-options/improve-farm-conservation

Hobby Farms – Saving the Farm. https://www.hobbyfarms.com/saving-the-farm-2/

US Department of Agriculture:

Conservation Programs. www.fsa.usda.gov/programs-and-services/conservation-programs/index

Conservation Practices. www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

National Agricultural Statistics Service. www.nass.usda.gov/Data_and_Statistics/

Washington State Department of Agriculture:

Agricultural Land Use. https://agr.wa.gov/pestfert/natresources/aglanduse.aspx

Washington State Department of Ecology. Water Quality Assessment & 303(d) List. https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d

Whatcom Conservation District. Farm Planning. Small Farm. http://www.whatcomcd.org/small-farm

Endnotes

[1] See RCW 36.70A.700 through 36.70A.904
[2] RCW 36.70A.700
[3] WAC 173-26-020 provides distinct definition for "agricultural activities,' "agricultural products," "agricultural equipment." "agricultural land," and "aquaculture."
[4] RCW 36.70A.720 (1)
[5] http://www.visitgraysharbor.com/p/getinvolved/285
[6] http://www.graysharbor.org/business/starting-business.php
[7] http://www.agbizcenter.org/
[8] RCW 36.70A.715, Funding by commission-County's duties-Watershed group established.
[9] For example, the producer may elect to implement filter strips at a lesser standard than required by the CREP program.
[10] Rogers and Shoemaker (1971) describes these individuals as having above average income, greater number of years of formal education, high number of agency contacts, high participation rates in agricultural organizations, greater reliance on mass media, high awareness of conservation problems, willingness to take risks, full-time producer, and desire to pass farm/ ranch on to children.
[11] For a good description of Normalized Difference Vegetation Index, see https://earthobservatory.nasa.gov/Features/MeasuringVegetation/measuring_vegetation_1.php
[12] Application of the Normalized Difference Vegetation Index (NDVI) will facilitate comparisons between the two aerial images that will reveal physical changes to critical areas. NDVI can note these changes between two images by detecting changes in light wavelengths. For example, if an agricultural parcel converted an intact riparian corridor to pastureland in 2015, NDVI would reveal that landscape change. Similarly, the restoration of a riparian corridor on former pastureland is detectable as well.
[13] https://fortress.wa.gov/ecy/approvedwqa/ApprovedSearch.aspx
[14] https://fortress.wa.gov/doh/eh/dw/swap/maps/
[15] RCW 36.70A.720 (2) (b) (i). The first Five-Year Status Report is due March 21, 2021
[16] RCW 36.70A.720 (1) (j)
[17] RCW 36.70A.720 (2) (b) (i) through (iv)
[18] RCW 36.70A.720 (2) (c)
[19] Contract K1646 between the Washington State Conservation Commission and Grays Harbor County.
[20] August 15, 2016 Letters to Fawn Sharp, President, Quinault Indian Nation, and Don Seneca, Chairman, Confederated Tribes of the Chehalis Reservation
[21] Email outreach to Garrett Dalan, The Nature Conservancy; Janet Strong, Chehalis Basin Land Trust and Grays Harbor Audubon; Luke Kelly, Trout Unlimited.
[22] Conservation Practice Lifespans in Washington, November 2017. Accessed at: https://efotg.sc.egov.usda.gov/references/public/WA/CP_Lifespans_in_WA_110117.pdf
[23] NRCS project list obtained through Christopher Wright, Resource Conservationist Wenatchee Field Office, 02/13/17
[24] RCW 36.70A.700 (1) (f)
[25] 36.70A.702 Construction
[26] While these are federal laws, the State of Washington Department of Ecology administers them within the state

Grays Harbor County

Voluntary Stewardship Program

Appendix F

Work Plan Background Information

September 17, 2018

Table of Contents

Introduction

Appendix F provides supporting documentation to the Work Plan for the Grays Harbor County Voluntary Stewardship Program (VSP). In this report:

- Section One provides a general overview of the county;
- Section Two covers information about the scope and extent of agriculture in Grays Harbor County;
- Section Three inventories provides a general overview of critical areas on agricultural lands conditions as of July 22, 2011 on a watershed and subbasin scale;
- Section Four provides a detailed examination of critical areas on known agricultural lands in the county within the Chehalis and North River subbasins; and
- Section Five summarizes key plans, studies, data resources on management actions for voluntarily protecting or enhancing critical area functions and values in the county.

How the Work Group Used Appendix F to Prepare the Work Plan

Critical area information in the report was important for the Work Group to analyze how critical areas intersect with agricultural lands, identify the most important management objectives to protect and enhance functions and value, and select key stewardship practices that would implement those strategies. This in turn led to the development of the five critical area benchmarks for the plan.

The agricultural profile aided the Work Group in assessing agricultural needs in the county that led to the development of seven benchmarks for ensuring the long-term viability of agriculture and the preventing the conversion of agricultural land to other uses.

How to Use Appendix F when Preparing Individual Stewardship Plans

Appendix F is an important information resource for both the Work Group and the Technical Provider. Inventory information about agriculture and critical areas establish a baseline to evaluate future landscape changes, their scope, and impact at a watershed scale. The subbasin profiles allow pinpointing areas within watersheds where critical areas may be at the greatest presence – a valuable resource for focusing stewardship efforts into areas that will deliver their highest return.

Finally, the general survey of management plans directs the Technical Provider to resource plans, studies, and data providing in-depth detail on implementation actions for a specific critical area as well as potential coordination efforts with other entities.

Accompanying Appendix F are working products consisting of .KMZ files for use with Google Earth in locating agricultural activities, agricultural properties, and critical areas within the county at a parcel level. The .KMZ format allows any person with a computer to view these GIS layers with the downloadable free Google Earth program.

These .KMZ files allow Work Group members, the Technical Provider, and individual agricultural operators to connect and analyze the general location of critical areas in Appendix F with aerial imagery and data layers. These files will be particularly useful in the future as the Work Group and the Technical Provider continues to analyze the impacts of stewardship practices, strategize where to focus resources, and develop Individual Stewardship Plans. KMZ layers with an asterisk have additional data imbedded into the layer providing detail about topic. KMZ files will be updated every six months or whenever new data becomes available.

The following .KMZ files used to compile this report and are available for use include:

.KMZ File	Subject
Ag - Wetlands.kmz	Agricultural lands in designated wetlands
Ag – FFA.kmz	Agricultural lands in designated frequently flooded areas
Ag FWHC.kmz	Agricultural lands with PHS overlay
Ag GHA – Landslide.kmz	Agricultural lands in designated landslide areas
Ag GHA – Seismic.kmz	Agricultural lands in designated seismic hazard zones
Ag GHA – Tsunami.kmz	Agricultural lands in designated Tsunami areas
Ag Zoning	County agricultural zoning map
Ag_Lands_Parcel.kmz	Agricultural lands designated Land Use Code 82, 83, 85.94, & 85.96
CARA.kmz	Agricultural lands in designated critical aquifer recharge areas
County_Outline.kmz	Grays Harbor County boundary
GH WRIA.kma	Boundaries of Water Resource Inventory Areas (WRIA) in Grays Harbor County
Subbasins WAU.kmz	Outline of subbasins and Watershed Administrative Units
Wellhead_Susceptibility.kmz	Wellhead areas for Group A and B water systems
Wildcat_Aquifer.kmz	Wildcat Aquifer
WSDA_Crop_Survey 2016.kmz	WSDA Crop Survey

Accompanying Excel spreadsheets provide specific detail by parcel, land use code, and ownership data.

Section One:

Grays Harbor County Overview

Grays Harbor County, located on the southwestern cornerstone of the Olympic Peninsula, has a total land area of 2,224 square miles, of which 322 square miles is water. The county is the 15th largest in Washington State.

The topography of the county is diverse. The Olympic Mountains form the northern border of the county, the Willapa Hills to the south, and the Pacific Coastline to the west. Steep foothills fill the remainder of the county except for eight major river valleys: the Chehalis, Satsop, Wynoochee, Wishkah, Hoquiam, Humptulips, North, and Quinault Rivers. The Grays Harbor Estuary, the mouth of the Chehalis River, is a major feature of the county that extends 25 miles inland and covers 58,000 acres.

Waterbodies are a prominent feature of Grays Harbor County and are divided into four Watershed Resource Inventory Areas (WRIA): the Queets-Quinault (WRIA 21), the Lower Chehalis (WRIA 22), the Upper Chehalis (WRIA 23), and the Willapa (WRIA 24). The Lower and Upper Chehalis (22 & 23) are the largest of the four WRIA in the county and extends into Lewis, Thurston, and Mason Counties to form the second largest watershed in the state.

The county experiences cool and comparatively dry summers and mild, wet winters. The annual temperature range is relatively narrow; average daily temperatures in the summer is 60 to 62 degrees F and 41 to 42 degrees F in winter. Precipitation ranges from 65 to 75 inches along the Pacific Coastline, 80 to 90 inches in the foothills, 100 inches in the Willapa Hills, and 125 to 150 inches along the windward slopes of the Olympic Mountains.

Commercial forestry is the dominant land use in the county and encompasses nearly 1,170 square miles. It has the second highest proportion of forestland of Washington's 30 counties (88.9%). In 2006, Grays Harbor County contributed the largest volume of logs to in-state mills at 364 million board feet. Other major land uses in the unincorporated county include rural residential (5.1%) and agriculture (2.6%).

The county population as of April 2017 was estimated at 72,970. A majority of the county population lives within nine incorporated cities (44,359). The unincorporated areas of the county have a population of 28,438, or 39% of the total county population. Two American Indian Reservations, the Chehalis and the Quinault, lie within the county's boundaries.

Section Two:

Agricultural Profile

Agriculture Overview

The rich alluvial soils of the Chehalis River and its tributaries have contributed to the growth of commercial agriculture in Grays Harbor County. The history of farming in the county began in the late 1880's to serve diverse local needs. Today, agricultural in the county has shifted to serving more regional markets with a focus on field crops, hay, haylage, forage, greenchop, and dairy and beef livestock. The unique soils along the coastal areas of Grayland and North Cove have contributed to cranberry production and processing.[1]

In addition to its commercial agricultural operations, the county has numerous small farms and ranches that serve the personal needs of residents.

VSP Agricultural Definitions

The Voluntary Stewardship Program (VSP) adopts definitions from the Shoreline Management Act (SMA) and its administrative rules for "agricultural activities," "agricultural products," "agricultural equipment," and "agricultural land."[2]

- **"Agricultural activities"** means agricultural uses and practices including, but not limited to: Producing, breeding, or increasing agricultural products; rotating and changing agricultural crops; allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded; allowing land used for agricultural activities to lie dormant as a result of adverse agricultural market conditions; allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program, or the land is subject to a conservation easement; conducting agricultural operations; maintaining, repairing, and replacing agricultural equipment; maintaining, repairing, and replacing agricultural facilities, provided that the replacement facility is no closer to the shoreline than the original facility; and maintaining agricultural lands under production or cultivation.

- **"Agricultural products"** includes, but is not limited to, horticultural, viticultural, floricultural, vegetable, fruit, berry, grain, hops, hay, straw, turf, sod, seed, and apiary products; feed or forage for livestock; Christmas trees; hybrid cottonwood and similar hardwood trees grown as crops and harvested within twenty years of planting; and livestock including both the animals themselves and animal products

including, but not limited to, meat, upland finfish, poultry and poultry products, and dairy products.

- **"Agricultural equipment"** and **"agricultural facilities"** includes, but is not limited to:
    - The following used in agricultural operations: Equipment; machinery; constructed shelters, buildings, and ponds; fences; upland finfish rearing facilities; water diversion, withdrawal, conveyance, and use equipment and facilities including, but not limited to, pumps, pipes, tapes, canals, ditches, and drains;
    - Corridors and facilities for transporting personnel, livestock, and equipment to, from, and within agricultural lands;
    - Farm residences and associated equipment, lands, and facilities; and
    - Roadside stands and on-farm markets for marketing fruit or vegetables;
- **"Agricultural land"** means those specific land areas on which agricultural activities are conducted.

It is important to recognize that these definitions under VSP are very inclusive of the scope and extent of agricultural activities; it ranges from a homeowner engaged in farming or animal husbandry for their personal needs all the way to the large commercial farm or ranch.

Despite the county's designation of aquaculture as an agricultural activity, the SMA defines it independent of agriculture.[3]

- "Aquaculture" means the culture or farming of fish, shellfish, or other aquatic plants and animals. Aquaculture does not include the harvest of wild geoduck associated with the state managed wildstock geoduck fishery.

This distinction between the two definitions means that aquaculture does not fall under the provisions of the VSP. Although aquaculture remains under the regulatory approach for critical areas, there are no known restrictions to it benefitting from other aspects of a VSP Work Plan, including funding for projects that benefit critical areas.

Agricultural Statistics

Statistical data about agriculture in Grays Harbor County is available through a variety federal, state, and local sources. The primary data sets are from the Grays Harbor County Assessor, the USDA Census of Agriculture, and the Washington State Department of Agriculture survey. It is important to note that each data set has its limitations.

Location and Distribution of County Agriculture

The topography of Grays Harbor County greatly influences the location of farms and ranches. Most agriculture in the county is limited to the river valleys and coastal plains of the South Beach area, which creates a distinct linkage of agriculture to rivers and streams. Farms in the county generally increase in number and size as river valleys widen.

There is no exact number available for the number of farms and ranches in the county under the broad VSP definition for agriculture. While commercial agricultural operations are much easier to estimate, the sheer number of small, noncommercial agricultural operators is not.

The Grays Harbor County Assessor's Office provides a reasonable estimate as to the number of commercial agricultural operators in the county. Parcels assigned a specific land use code make them easily distinguishable as agricultural lands. These include:

- **Land use code 82** – Agricultural related activities
- **Land use code 83** – Agriculture Open Space Classified under RCW 84.34[4]
- **Land use code 84.96** – Open Space/Cranberry bogs
- **Land use code 86.97** – Cranberry bogs

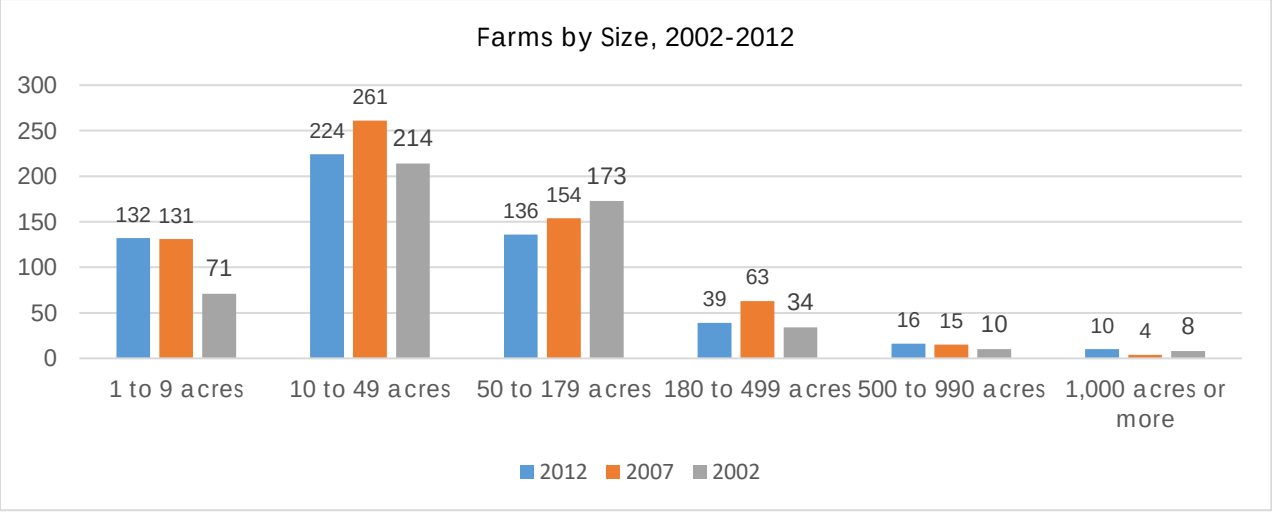
By sorting the Assessor's roles by land use with parcel ownership, it is possible to determine an estimated number of agricultural producers by WRIA and subbasin. The table below reveals the results of this process.

WRIA	Subbasin	# Acres	# Parcels	Number of Producers
21	Quinault Lake	40	2	1
22	Cloquallum	5,771	133	57
	Hoquiam-Wishkah	270	16	8
	Humptulips	429	31	13
	Satsop	6,448	332	58
	South Harbor	401	69	26
	Wynoochee	2,335	55	33
23	Black	1,858	57	24
	Lincoln	2,934	79	41
24	Little North – Vesta	215	11	5
	Totals	20,701	785	266

The major limitation to this data is that it does not account for those agricultural properties not listed under one of the four land use categories. Agricultural operations do occur on lands assigned to other land use codes, including Land Use Code 11, Residential.

Additional data is available through the USDA Census of Agriculture's National Agricultural Statistic Service (NASS). NASS data is collected through the Census of Agriculture, a complete count of U.S. farms and ranches and the people who operate them. Even small plots of land - whether rural or urban - growing fruit, vegetables or some food animals count if $1,000 or more of such products were raised and sold, or normally would have been sold, during the Census year.[5] The Census occurs every five years, but because participation rates by producers have declined in recent years, the accuracy of the data is not always reliable.[6] Caution must be exercised with all NASS data for this reason. It does, though, provide another, broader picture of the scope and extent of agriculture in the county. Unfortunately, Census data is released on a countywide level and is not translatable to specific subbasins.

Farms & acreage	2012	2007	2002
Number of farms	557	628	510
Land in farms (acres)	119,440	119,267	53,594[7]
Average size of farm (acres)	214	190	105



USDA Census of Agriculture County Data

Profile of Agricultural Producers

Principal operator by primary occupation	2012	2007	2002
• Farming	249	276	256
• Other	308	352	254

Age of principal operator	2012	2007	2002
• Average	60.4	57.8	52.5

Type of Organization, farms	2012	2007	2002
• Family or individual	483	542	494
• Partnership	18	48	20
• Corporation – Family held	20	27	15
• Corporation – Other held	3	1	2
• Other – coop, estate or trust, institutional	33	10	9

Value of Agricultural Products & Expenses

Market values	2012	2007	2002
Market Value of Ag Products Sold	$31,353,000	$32,821,000	$30,015,000
• Average per farm	$56,289	$52,263	$58,853
• Crops, including nursery & greenhouse	$16,697,000	$17,521,000	$13,936,000
• Livestock, poultry, & their products	$14,656,000	$15,301,000	$16,079,000

Farm expenses & Income	2012	2007	2002
Total production expenses average per farm	$60,253	$43,932	$56,301
Net cash income of operation average per farm	$2,311	$15,886	$3,062

Agricultural Products

Farms with livestock	2012	2007	2002
• Beef cows	211	238	231
• Milk cows	13	13	19
• Hogs and pigs	19	30	13
• Sheep and lambs	18	22	17
• Layers 20 weeks & older inventory	123	103	54
• Broilers & meat-type chickens	10	-	10

Irrigation use	2012	2007	2002
Irrigated farms	120	124	111
Total acres of irrigated land	22,055	16,304	16,304
• Harvested cropland, acres	14,198	9,911	7,117
• Pasture & other land, acres	2,137	2,209	1,705

Wheat and forage crops	Farms	Acres
Wheat for grain, 2012	13	2,281
Hay, including alfalfa, other tame, small grain & wild, 2012	195	10,130
All haylage, grass silage, and greenchop, 2012	62	4,592

Vegetables	Farms	Acres
Total Vegetables, potatoes, & melons harvested, 2012	43	6,588
• Beans, snap (bush and pole)	11	-
• Beets	4	1
• Broccoli	2	-
• Cabbage	2	-
• Carrots	9	4
• Cucumbers & pickles	8	4
• Lettuce	3	4
• Onions, dry	2	-
• Peas, green	23	5,509
• Potatoes	21	13
• Pumpkins	12	11
• Radishes	2	-
• Squash	5	1
• Sweet corn	12	-
• Tomatoes	4	16

Berries, fruits, & nuts	Farms	Acres
Land in Berries, 2012	42	329
Fruits, 2012		
• Apples	10	8
• Grapes	3	-
• Pears	4	-
All nuts, 2012	1	-

Floriculture & bedding crops	Farms	Under cover	Open
Floriculture and bedding crops, 2012	15	12,298 SF	37 acres

Christmas Trees	Farms	Acres	Trees cut
Cut Christmas trees, 2012	20	95	1,508

Woody Crops	Farms	Acres
Short rotation woody crops, 2012[8]	4	71

Organic Farming	Farms
USDA Nat'l Organic Program, certified organic production, 2012	7
USDA Nat'l Organic Program, organic production exempt from certification, 2012[9]	2
Total organic product sales	$2,068,000

Top crop items, 2012	State Rank
• Forage-land used for hay, haylage, grass silage, & greenchop	21
• All harvested vegetables	8
• Green peas	4
• Wheat for grain	19

Top livestock items, 2012	State Rank
• Cattle and calves	26
• Layers	25
• Broilers and other meat-type chickens	13
• Horses and ponies	21
• Goats, all	23

Washington State Department of Agriculture Data

In addition to the Census of Agriculture, the Washington State Department of Agriculture (WSDA) conducts periodic windshield surveys for inventory crop types being grown in the county. WSDA conducted its most recent survey in 2016.

The WSDA survey data is available in a GIS layer that allows calculating acreage by crop type at a watershed level. No information was collected within the Hoquiam-Wishkah watershed. As with the Census of Agriculture, it should be noted that there

may be inaccuracies in the WSDA data due to missed fields or misinterpretation of crop types.

County Wide Crop Types

Crop Type	Acres	Irrigated Acres	Percent Irrigated	Acres in Organic
• Apple	4.0	-	0.0%	-
• Barley	7.6	-	0.0%	-
• Bean, Green	193.3	193.32	100.0%	125.7
• Blueberries	1.6	-	0.0%	-
• Cabbage	51.6	51.55	100.0%	-
• Christmas trees	137.3	-	0.0%	-
• Corn, field	1,622.0	643.01	39.6%	-
• Corn, sweet	17.4	2.68	15.4%	-
• Cranberry	323.6	323.57	100.0%	
• Cucumber	3.3	-	0.0%	-
• Fallow	200.2	-	0.0%	-
• Flowers	22.6		0.0%	-
• Green manure	21.6	-	0.0%	-
• Hay, clover	71.4		0.0%	71.4
• Hay, grass	8,491.0	2,059.57	24.3%	388.8
• Market crops	159.6	38.49	24.1%	115.8
• Nursery, ornamental	131.4	129.75	98.7%	-
• Oats	67.9	-	0.0%	-
• Pasture	9,088.4	242.19	2.7%	132.8
• Pea, green	267.0	74.52	27.9%	-
• Poplar	192.5	-	0.0%	-
• Squash	11.4	-	0.0%	-
Totals	21,086.9	3,758.7	17.8%	834.4

Crop Types & Acres by Watershed

Crop Type	Black	Cloquallum	Humptulips	Lincoln	N.River	Satsop	S. Harbor	Wynoochee
• Apple	4.0	-						
• Barley	-	-				7.6		
• Bean, Green	-	193.3						
• Blueberries	-	-	1.6					
• Cabbage	-	-				51.6		
• Christmas trees	34.8	8.9				73.6		20.1
• Corn, field	-	213.6				1,408.4		
• Corn, sweet	-	-				17.4		
• Cranberry	-	-	65.0				258.5	
• Cucumber	-	-				3.3		
• Fallow	13.3	41.2					7.7	
• Flowers	-	22.6						
• Green manure	-	21.6						
• Hay, clover	-							71.4
• Hay, grass	833.8	2,564.9	126.3	1,706.8		1,999.8		1,259.5
• Market crops	-	5.4	1.6	115.8				
• Nurseries	-	128.0	0.5			2.9		36.9
• Oats	-	67.9						
• Pasture	944.8	2,460.3	767.5	1,154.2	134.1	2,709.7	14.7	903.2
• Pea, green	-	-				267.0		
• Poplar	-	114.0				57.1		21.5
• Squash	-			-		11.4		
Totals	1,830.6	5,841.7	962.7	2,976.7	134.1	6,609.8	280.9	2,312.4

SWOT Analysis of County Agriculture

At their November 2016 meeting, the VSP Work Group undertook an analysis of the current state of agriculture in the county by examining its strengths, weaknesses, opportunities, and threats.

Strengths

Strengths are positive attributes within our county that could enhance the future viability of agriculture.

- The current comprehensive plan and zoning ordinance protects and avoids conversion of agricultural lands – large lot zoning currently in place
- We have a county government that is pro-agriculture
- Agriculture is viewed positively by county citizens
- We have a transportation and processing infrastructure that supports local agriculture
- Current Use open space is a plus in this county – it is often abused in the urbanized counties
- The amount of civic involvement by the agricultural community in this county
- Ag producers currently are doing good things
- The Port of Grays Harbor and its role in agriculture
- High level of generational local knowledge with farm community
- Diversity of Grays Harbor agriculture – wide variety of farm products
- There is still room for agriculture to grow in our county
- Lewis County agricultural processors (canning, dairy) are close by
- Local processing facilities for cranberries and shellfish
- Multigenerational farms in place, and hopefully will remain
- Right-to-Farm legislation already adopted in the county
- There are already good cost sharing programs available to help ag

Weaknesses

Weaknesses are negative factors within our county that might hinder the future viability of agriculture.

- Lack of Port, rail, and processing facilities
- Restrictions on water availability for agriculture
- Spread of invasive species already in the county, especially from publicly-owned lands
- Impact of divorces on farms and the resulting divisions of land and ownership
- Aging farmers – who will follow?
- Flooding and erosion that affects farmland
- The County Assessor is driving farms away from the Current Use Open Space Program
- Lack of stewardship awareness by small farms that cause issues for all of agriculture
- Impacts of residential on-site sewage disposal systems on water quality
- Available labor pool has become a problem for aquaculture and agriculture operations
- Lack of local educational training for agronomy, aquaculture
- Depredation by wildlife on agricultural operations (e.g. elk, geese)

Opportunities

Opportunities include positive influences <u>outside</u> of the county that could contribute to the future viability of agriculture.

- Becoming a county with farm-to-table growers
- Revise the zoning ordinance to allow a variety uses and activities on farmland that encourage its economic sustainability
- Potential for reduction in permitting requirements at federal level
- There is a potential for increases in cost share programs available for agriculture as VSP moves forward

Threats

Threats are negative factors <u>outside</u> of the county that could hinder the future viability of agriculture.

- State and federal permitting climate is becoming harder and more expensive with greater requirements for environmental protection
- Lack of responsiveness or timeliness of state and federal permitting agencies

- Actions through courts and Ecology that restrict water rights, including rights for exempt wells
- Inflexible buffer requirements
- Laws and regulations from Ecology, including Concentrated Animal Feeding Operation General Permit
- Invasive species coming into the county
- Development pressures; people looking for cheap land in our county
- Misinformation on social media regarding agriculture
- The state keeps buying properties and their loss from the tax rolls
- Amount of money going to the middleman instead of the producer
- Infrastructure degradation – impacts to on-farm structures
- Impacts of mortgage lenders when they force subdivision of land
- Diseases from out-of-county threaten local crops and aquaculture producers
- Climate change is altering our growing environment – on land and in water
- Expansion of cranberry production in Quebec and Wisconsin

Section Three:

Critical Areas on Agricultural Lands

The first part of this section provides a general overview of critical areas in Grays Harbor County existing at the time of the passage of VSP on July 22, 2011. It examines how the GMA defines each critical area, assesses their relationship to agricultural lands, and discusses their general location in the county.

The second part takes a closer look at the status of critical areas within each subbasin of WRIAs 22, 23, and 24. This will allow the Grays Harbor County Work Group to target specific outreach strategies towards certain critical areas.

The Work Group applied the information from this section to identify priority needs, formulate action plans, and set benchmarks for each critical area goal. They also will be relying on it to detect future changes to critical areas within the county's watersheds.

Critical Areas, Functions, & Values Overview

The Voluntary Stewardship Program (VSP) requires those counties enrolled in the program to maintain critical area functions and values as they existed on July 22, 2011, the date when the legislature adopted the program. In VSP, this date commonly is referenced as the "critical area baseline."

There are five critical areas identified and defined under the Growth Management Act (GMA) that are located on or adjacent to agricultural lands in Grays Harbor County. These include:

- Wetlands
- Areas with a critical recharging effect on aquifers used for potable water
- Fish and wildlife habitat conservation areas
- Frequently flooded areas
- Geologically hazardous areas

Protecting the functions and values of critical areas is a key provision of GMA. Functions are self-sustaining properties of a critical area that exist in the absence of human development. They form the natural physical or biological characteristics essential for supporting an ecosystem. Some critical areas share similar or identical functions; for instance, wetlands, fish and wildlife areas, and frequently flooded areas are important for recharging surface and groundwater resources.

Values are benefits to society that come from one or more critical areas functions. The value of a critical area is based on human judgment of the worth, merit, and quality, or importance attributed to their functions. For example, salmon depending on fish and wildlife habitat conservation areas, wetlands, frequently flooded areas contribute to the economic and social well-being of the county.

Although Grays Harbor County does not fully plan under the GMA, it is required to designate and protect critical areas. With VSP, however, protection of critical areas by agriculture is voluntary rather than regulatory.

Data used for Determining Critical Areas Baseline

It is important to exercise caution when evaluating the data in this chapter. Data on critical areas often is very general in nature at best and should be relied as a guide and not an exact representation of all conditions that existed as of July 22, 2011. Representations on maps similarly are intended for general reference; the only reliable methodology is field investigation, which is beyond the capabilities of this project. Any decisions made upon the data in this report shall be at the sole responsibility of the user.

The table below shows by critical area the primary data resources used to generate the critical area overview and individual subbasin profiles in this report. These data resources were layered over known commercial agricultural lands using information from the Grays Harbor County Assessor and the county's geographic information system (GIS).

Critical Area	Data Source
Wetlands	• USFWS National Wetlands Inventory, Wetlands Mapper[10] • 2011 Wetlands Inventory Map for Western Washington[11]
Aquifer Recharge Areas	• USGS Principle Aquifers of the 48 Conterminous US, et al.[12] • Wellhead protection areas – Grays Harbor County
Fish and Wildlife Habitat Conservation Areas	• Priority Habitats and Species (PHS) on the Web, WDFW[13] • Water Quality Assessment and 303(d) List, WDOE[14]
Frequently Flooded Areas	• National Flood Hazard Layer[15]
Geologically Hazardous Areas	• Washington Department of Natural Resources, Landslide Hazards[16] • Washington Department of Natural Resources, Liquefaction Susceptibility[17] • Washington Department of Natural Resources, Tsunami Inundation[18]

Additional data resources used in this report are from a variety of published reports and planning documents listed in the bibliography.

Wetlands

The definition for "wetlands" under the GMA consist of:

> "…areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands."[19]

An estimated 1,947 acres of farmland in the county have wetlands. Wetlands are present in many areas of the county, but are especially common in river and stream valleys where agricultural activities occur. In the past, many wetlands were converted to agricultural uses due to their excellent qualities for raising crops and livestock.

Wetlands perform valuable **functions** by providing:

- Groundwater recharge/surface water discharge: Wetlands are important for groundwater recharge and/or discharge to surface waters.
- Shoreline stabilization: Wetlands along rivers and streams act as a buffer against currents that cause excessive erosion.
- Groundwater recharge and streamflow maintenance: Wetlands store water and slowly release to ground and surface waters to maintain minimum water levels. This becomes particularly important during seasonal low flows when irrigation becomes necessary.
- Habitat for wildlife: Wetlands provide permanent or seasonal habitat for fish and wildlife.
- Sediment, nutrient, and chemical capture: Wetlands contribute to stream and aquifer health by capturing and filtering eroded soil and chemicals.
- Nutrient production export: The effectiveness of the wetland to produce food or useable products for humans and other living organisms.

Wetland values that benefit agriculture include:

- Flood flow alteration: Wetlands capture excess surface water from storms and slowly release it to rivers, lakes, and aquifers. This helps reduce flooding and erosion on agricultural properties.
- Water availability: Wetlands store and release water to streams and rivers during the summer months that serve irrigation needs.
- Recreation – consumptive and nonconsumptive uses: Wetlands provide recreational opportunities that include hunting and fishing.
- Natural pest control: Wetlands provide habitat for birds highly beneficial to agriculture by consuming insects and rodents.

Agriculture is a benefit to wetlands by its very nature of being a low-intensity adjacent land use. Cropland and pasture provide terrestrial species open access to wetlands while simultaneously minimizing human access and disturbance. Conversely, agricultural can hinder the function and value of wetlands by improperly applying fertilizers and pesticides, altering surface water drainage patterns that replenish water levels, or allowing livestock to access wetlands. Maintaining vegetated buffers that separate wetlands from agricultural activities is critical for protecting and enhancing functions and values.

Information about wetlands in the county is available as a GIS layer from the US Fish and Wildlife Service's National Wetlands Inventory. This data layer can identify specific parcels that potentially have wetlands on them. The main limitations to this data layer is that it does not always reveal the location of all wetlands and it often shows the presence of wetlands converted to agricultural uses long ago. Additional information about wetland conditions and restoration actions is available in plans and reports generated for salmon recovery and shoreline management planning.

Aquifers Used for Potable Water Supply

The GMA definition for areas with a critical recharging effect on aquifers used for potable water means those

"…areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge."[20]

Benefits. Aquifers recharge at locations where water collects (such as lakes, wetlands, flood plains, and streams) and infiltrates through permeable earth until it reaches the groundwater table.

Aquifers are important for providing a safe drinking water supply for individual wells and for small and municipal water systems. The reliance on individual wells for residential and operational purposes makes aquifer recharge areas especially important to agriculture.

Risks. Local conditions, especially soil type, sediments, and rock, will determine how freely that water passes through to the groundwater. Under certain site conditions, water can move quickly through the ground and carry contaminants into the groundwater. The potential for land uses contaminating aquifer recharge areas in these areas are the focus of concern.

Improperly conducted agricultural practices over highly susceptible soils potentially can contribute to the contamination of groundwater water supplies. Some application of fertilizers as well as concentrated deposits of animal wastes may increase nitrate levels in groundwater. To a lesser extent, accidental spills or leaks of pesticides, fuels, solvents, or other chemicals used in agriculture potentially may lead to groundwater contamination as well.

The low-intensity of agriculture as a land use is beneficial to maintaining the quality of aquifer recharge areas. Crop and pasture lands lack the impervious surfaces of other land uses that can restrict the recharging capability of land over aquifers. Furthermore, the absence of other high-intensity residential, commercial, and industrial land uses that normally contribute contaminants to soil make agriculture an appropriate use over aquifer recharge areas.

Potentially, there are 16,061 acres of farmland that may extend over aquifer recharge areas for potable water supply. The information used for identifying this acreage is very general. The US Geological Survey (USGS) developed the GIS layer "Principal Aquifers of the 48 Conterminous United States, Hawaii, Puerto Rico, and the US Virgin Islands" as a very general planning tool. Due to the scale incorporated into this layer, USGS cautions that its primary intended use is for regional and national data display and analysis rather than specific data analysis. However, this is the only countywide data currently available, and although it is included, its usefulness is limited.

Because existing information about the location and extent of aquifers is limited, the safest method for protecting these areas is through the application of best management practices, especially over highly susceptible soils. These practices are particularly important in those areas near wellhead protection areas for water systems or areas with concentrated residential development that rely on individual wells.

Fish and Wildlife Habitat Conservation Areas

GMA defines fish and wildlife habitat conservation areas (FWHCA) as:

"…land management for maintaining populations of species in suitable habitats within their natural geographic distribution so that the habitat available is sufficient to support viable populations over the long term and isolated subpopulations are not created. This does not mean maintaining all individuals of all species at all times, but it does mean not degrading or reducing populations or habitats so that they are no longer viable over the long term. Counties and cities should engage in cooperative planning and coordination to help assure long term population viability."

FWHCA in the county include:

- Areas where endangered, threatened, and sensitive species have a primary association
- Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat
- Waters of the state[21]
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity
- State natural area preserves, natural resource conservation areas, and state wildlife areas.

FWHCA extend over large areas of the county's agricultural lands – covering over 15,650 acres of farmland. Fish and wildlife live on, near, and migrate through many farms and ranches. Along with forestry, agriculture provides critical open space for fish and wildlife species. Good stewardship practices enable fish and wildlife resources to successfully coexist with agriculture.

Grays Harbor County has significant fish and wildlife resources within agricultural areas, with salmon being the most prominent species of concern. Chinook salmon, chum salmon, steelhead, and coastal cutthroat trout are widespread in the rivers that run through county farmlands. These waterbodies support critical spawning, feeding, and rearing habitats for salmon at various times in its lifecycles. While salmon populations in the Chehalis Basin remain relatively healthy compared to elsewhere in the state, fish numbers are far below historic levels.

There is also a great diversity of wildlife living on or migrating through agricultural lands. These include small and large mammals, birds, insects, amphibians, and reptiles. While many wildlife species are important to local cultural and subsistence needs, some

species, such as elk, deer, coyotes, and migratory geese, cause significant damage to farms and wildlife.

Poor or inadvertent practices by people can detrimentally impact FWHCA. The most common practices affecting FWHCA in the county result from reducing vegetation in riparian and habitat areas, increasing sediment run-off, excessively withdrawing water for irrigation, and introducing harmful bacteria and chemicals into waterbodies. These actions especially degrade salmon habitat. Upland species often face loss of unique habitats or disconnection of migratory routes.

Many bird, deer, and elk create significant impacts to farms as well. Birds, deer, and elk frequently create a nuisance by consuming or destroying large acreages of cropland. Predators, such as coyote or bear, pose a problem for young and small livestock. Uncontrolled nuisance wildlife can detrimentally impact the economic viability or sustainability of both commercial and noncommercial farms.

Some fish and wildlife species carry a special status under state and federal law due to their rarity or decline in numbers. Under the federal Endangered Species Act (ESA), there are no known species listed as "endangered" within agricultural areas. Several species of amphibians, birds, insects, and small mammals rate as "threatened" may potentially exist on or near agricultural lands.

WDFW's PHS on the Web maps can show where and the type of priority habitats and species are located on agricultural parcels within the county. This information can be examined to determine what protection measure might be needed for certain types of habitats and species.

Rivers, streams, and lakes are perhaps the most visible of the FWHCA habitats. Salmon populations are present throughout the county. The loss of riparian cover along streams, water withdrawals for irrigation, and excessive sedimentation from agricultural runoff can contribute to higher water temperatures, lower dissolved oxygen levels, and low summer flows that can significantly affect the survival of salmon. TMDL reports and 303(d) listings help identify where these impacts to critical areas occur on or near agricultural lands. However, it is important to note that the scale of agriculture in the county likely contributes to a relatively small percentage of the problem in comparison to the larger impacts of forestry and rural residential uses. For instance, high bacteria levels in a stream within an agricultural area may emanate from malfunctioning on-site sewage disposal systems from nearby residential properties or high concentrations of wildlife, such as elk or geese. Forestry activities, the dominant land use in the county, can increase sedimentation and water temperatures.

The primary sources of inventory data on FWHCA that intersect with agricultural lands come from WDFW and the two federal agencies responsible for managing the

Endangered Species Act (ESA), the US Fish and Wildlife Service (USFWS) and NOAA Fisheries. USFWS manages land and freshwater species while NOAA Fisheries manages marine species.

FWHCA Species

WDFW's PHS on the Web maps displays some level of FWHCA that extend over many agricultural lands within the county.[22]

The table below contains a list of WDFW Priority Habitats and Species in Grays Harbor County. If any of these habitats or species are suspected to be on property, the Technical Provider should consult the WDFW report Management Recommendations for Washington's Priority Species[23] for appropriate management actions.

Habitats	
Biodiversity areas & corridors	Caves
Cliffs	Coastal nearshore
Freshwater Wetlands &Fresh Deepwater	Herbaceous balds
Instream	Old-Growth/Mature Forest
Open coast nearshore	Oregon White Oak Woodland
Riparian	Snags and Logs
West Side Prairie	Talus

Fish Species	State Status
Pacific Lamprey	
River Lamprey	Candidate
Green Sturgeon	
White Sturgeon	
Olympic Mudminnow	Candidate
Pacific Herring	Candidate
Eulachon	Candidate
Longfin Smelt	
Surfsmelt	
Bull Trout/ Dolly Varden	Candidate *
Chinook Salmon	Candidate
Chum Salmon	Candidate
Coastal Res./ Searun Cutthroat	
Coho	
Kokanee	
Pink Salmon	
Rainbow Trout/Steelhead/Inland Redband Trout	Candidate**
Sockeye Salmon	Candidate
Pacific Cod	Candidate
Pacific Hake	Candidate

Fish Species	State Status
Walleye Pollock	Candidate
Black Rockfish	Candidate
Brown Rockfish	Candidate
Canary Rockfish	Candidate
China Rockfish	Candidate
Copper Rockfish	Candidate
Greenstripe Rockfish	Candidate
Quilback Rockfish	Candidate
Redstipe Rockfish	Candidate
Tiger Rockfish	Candidate
Widow Rockfish	Candidate
Yelloweye Rockfish	Candidate
Yellowtail Rockfish	Candidate
Lingcod	
Pacific Sand Lance	
English Sole	
Rock Sole	

* Bull trout only **Steelhead only

Amphibian Species	State Status
Dunn's Salamander	Candidate
Van Dyke's Salamander	Candidate
Western Toad	Candidate

Reptile Species	State Status
Pacific Pond Turtle (also known as Western Pond Turtle)	Endangered

Bird Species	State Status
Brandt's Cormorant	Candidate
Brown Pelican	
Common Loon	Sensitive
Common Murre	Candidate
Marbled Murrelet	Threatened
Short-tailed Albatross	Candidate
Tufted Puffin	Endangered
Western grebe	Candidate
W WA nonbreeding concentrations of: Loons, Grebes, Cormorants, Fulmar, Shearwaters, Storm-petrels, Alcids	
W WA breeding concentrations of: Cormorants, Storm-petrels, Terns, Alcids	
Great Blue Heron	
Brant	
Western Washington nonbreeding concentrations of: Barrow's Goldeneye, Common Goldeneye, Bufflehead	
Harlequin Duck	

Bird Species	State Status
Trumpeter Swan	
Waterfowl Concentrations	
Golden Eagle	Candidate
Northern Goshawk	Candidate
Mountain Quail	
Sooty Grouse	
Wild Turkey	
Snowy Plover	Endangered
W WA nonbreeding concentrations of: Charadriidae, Scolopacidae, Phalaropodidae "	
Band-tailed Pigeon	
Yellow-billed Cuckoo	Endangered
Spotted Owl	Endangered
Vaux's Swift	Candidate
Pileated Woodpecker	Candidate
Oregon Vesper Sparrow	Candidate
Purple Martin	Candidate
Streaked Horned Lark	Endangered

Mammal Species	State Status
Dall's Porpoise	
Blue Whale	Endangered
Humpback Whale	Endangered
Gray Whale	Sensitive
Sperm Whale	Endangered
Harbor Seal	
Orca (Killer Whale)	Endangered
Pacific Harbor Porpoise	Candidate
California Sea Lion	
Steller Sea Lion	
Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat	
Townsend's Big-eared Bat	Candidate
Keen's Myotis (formerly Keen's Long-eared Bat)	Candidate
Olympic Marmot	Candidate
Western Gray Squirrel	Threatened
Mazama (Western) Pocket Gopher	Threatened
Fisher	Endangered
Marten	
Columbian Black-tailed Deer	
Mountain Goat	
Elk	

Invertebrate Species	State Status
Butter Clam	
Native Littleneck Clam	
Manila Clam	
Olympia Oyster	Candidate
Pacific Oyster	
Razor Clam	
Dungeness Crab	
Pandalid shrimp (Pandalidae)	
Johnson's Hairstreak	Candidate
Mardon Skipper	Endangered
Queen Charlotte's Copper (formerly Makah Copper)	Candidate
Puget Blue	
Red Urchin	Candidate

The USFWS ECOS Environmental Conservation Online System reports the following species listed under the Endangered Species Act.[24] If any of these species are suspected to be on property, the Technical Provider should consult the recovery plan, if available, for appropriate management actions when developing Individual Stewardship Plans.

Amphibians	Status	Recovery Plan
Oregon spotted frog (Rana pretiosa)	Threatened	

Birds	Status	Recovery Plan
Short-tailed albatross (Phoebastria (=Diomedea) albatrus)	Endangered	Short-Tailed Albatross (Phoebastria albatrus) Final Recovery Plan
Brown pelican (Pelecanus occidentalis)	Recovery	
Yellow-billed cuckoo (Coccyzus americanus)	Threatened	
Western snowy plover (Charadrius nivosus nivosus)	Threatened	Final Recovery Plan for the Western Snowy Plover
Northern spotted owl (Strix occidentalis caurina)	Threatened	Revised Recovery Plan for the Northern Spotted Owl
Marbled murrelet (Brachyramphus marmoratus)	Threatened	Recovery Plan for the Threatened Marbled Murrelet
Streaked Horned lark (Eremophila alpestris strigata)	Threatened	

Freshwater Fishes	Status	Recovery Plan
Bull Trout (Salvelinus confluentus)	Threatened	Recovery Plan for the Coterminous United States Population of Bull Trout
Dolly Varden (Salvelinus malma)	Proposed Similarity of Appearance (Threatened)	

Flowering Plants	Status	Recovery Plan
Golden paintbrush (Castilleja levisecta)	Threatened	Final Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington & Recovery Plan for the Golden Paintbrush (Castilleja levisecta)
Water howellia (Howellia aquatilis)	Threatened	Water Howellia Recovery Plan, Public and Agency Review Draft

Insects	Status	Recovery Plan
Oregon silverspot butterfly (Speyeria zerene hippolyta)	Threatened	Office Revised Recovery Plan for the Oregon Silverspot Butterfly (Speyeria zerene hippolyta)

Mammals	Status	Recovery Plan
Olympia pocket gopher (Thomomys mazama pugetensis)	Threatened	
Tenino pocket gopher (Thomomys mazama tumuli)	Threatened	
Yelm pocket gopher (Thomomys mazama yelmensis)	Threatened	

Reptiles	Status	Recovery Plan
Leatherback sea turtle (Dermochelys coriacea)	Endangered	Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle

Snails	Status	Recovery Plan
Burrington jumping-slug	Under review	

Marine ESA listed species in Grays Harbor County identified by the West Coast Region of NOAA Fisheries that agricultural activities may impact include the following:

Species	Status	Recovery Plan
Green Sturgeon	Threatened	Draft Green Sturgeon Recovery Plan
Eulachon	Threatened	Endangered Species Act Recovery Plan for the Southern Distinct Population Segment of Eulachon (Thaleichthys pacificus)

Frequently Flooded Areas

Frequently flooded areas are "lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater. These areas include, but are not limited to, streams, rivers, lakes, coastal areas, wetlands, and areas where high groundwater forms ponds on the ground surface."[25]

Major flooding occurs frequently in some of the larger river valleys in the county, particularly along the Chehalis, Wynoochee, and Satsop Rivers. Flood plains cover extensive areas of agricultural lands within the county - an estimated 16,256 acres of commercial farmland.

Benefits. Floodplains aid agriculture over time by depositing sand, silt, and other soil forming materials on a valley floor. Overtime, these deposits provide fertile soil for agricultural production. They are also important in recharging wetlands and aquifers that store water essential for irrigation during dry periods.

Agricultural lands in flood plains also provide benefits to other land uses by accommodating large over-bank flows that reduce flooding risks that can affect downstream properties.

Risks. Flood plains can seriously endanger farm properties and operations by destroying crops, drowning livestock, and damaging structures. Requirements for flood insurance can hamper the purchase and reinvestment in farm properties, affecting the long-term viability of agriculture in the county.

Geologically Hazardous Areas

‘‘Geologically hazardous areas are areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suited to siting commercial, residential, or industrial development consistent with public health or safety concerns.

- "Erosion hazard areas" are those areas containing soils which, according to the United States Department of Agriculture Natural Resources Conservation Service Soil Survey Program, may experience significant erosion. Erosion hazard areas also include coastal erosion-prone areas and channel migration zones.
- "Landslide hazard areas" are areas at risk of mass movement due to a combination of geologic, topographic, and hydrologic factors
- "Seismic hazard areas" are areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement, soil liquefaction, debris flows, lahars, or tsunamis. [26]

Risks. Landslide risk is limited only to about 1,000 acres of farmland, mostly in the Lincoln and Wynoochee subbasins. Seismic risk potentially could affect 19,000 acres of farmland throughout the county.

Erosion hazard areas created by channel migration zones is significant concern for agriculture in the county. Channel migration zones are those areas along streams and rivers that the channel can reasonably expect to migrate over time. Migrating rivers and streams can erode large areas, resulting in costly losses of cropland, pasture, and structures. The stabilization of riverbanks through the restoration of riparian corridors can help reduce the likelihood of channel migration and severe erosion.

While channel migration is common along major rivers in Grays Harbor County, parcel level data is not readily available. The Department of Ecology in 2015 prepared a model showing channel migration in the county, but the results essentially mirror the 100-year floodplain. More general information is available through the county Comprehensive Flood Hazard Management Plan.

Tsunami is a danger to approximately 400 acres of farmland (mostly cranberry bogs) in the South Harbor and Humptulips subbasins. A severe tsunami could affect agricultural operations by destroying structures, depositing dangerous wastes from urban areas, and allowing salt intrusion into soil and water sources. A Washington Department of Natural Resources data layer enables pinpointing which agricultural areas will most likely be affected during a severe tsunami event.

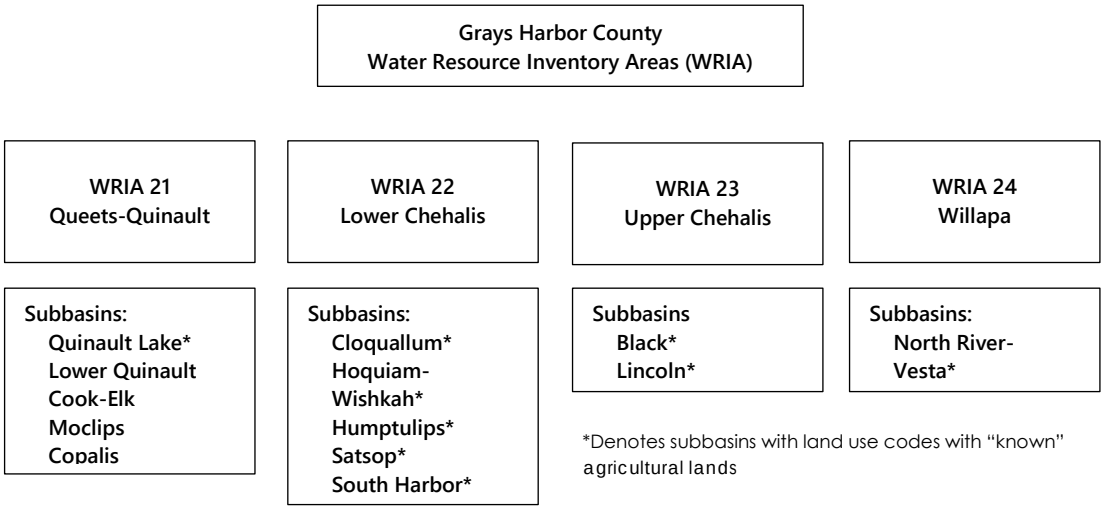
Section Four:

Watershed Subbasin Profiles

The Watershed Subbasin Profiles provide the Work Group with information about how critical areas intersect with agricultural lands within county Watershed Resource Inventory Areas (WRIA) and their respective subbasins. This level of detail allows the Work Group to formulate and pursue specific stewardship opportunities in those areas where they may be needed most.

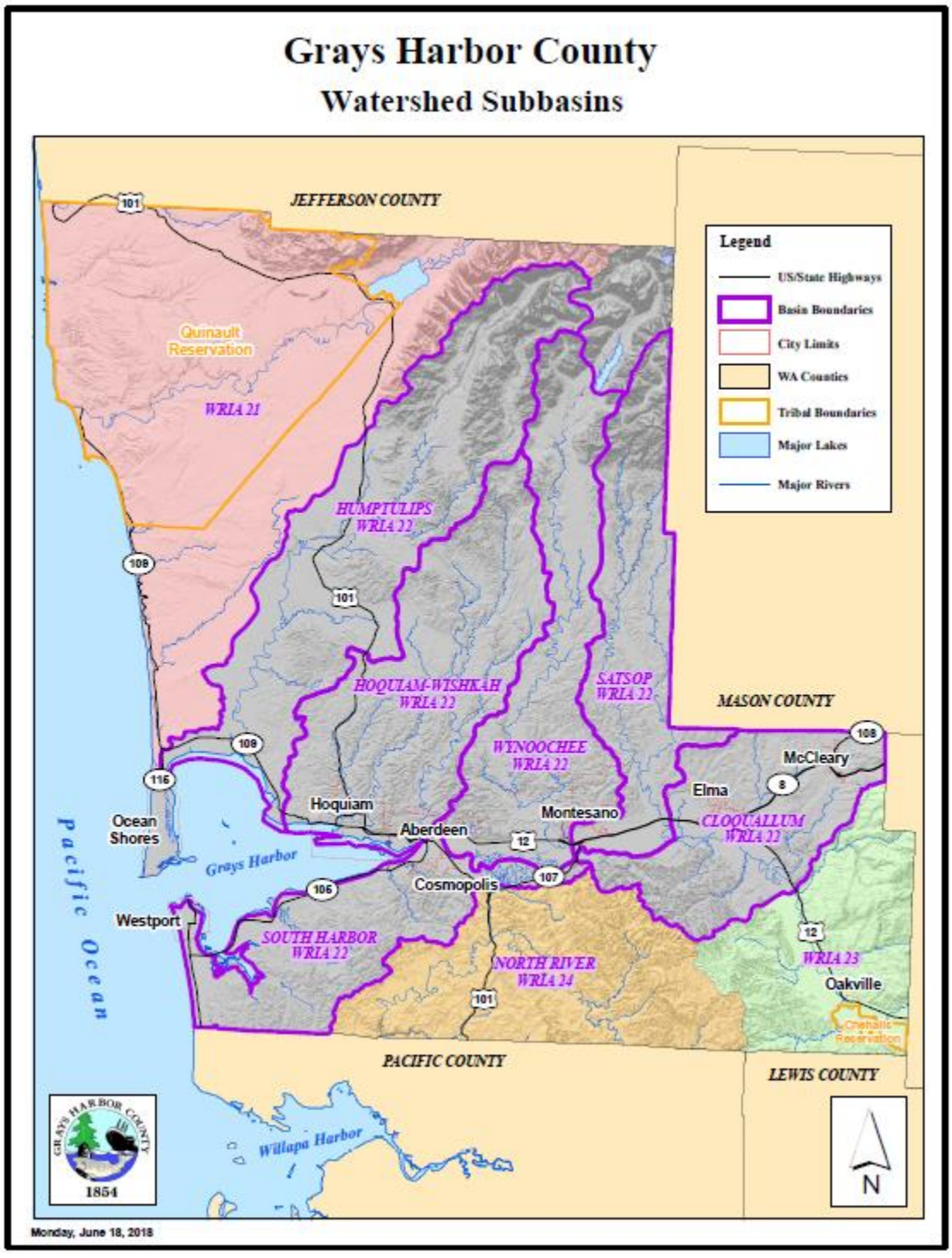
The State of Washington organizes the state's watersheds into 62 WRIAs.[27] A "watershed" is an area draining into a river, lake, or other waterbody. The purpose of establishing the WRIA system is to facilitate the planning and management of water resources in the state. Since the creation of the WRIA system, state agencies and local governments rely on these administrative boundaries to plan and manage a wide array of natural resources. This system has also lent itself to organizing data about critical areas.

There are four Watershed Resource Inventory Areas (WRIA) in Grays Harbor County: the Queets-Quinault (WRIA 21), the Lower Chehalis (WRIA 22), the Upper Chehalis (WRIA 23), and the Willapa (WRIA 24). Of these four WRIA, the Lower and Upper Chehalis (22 & 23) cover a very large, often diverse number of drainages. To aid in the ease of analyzing critical area conditions in the four WRIA, each one is further subdivided into subbasins.



Each subbasin profile examines wetlands, frequently flooded areas, aquifer recharge areas for potable water supply, geologically hazardous areas, and fish and wildlife habitat conservation areas that intersect potential and known agricultural properties.

Please note that the information provided about acreage under each critical area reflects the size of the parcel affected and not the size of the critical area.



Data and resources from the Grays Harbor County Geographic Information Systems (GIS) and the Grays Harbor Assessor's Office were instrumental in the application of the data sources to specific parcels affected by a critical data within a subbasin. Analysis in the profile was derived from the review of maps and spreadsheets prepared by GIS, along with plans and reports noted in this report.

The primary data layers used in developing the subbasin profiles are from the following sources:

Area and Watershed Administrative Units (WAU) boundaries:

- The boundaries of each WAU is from a data layer provided by the Washington State Department of Natural Resources, Forest Practices Division

Watershed descriptions:

- US Census Bureau, 2010
- Grays Harbor County Assessor's Office parcel data, November 2016 as applied by Grays Harbor GIS

Estimated agricultural acreage:

- Grays Harbor County Assessor's Office parcel data for Land Use Codes 82, 83, 84.96, 86.97, November 2016 as applied by Grays Harbor GIS

Number of property owners enrolled in Open Space:

- Count of identified property owners by name within subbasin, Grays Harbor County Assessor's Office parcel data for Land Use Codes 82, 83, 84.96, 86.97, November 2016 as applied by Grays Harbor GIS (note: property owners may own parcels in one or more subbasins)

Primary agricultural activities:

- Interactive Online Crop Location Map, Washington State Department of Agriculture
- Interactive Dairy Map, Washington State Department of Agriculture

Wetlands:

- US Fish and Wildlife Service, National Wetlands Inventory for Washington State

Frequently flooded areas:

- Federal Emergency Management Agency, Digital Flood Insurance Rate Map (DFIRM) Database, Grays Harbor, Washington

Aquifer recharge areas for potable water supply:

- US Geological Survey, Principal Aquifers of the 48 Conterminous United States, Hawaii, Puerto Rico, and the US Virgin Islands, Version 1.0

Geologically hazardous areas:

- Washington Department of Natural Resources, Division of Geology and Earth Resources, Hazard Mitigation Grant Program Liquefaction Susceptibility and Site Class Maps of Washington State by County, June 2010
- Washington Department of Natural Resources, Division of Geology and Earth Resources, Tsunami hazard map of the southern Washington coast--Modeled tsunami inundation from a Cascadia subduction zone earthquake, June 2010
- Washington State Department of Natural Resources, Division of Geology and Earth Resources, Landslide Compilation, November 2014

Fish and wildlife habitat conservation areas:

- Priority Habitats and Species (PHS on the Web), Washington Department of Fish and Wildlife
- Washington Department of Ecology, General 303(d) List Information, December 2016 (http://www.ecy.wa.gov/programs/wq/303d/index.html) – inventories streams on list that run through or adjacent agricultural properties; please note that the cause of this listing may not be linked to activities on individual properties but impacts caused further upstream

Please note. *It is important to note the limitations of the data in each profile is for general planning purposes only. All data presented in the profile should be considered advisory in nature and approximate in location and detail. Field inspection is necessary to determine the presence of critical areas on a site-specific basis.*

The Quinault Watershed (WRIA 21) is not included among the profile because of its extremely small number of farms and ranches.

WRIA 22 – Cloquallum Subbasin Profile

Area: 117,648 (184 square miles)

Major waterbodies: Chehalis River; Cloquallum, Eaton, Mox-Chehalis, Newman, Vance, McDonald, Fuller, Delezene, Workman, Wildcat Creeks; Wenzel Slough

Watershed description: Unincorporated population is 6,812 and includes rural communities of South Elma, Saginaw, Greenwood, Rony, and Malone. Cities include Elma (3,145) and McCleary (1,685). Land uses: agriculture (6.5%), forestry (78.3%), residential (11.4%), open space preservation (0.8%), all other (2.9%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 5,771 acres
- Number of property owners: 57

Predominant agricultural activities: Commercial nurseries, 2 dairies, Christmas trees, hay/silage, cereal grains, pasture

Wetlands:

- Acres on Current Use Open Space lands: 730 acres
- Number of property owners: 13

Frequently flooded areas:

- Acres on Current Use Open Space lands: 3,756 acres
- Number of property owners: 13

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: 64
- Acres on Current Use Open Space lands: 4,375 acres
- Number of property owners: 51

Geologically hazardous areas: Seismic hazard areas

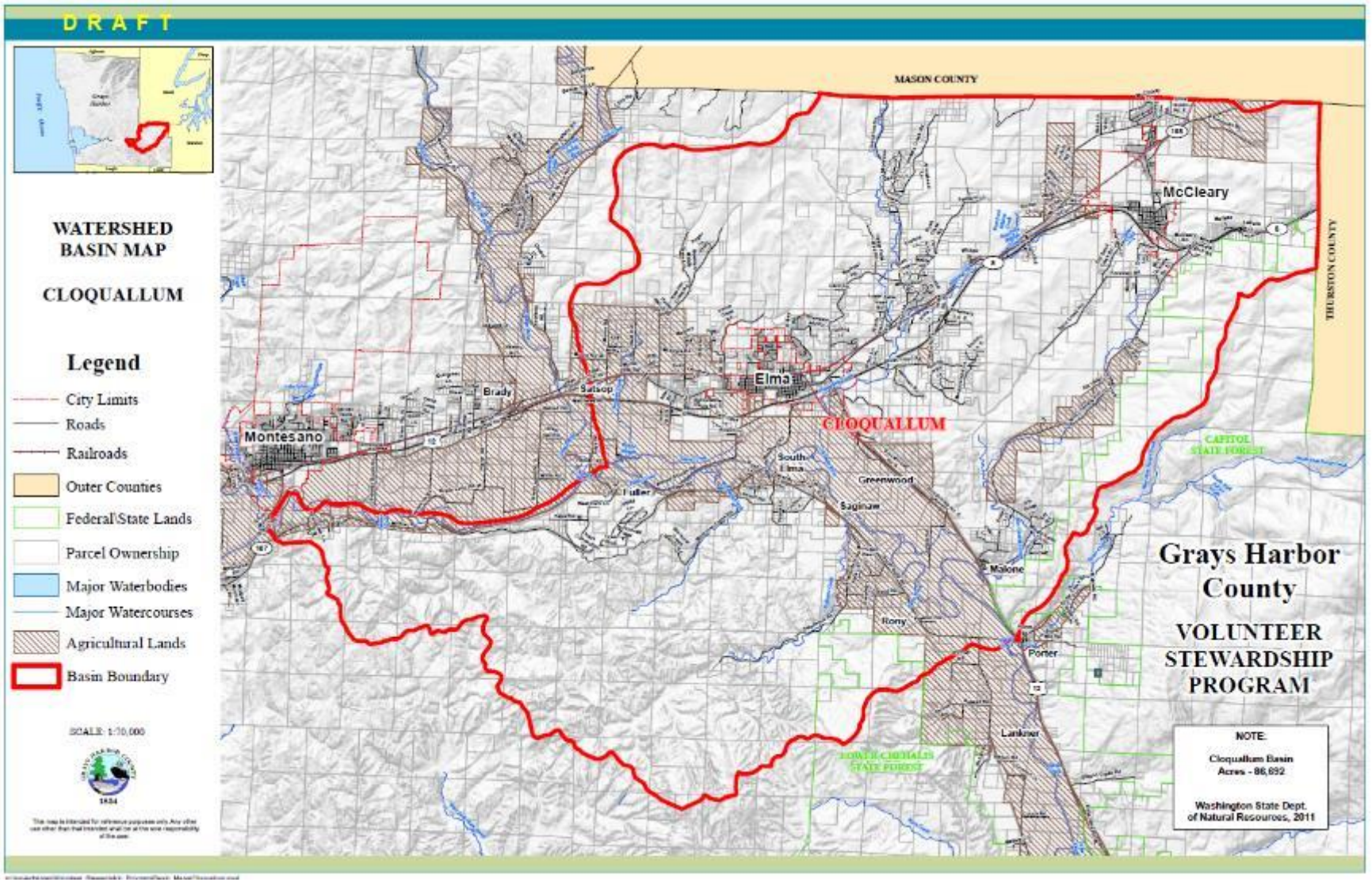
- Acres on Current Use Open Space lands: 5,617 acres
- Number of property owners: 54

Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 5,090 acres
- Number of property owners: 46
- Salmonid stocks and status:
  - Fall Chinook – healthy
  - Coho – healthy
  - Cutthroat – undetermined
  - Winter steelhead - healthy
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites, marbled murrelet, overwintering concentrations non-resident Canada geese, wood duck nesting/brood areas, shorebird concentration area, waterfowl wintering area, bald eagle nest/roost buffers, northern goshawk, osprey, trumpeter swans overwintering area,
  - Mammals: mink habitat,
  - Fish: Olympic mudminnow, bull trout, Chinook salmon, chum salmon, coho salmon, cutthroat trout, largemouth bass, mountain whitefish, steelhead trout
  - Other: western floater, western Pearlshell, western ridgemussel, western toad
- Water quality/quantity issues: The 303(d)water quality reports

Listing Id	Current Category	Waterbody	Parameter
77970	5	Chehalis	Dissolved oxygen
9474	5	Chehalis	Temperature
9952	1	Chehalis	Bacteria
77972	5	Cloquallum	Dissolved oxygen
73505	2	Cloquallum	Temperature
72494	1	Cloquallum	Bacteria
7739	4A	Wildcat Creek	Temperature
7740	4A	Wildcat Creek	Dissolved oxygen

  - The Mox Chehalis and Wildcat Creek are closed to further consumptive appropriation; an exception is made for domestic and normal stockwatering where there is no alternative source of water supply (WAC 173-522-050).


DRAFT
WATERSHED BASIN MAP
CLOQUALLUM
Legend
City Limits
Roads
Railroads
Outer Counties
Federal\State Lands
Parcel Ownership
Major Waterbodies
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:70,000
MASON COUNTY
THURSTON COUNTY
McCleary
Elma
Brady
Satsop
Montesano
CLOQUALLUM
South Elma
Greenwood
Fuller
Saginaw
Malone
Rony
Porter
Lanksaw
CAPITOL STATE FOREST
LOWER CHEHALIS STATE FOREST
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Cloquallum Basin
Acres - 86,692
Washington State Dept. of Natural Resources, 2011

WRIA 22 – Hoquiam-Wishkah Subbasin Profile

Area: 133,206.4 acres (208.1 square miles)

Major waterbodies: West Fork Hoquiam, North Fork Hoquiam, Middle Fork Hoquiam, and Little Hoquiam Rivers; Lytle, Hoover, Wyman, and Barnard Creeks; and Polson Slough.

Watershed description: Unincorporated population is 2,420 and includes the rural communities of Wishkah, Nisson, New London, Aberdeen Gardens, and Gray Harbor City. Cities include Aberdeen (16,780) and Hoquiam (8,580). Land uses: agriculture (0.2%), forestry (93.5%), residential (4.4%), open space preservation (1.2%), all other (0.8%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 270.3 acres
- Number of property owners: 8

Predominant agricultural activities: hay, livestock

Wetlands:

- Acres on Current Use Open Space lands: 24 acres
- Number of property owners: 1

Frequently flooded areas:

- Acres on Current Use Open Space lands: 24 acres
- Number of property owners: 7

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: 0
- Number of acres in Current Use Open Space: 270.3 acres
- Number of property owners: 8

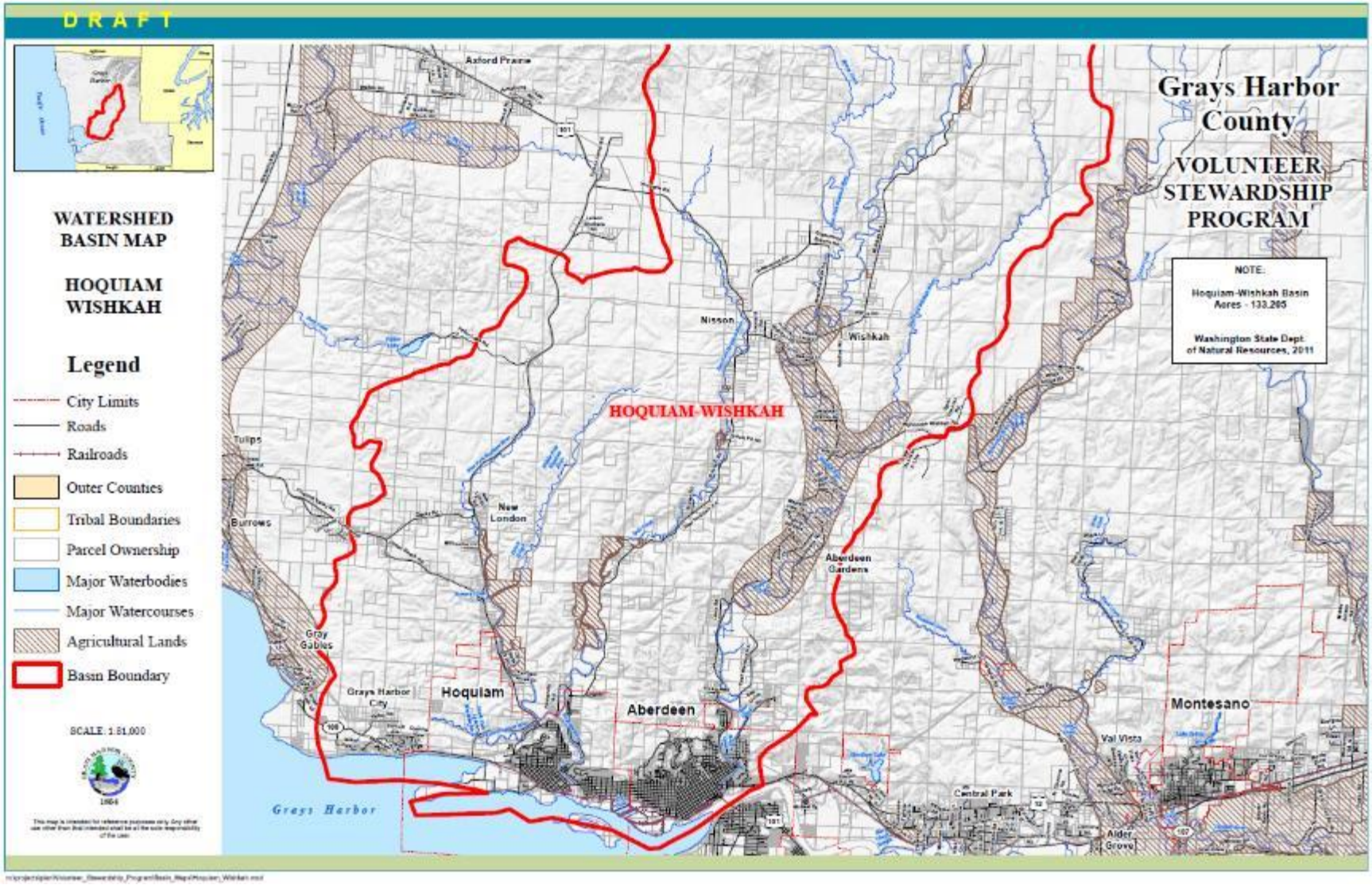
Geologically hazardous areas: Seismic hazard areas

- Acres on Current Use Open Space lands: 91.4 acres
- Number of property owners: 4

Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 0.0 acres
- Number of property owners: 0
- Salmonid stocks and status:
  - Fall Chinook – depressed (Hoquiam), healthy (Wishkah)
  - Coho – healthy (Hoquiam), depressed (Wishkah)
  - Chum – healthy
  - Cutthroat – unknown
  - Winter steelhead – depressed (Hoquiam), healthy (Wishkah)
  - Bull trout – critical habitat (Wishkah)
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites; great blue heron rookery; marbled murrelet; tidal wetland waterfowl concentrations; shorebird concentration area; wood ducks; peregrine falcon wintering areas; purple martins; bald eagle nest/roost buffers; eastern wild turkey; gyrfalcon; northern goshawk; osprey; peregrine falcon; purple martin;
  - Mammals:
  - Fish: bull trout; Chinook salmon; chum salmon; coho salmon; cutthroat trout; largemouth bass; steelhead trout; Olympic mudminnow; reticulate sculpin; riffle sculpin
  - Other: Cope's giant salamander; Olympic torrent salamander; tailed frog
  - Habitat: national wildlife refuge; coastal salt marshes; salt meadows; brackish marshes; Wynoochee mitigation units 1-4;
- Water quality/quantity issues: The 303(d)water quality reports for the Humptulips River within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
77764	2	Wishkah River	Dissolved oxygen
8000	4A	Wishkah River	Bacteria
8002	1	Wishkah River	Bacteria
9955	1	EF Hoquiam River	Bacteria
14866	2	Wishkah River	Temperature


DRAFT
WATERSHED BASIN MAP
HOQUIAM WISHKAH
Legend
City Limits
Roads
Railroads
Outer Counties
Tribal Boundaries
Parcel Ownership
Major Waterbodies
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE 1:81,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Hoquiam-Wishkah Basin
Acres - 133,265
Washington State Dept. of Natural Resources, 2011
HOQUIAM-WISHKAH
Axford Prairie
Nisson
Wishkah
Tulips
Burrows
New London
Aberdeen Gardens
Gray Gables
Grays Harbor City
Hoquiam
Aberdeen
Montesano
Val Vista
Central Park
Alder Grove
Grays Harbor

WRIA 22 - Humptulips Subbasin Profile

Area: 178,118 acres (278 square miles)

Major waterbodies: Humptulips, EF Humptulips, WF Humptulips Rivers; Chenois, Deep, and Stevens Creeks; Campbell and Gillis Sloughs.

Watershed description: Unincorporated population is 1,454 and includes the rural communities of Humptulips, Axford Prairie, Tulips, Newton, Burrows, and Gray Gables. Land uses: agriculture (0.2%), forestry (94.8%), residential (4.3%), open space preservation (0.3%), all other (0.4%).

Estimated agricultural acreage: This subbasin has the one of the smallest percentages of farm and agricultural land under open space taxation, with cranberry production comprising the largest share. Most agricultural activities lie within the valley close to the Humptulips River and a few tributaries.

- Acres enrolled in Current Use Open Space: 429.3 acres
- Number of property owners: 13

Predominant agricultural activities: Pasture, hay, cranberries, shellfish, livestock

Wetlands:

- Acres on Current Use Open Space lands: 3 acres
- Number of property owners: 7

Frequently flooded areas: Large areas of agricultural land within the Humptulips Valley are within the 100-year floodplain.

- Acres on Current Use Open Space lands: 67 acres
- Number of property owners: 10

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: 0
- Acres on Current Use Open Space lands: 234.2 acres
- Number of property owners: 13

Geologically hazardous areas: Tsunami hazard areas

- Acres on Current Use Open Space lands: 40.3 acres
- Number of property owners: 4

Geologically hazardous areas: Seismic hazard areas

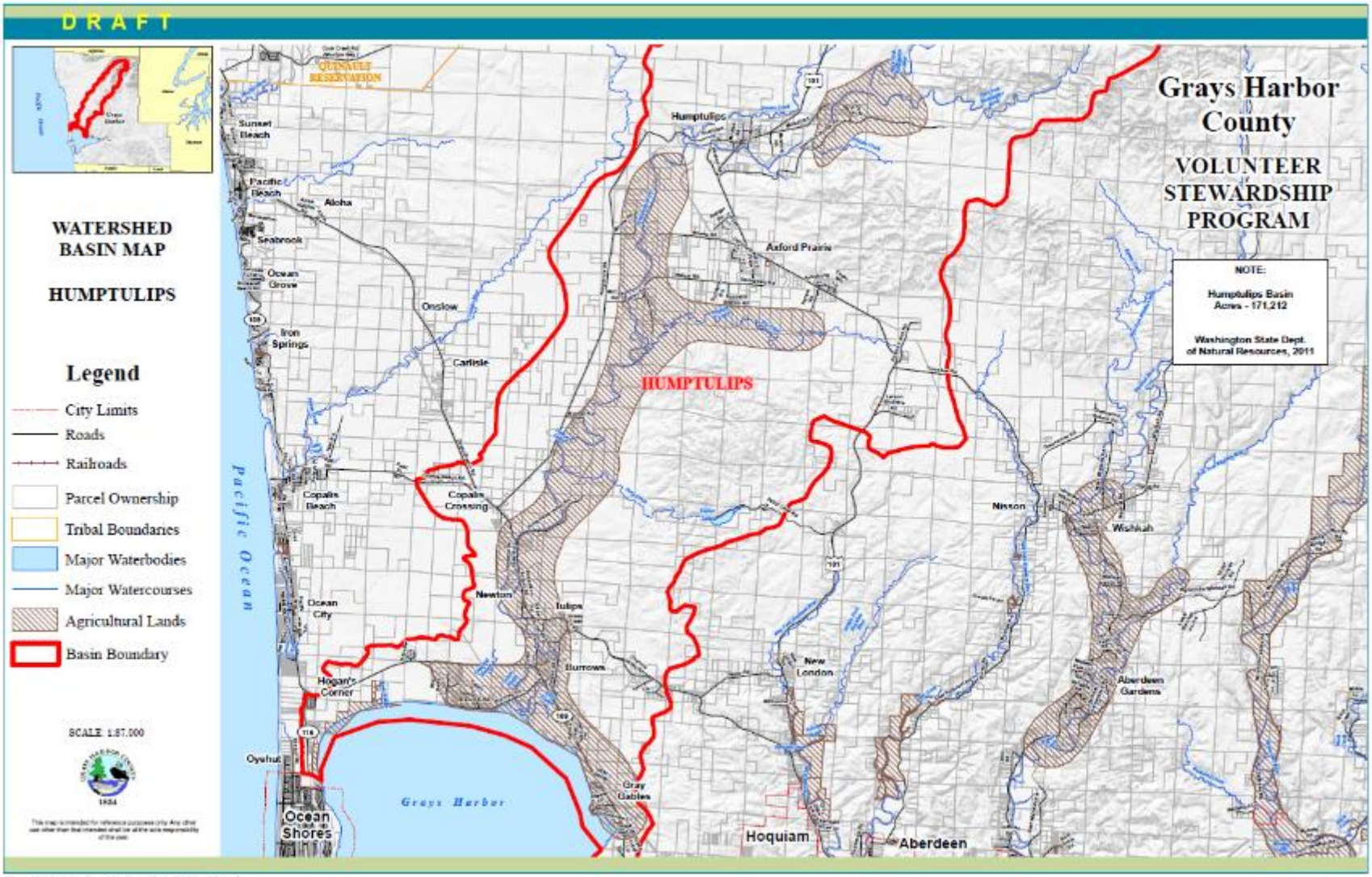
- Number of acres in Current Use Open Space: 234 acres
- Number of property owners: 11

Fish and wildlife habitat conservation areas: Freshwater forested/shrub and emergent wetlands are the main priority habitats in the

- Acres on Current Use Open Space lands: 40.33 acres
- Number of property owners: 6
- Salmonid stocks and status:
  - Fall Chinook – depressed
  - Coho – healthy
  - Chum – healthy
  - Cutthroat – unknown
  - Winter steelhead – depressed
  - Summer steelhead – unknown
  - Bull trout – critical habitat
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites; great blue heron colony; bald eagle winter concentration area; Vaux's swift; marbled murrelet; tidal wetland waterfowl concentrations; paired wood ducks; shorebird concentration areas; trumpeter swan wintering area, peregrine falcon wintering areas; bald eagle nest/roost buffers; northern goshawk; osprey;
  - Mammals: mink habitat; Townsend's big-eared bat;
  - Fish: Chinook salmon; chum salmon; coho salmon; cutthroat trout; rainbow trout; steelhead trout; bull trout; Olympic mudminnow; reticulate sculpin;
  - Other: cope's giant salamander; Olympic torrent salamander; tailed frog; Van Dyke's salamander; and western toad
  - Habitat: coastal salt marshes; salt meadows; brackish marshes;

- Water quality/quantity issues: The 303(d)water quality reports for the Humptulips River within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
77978	5	Humptulips River	Dissolved oxygen
73513	1	Humptulips River	Temperature
9482	4A	Humptulips River	Temperature
77766	2	Humptulips River	Dissolved oxygen
9958	4A	Grass Creek	Bacteria
9480	2	Grass Creek	Temperature
9953	4A	Chenois Creek	Bacteria
9475	2	Chenois Creek	Temperature


DRAFT
WATERSHED BASIN MAP
HUMPTULIPS
Legend
City Limits
Roads
Railroads
Parcel Ownership
Tribal Boundaries
Major Waterbodies
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE 1:87,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Humptulips Basin Acres - 171,212
Washington State Dept. of Natural Resources, 2011
HUMPTULIPS
Pacific Ocean
Grays Harbor
Quinault Reservation
Sunset Beach
Pacific Beach
Aloha
Seabrook
Ocean Grove
Iron Springs
Onslow
Carlisle
Copalis Beach
Copalis Crossing
Ocean City
Hogan's Corner
Oyehut
Ocean Shores
Newton
Tulips
Burrows
Gray Gables
Humptulips
Axford Prairie
Nixon
Wishkah
New London
Aberdeen Gardens
Hoquiam
Aberdeen

WRIA 22 – Satsop Subbasin Profile

Area: 163,745.7 acres (255.9 square miles)

Major waterbodies: Chehalis, Satsop, West Fork Satsop, East Fork Satsop, and Middle Fork Satsop Rivers; Still, Smith, Harstad, Stevens, Elizabeth and Cook Creeks

Watershed description: Unincorporated population is 2,320 and includes the rural communities of Brady and Satsop. The City of Montesano has an urban population of 4,105. Land uses: agriculture (7.9%), forestry (86.8%), residential (4.8%), open space preservation (0.3%), all other (0.2%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 6,448 acres
- Number of property owners: 58

Predominant agricultural activities: hay/silage, cereal grains, vegetables, flower bulbs, Christmas trees

Wetlands:

- Acre Acres on Current Use Open Space lands: 688 acres
- Number of property owners: 14

Frequently flooded areas:

- Acres on Current Use Open Space lands: 4,846 acres
- Number of property owners: 41

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: 210
- Number of acres in Current Use Open Space: 5,483 acres
- Number of property owners: 48

Geologically hazardous areas: Seismic hazard areas

- Acres on Current Use Open Space lands: 6,269 acres
- Number of property owners: 55
    - FEMA has designated the river north of Highway 12 as a channel migration zone. Documented severe bank erosion and channel migration has affected lower Satsop Valley property owners.

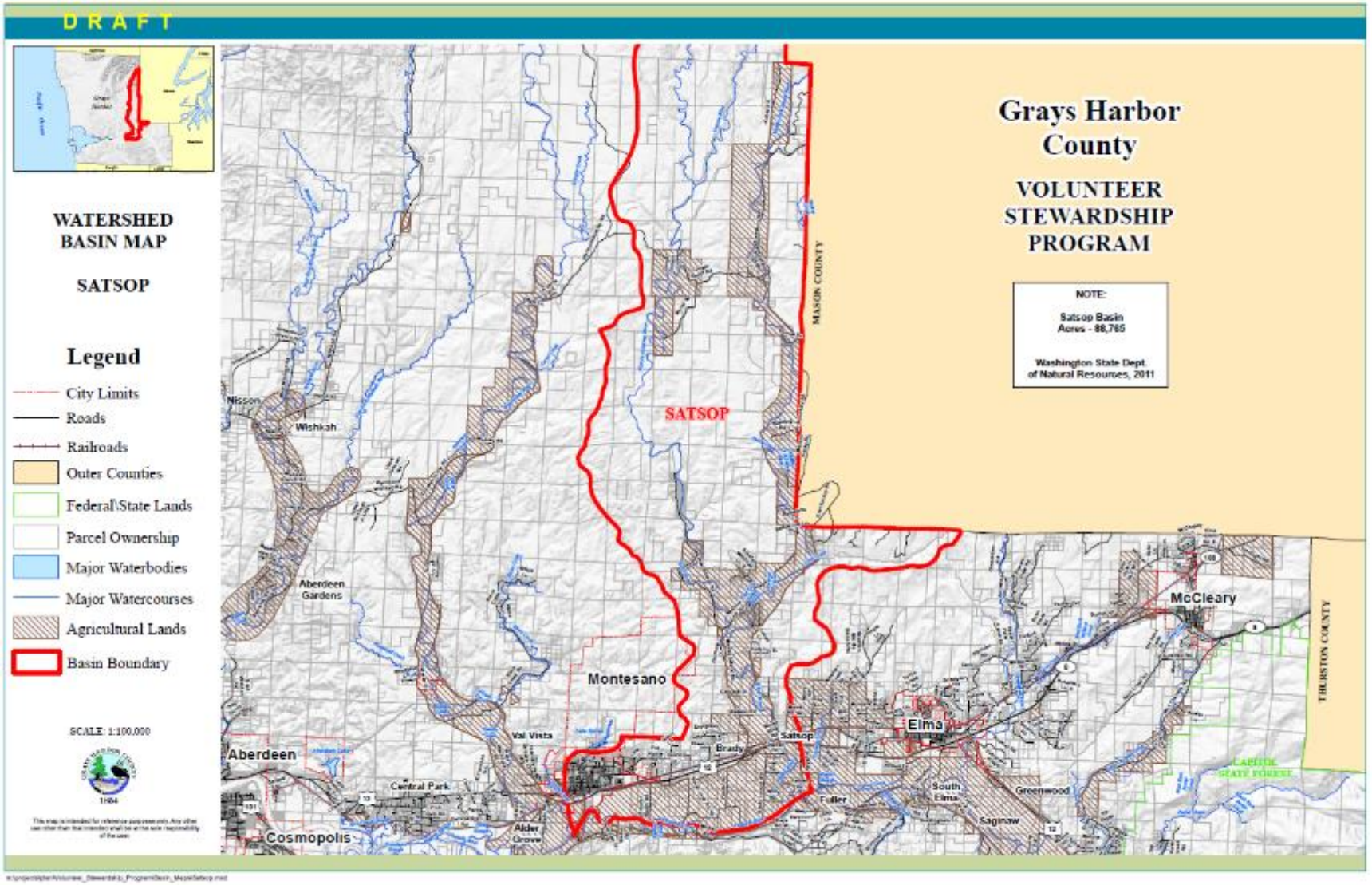
Fish and wildlife habitat conservation areas:

- Number of acres in Current Use Open Space: 4,837
- Number of property owners: 40
- Salmonid stocks and status:
  - Fall Chinook – healthy
  - Summer Chinook - depressed
  - Coho – healthy
  - Chum – healthy
  - Cutthroat – unknown
  - Winter steelhead – depressed
  - Summer steelhead – unknown
  - Bull trout – critical habitat
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites, great blue heron rookery, turkey vultures, marbled murrelet, trumpeter swans overwintering area, dusky Canada geese overwintering concentrations, paired wood duck, waterfowl wintering area, bald eagle nest/roost buffers, common loon, osprey
  - Mammals: mink habitat, fisher, Townsend's big-eared bat
  - Fish: chinook salmon, chum salmon, coho salmon, cutthroat trout, largemouth bass, rainbow trout, steelhead trout, bull trout, Olympic mudminnow, reticulate sculpin, riffle sculpin
  - Other: cope's giant salamander, tailed frog, Van Dyke's salamander, western toad
  - Habitat: oak woodland (Oregon white oak), clay & sandstone cliffs
- Water quality/quantity issues: The 303(d)water quality reports for the subbasin within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
52651	5	Chehalis	Polychlorinated Biphenyls (PCBs)
52594	5	Chehalis	Mercury
51599	2	Chehalis	2,3,7,8-TCDD TEQ
51897	1	Chehalis	Alpha-BHC
75743	1	Chehalis	Hexachlorocyclohexane (Lindane)
52775	1	Chehalis	Toxaphene

Listing Id	Current Category	Waterbody	Parameter
52412	1	Chehalis	Heptachlor
52351	1	Chehalis	Hexachlorocyclohexane (Lindane)
51776	1	Chehalis	4,4'-DDT
77281	1	Chehalis	Endosulfan
51958	1	Chehalis	Beta-BHC
51654	1	Chehalis	4,4'-DDD
52533	1	Chehalis	Hexachlorobenzene
51546	1	Chehalis	2,3,7,8-TCDD (Dioxin)
52714	1	Chehalis	Total Chlordane
52019	1	Chehalis	Dieldrin
52291	1	Chehalis	Endrin Aldehyde
51715	1	Chehalis	4,4'-DDE
51836	1	Chehalis	Aldrin
77015	1	Chehalis	Chlordane
52473	1	Chehalis	Heptachlor Epoxide
52231	1	Chehalis	Endrin
23799	1	Satsop	Bacteria
8038	5	Satsop	Dissolved oxygen
16749	1	Satsop	Bacteria
23801	1	Satsop	Bacteria
77975	5	WF Satsop	Dissolved oxygen
73508	2	WF Satsop	Temperature
72261	1	WF Satsop	Bacteria
23803	1	Satsop	Bacteria
23805	1	Satsop	Bacteria
77974	5	MF Satsop	Dissolved oxygen
73506	2	MF Satsop	Temperature
23806	1	MF Satsop	Bacteria
23807	1	MF Satsop	Bacteria

- Water flows are generally low during the summer, impacting fish habitat. Disconnection of the floodplain from the river by roads and channel incision has reduced storage capacity in the valleys.


DRAFT
WATERSHED BASIN MAP
SATSOP
Legend
City Limits
Roads
Railroads
Outer Counties
Federal\State Lands
Parcel Ownership
Major Waterbodies
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:100,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Satsop Basin Acres - 88,765
Washington State Dept. of Natural Resources, 2011
SATSOP
MASON COUNTY
THURSTON COUNTY
Nisson
Wishkah
Aberdeen Gardens
Montesano
Aberdeen
Cosmopolis
Central Park
Alder Grove
Val Vista
Brady
Satsop
Elma
McCleary
South Elma
Greenwood
Fuller
Sagrow
CAPITOL STATE FOREST

WRIA 22 – South Harbor Subbasin Profile

Area: 49,051 (77 square miles)

Major waterbodies: Chehalis, Johns, and Elk Rivers; Blue and Preachers Slough

Watershed description: Unincorporated population is 4,678 and includes the rural communities of Grayland, Bay City, Ocosta, Markham, and Melbourne. The City of Cosmopolis (1,650) is the only incorporated municipality. Land uses: agriculture (1.0%), forestry (92.9%), residential (3.3%), open space preservation (0.1%), all other (2.1%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 401 acres
- Number of property owners: 26

Predominant agricultural activities: Cranberry production and processing, shellfish, hay/silage, pasture

Wetlands:

- Acres on Current Use Open Space lands: 15 acres
- Number of property owners: 20

Frequently flooded areas:

- Acres on Current Use Open Space lands: 11 acres
- Number of property owners: 20

Critical aquifer recharge areas:

- Number of acres of wellhead protection areas on Current Use Open Space: 2
- Acres on Current Use Open Space lands: 401 acres
- Number of property owners: 26

Geologically hazardous areas: Tsunami hazard areas

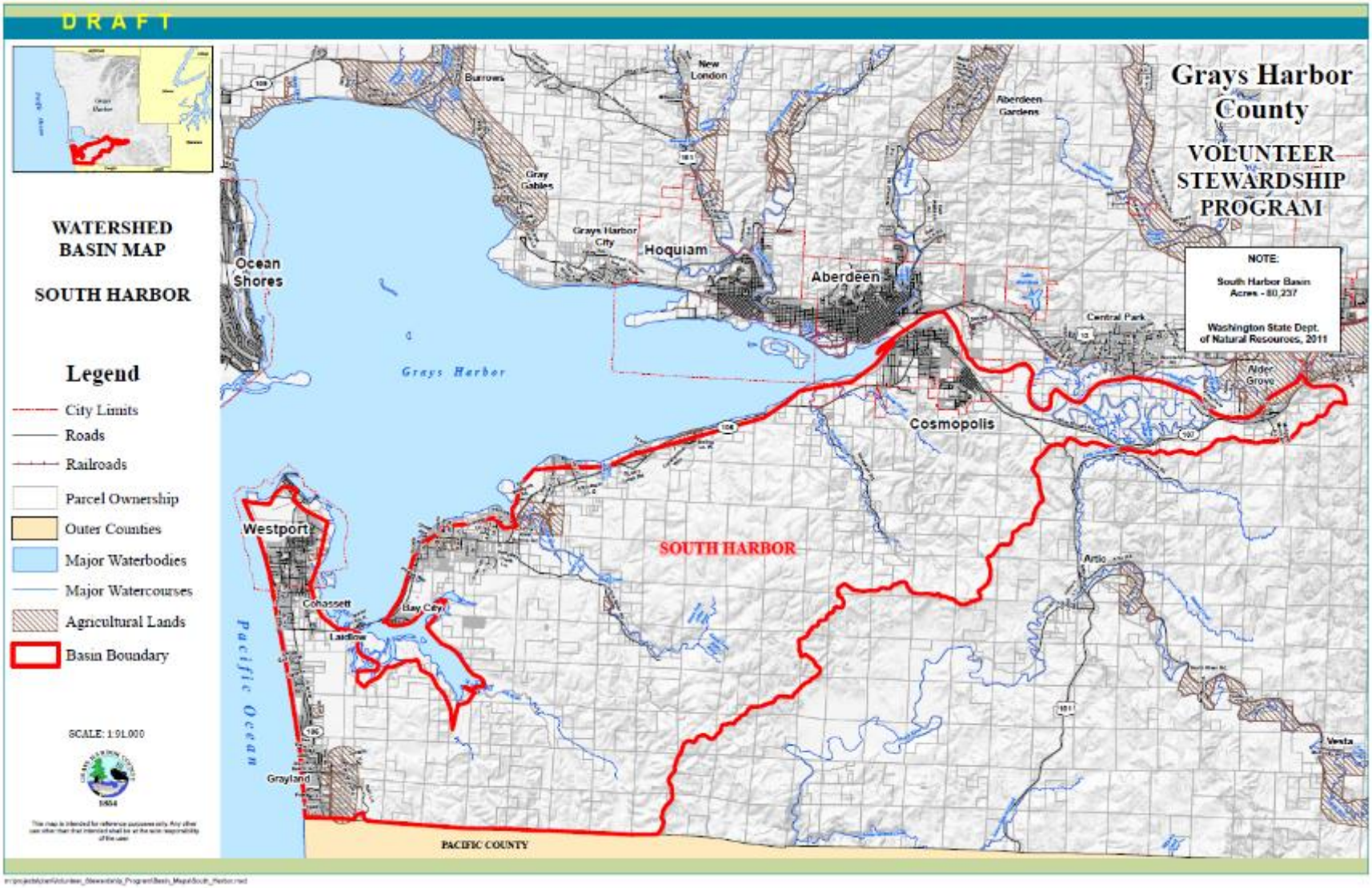
- Acres on Current Use Open Space lands: 365 acres
- Number of property owners: 26

Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 106 acres
- Number of property owners: 6

- Salmonid stocks and status:
  - Fall Chinook – healthy
  - Coho – healthy
  - Chum – healthy
  - Cutthroat – unknown
  - Winter steelhead – unknown
- Priority habitats and species in the subbasin:
  - Birds: great blue heron colony, great blue heron rookery, marbled murrelet, ban-tailed pigeon, shorebird concentration area, tidal wetlands waterfowl concentrations, wood duck breeding/nesting, dunlin, sanderling, blackbellied plover, western sandpiper, shortbilled dowitcher, bald eagle nest/roost buffers, snowy owl
  - Mammals: mink habitat,
  - Fish: pacific herring spawning areas, bull trout, chinook salmon, chum salmon, coho salmon, cutthroat trout, largemouth bass, steelhead trout, surf smelt spawning habitat, reticulate sculpin,
  - Other: Pacific oyster, razor clam
  - Habitat: coastal salt marshes, salt meadows, brackish marshes, waterfowl & shorebird concentration area, bluffs with snags & leave trees (habitat to diverse wildlife species, swan wintering area, peregrine falcon wintering areas, waterfowl wintering area, Johns River/Elk River crucial winter range,
- Water quality/quantity issues: The 303(d)water quality reports for the subbasin within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
40568	5	GH County Ditch No. 1	Chlorpyrifos
40570	5	GH County Ditch No. 1	4,4'-DDD
73521	2	GH County Ditch No. 1	Temperature
40569	2	GH County Ditch No. 1	4,4'-DDE
12851	5	GH County Ditch No. 1	4,4'-DDE
14171	5	GH County Ditch No. 1	Chlorpyrifos
12861	5	GH County Ditch No. 1	4,4'-DDD
12531	5	GH County Ditch No. 1	Water column bioassay
77979	5	GH County Ditch No. 1	Dissolved oxygen
8736	5	GH County Ditch No. 1	Diazinon
12775	5	GH County Ditch No. 1	Carbaryl


DRAFT
WATERSHED BASIN MAP
SOUTH HARBOR
Legend
City Limits
Roads
Railroads
Parcel Ownership
Outer Counties
Major Waterbodies
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:91,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
South Harbor Basin Acres - 80,237
Washington State Dept. of Natural Resources, 2011
Burrows
New London
Aberdeen Gardens
Gray Gables
Grays Harbor City
Hoquiam
Ocean Shores
Aberdeen
Central Park
Grays Harbor
Cosmopolis
Westport
SOUTH HARBOR
Cohassett
Bay City
Ladiow
Pacific Ocean
Grayland
Artic
Venta
PACIFIC COUNTY

WRIA 22 – Wynoochee Subbasin Profile

Area: 139,602 acres (218.1 square miles)

Major waterbodies: Chehalis and Wynoochee Rivers; Helm, Wedekind, Sylvia, Geisler, Caldwell, Mooney, and Black Creeks.

Watershed description: Unincorporated population is 5,019 that includes the rural community of Central Park (2,685). Land uses: agriculture (2.5%), forestry (91.5%), residential (4.4%), open space preservation (0.3%), all other (1.3%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 2,335.3 acres
- Number of property owners: 33

Predominant agricultural activities: hay/silage, pasture, vegetables, cereal grains

Wetlands:

- Acres on Current Use Open Space lands: 411 acres
- Number of property owners: 8

Frequently flooded areas:

- Acres on Current Use Open Space lands: 1,920 acres
- Number of property owners: 28

Critical aquifer recharge areas:

- Acres on Current Use Open Space lands: 61
- Number of acres in Current Use Open Space: 1,597.7 acres
- Number of property owners: 24

Geologically hazardous areas: Landslide hazard areas

- Acres on Current Use Open Space lands: 405.6 acres
- Number of property owners: 3

Geologically hazardous areas: Seismic hazard areas

- Acres on Current Use Open Space lands: 2,312 acres
- Number of property owners: 31

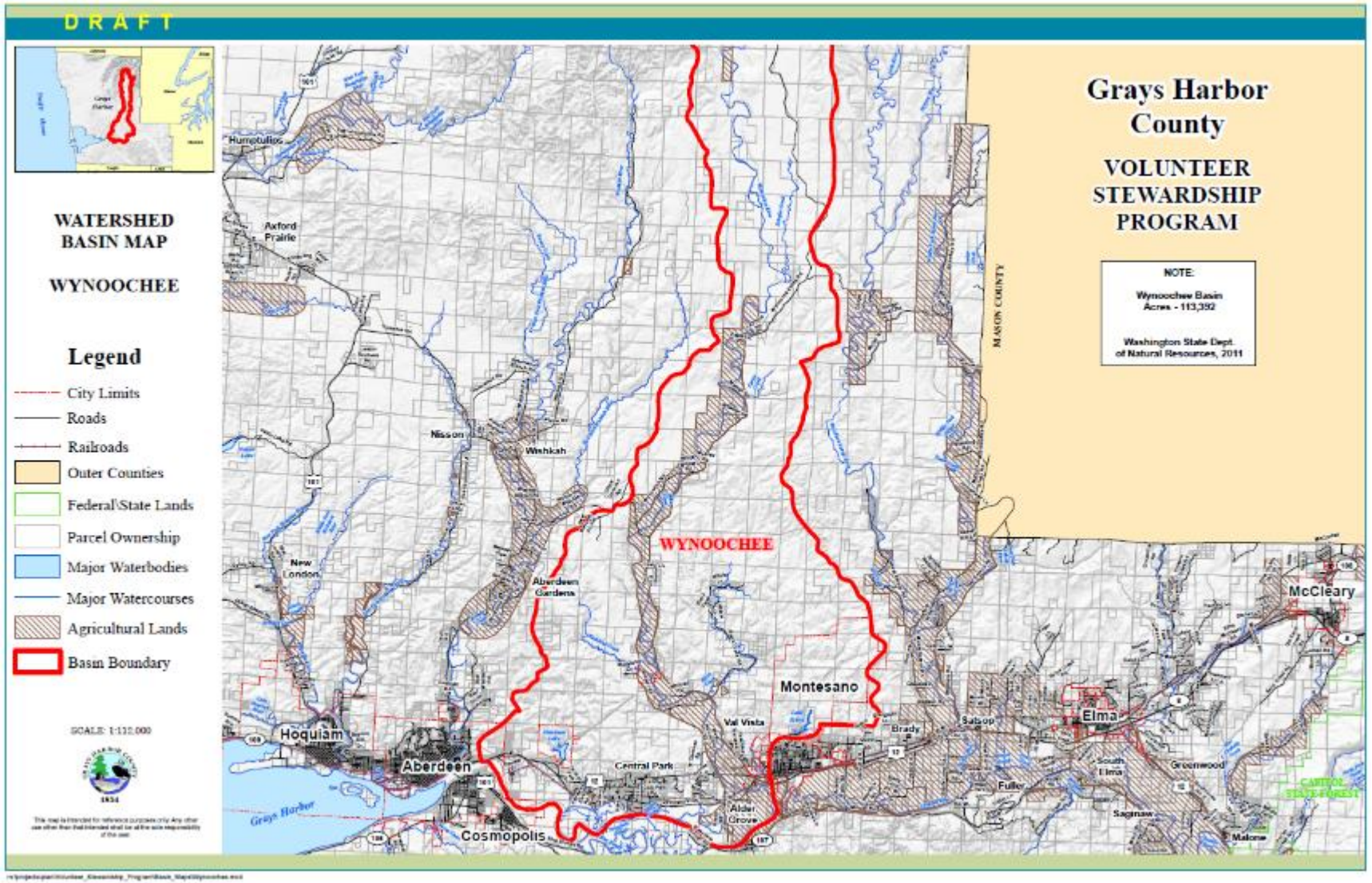
Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 1,801.2 acres
- Number of property owners: 24
- Salmonid stocks and status:
  - Fall Chinook – depressed
  - Coho – healthy
  - Chum – healthy
  - Cutthroat – unknown
  - Winter steelhead – healthy
  - Summer steelhead – unknown
  - Bull trout – critical habitat
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites, marbled murrelet, band-tailed pigeon, wood duck nesting/breeding, harlequin breeding areas, peregrine falcon wintering areas, waterfowl wintering areas, bald eagle nest/roost buffers, eastern wild turkey, mountain quail, northern goshawk, osprey,
  - Mammals: marten, Townsend's big-eared bat
  - Fish: Olympic mudminnow, bull trout, Chinook salmon, chum salmon, coho salmon, cutthroat trout, largemouth bass, steelhead trout, pacific lamprey, reticulate sculpin, riffle sculpin,
  - Other: Cope's giant salamander, Olympic torrent salamander, tailed frog, western toad
  - Habitat: clay & sandstone cliffs, Wynoochee mitigation units, Wynoochee river crucial winter range,
- Water quality/quantity issues: The 303(d)water quality reports for the subbasin within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
77757	2	Chehalis	Dissolved oxygen
9473	2	Chehalis	Temperature
9951	1	Chehalis	Bacteria
23815	1	Wynoochee	Bacteria
77976	5	Wynoochee	Dissolved oxygen
73509	2	Wynoochee	Temperature

Listing Id	Current Category	Waterbody	Parameter
23817	1	Wynoochee	Bacteria
77762	2	Wynoochee	Dissolved oxygen
73510	2	Wynoochee	Temperature
23818	1	Wynoochee	Bacteria
23819	1	Wynoochee	Bacteria

- The Wynoochee River is closed to further consumptive appropriation; an exception is made for domestic and normal stockwatering where there is no alternative source of water supply (WAC 173-522-050).


DRAFT
WATERSHED BASIN MAP
WYNOOCHEE
Legend
City Limits
Roads
Railroads
Outer Counties
Federal\State Lands
Parcel Ownership
Major Waterbodies
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:132,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Wynoochee Basin Acres - 113,352
Washington State Dept. of Natural Resources, 2011
MASON COUNTY
WYNOOCHEE
Humptulips
Axford Prairie
Nisson
Wishkah
New London
Aberdeen Gardens
Hoquiam
Aberdeen
Cosmopolis
Grays Harbor
Central Park
Val Vista
Alder Grove
Montesano
Brady
Satsop
Elma
South Elma
Fuller
Saginaw
Greenwood
Malone
McCleary
CAPITOL STATE FOREST

WRIA 23 – Black River Subbasin Profile

Area: 154,921 (242 square miles)

Major waterbodies: Black River; Porter, Cedar, Gibson

Watershed description: The unincorporated area has a rural population of 972. The City of Oakville is the only city with a population of 695. Land uses: agriculture (4.8%), forestry (90.7%), residential (4.8%), open space preservation (0.5%), all other (0.3%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 1,858 acres
- Number of property owners: 24

Predominant agricultural activities: 2 dairies, hay/silage, pasture

Wetlands:

- Acres on Current Use Open Space lands: 128 acres
- Number of property owners: 3

Frequently flooded areas:

- Acres on Current Use Open Space lands: 1,565 acres
- Number of property owners: 23

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: .01
- Acres on Current Use Open Space lands: 946 acres
- Number of property owners: 12

Geologically hazardous areas: Seismic hazard areas

- Acres on Current Use Open Space lands: 1,773 acres
- Number of property owners: 21

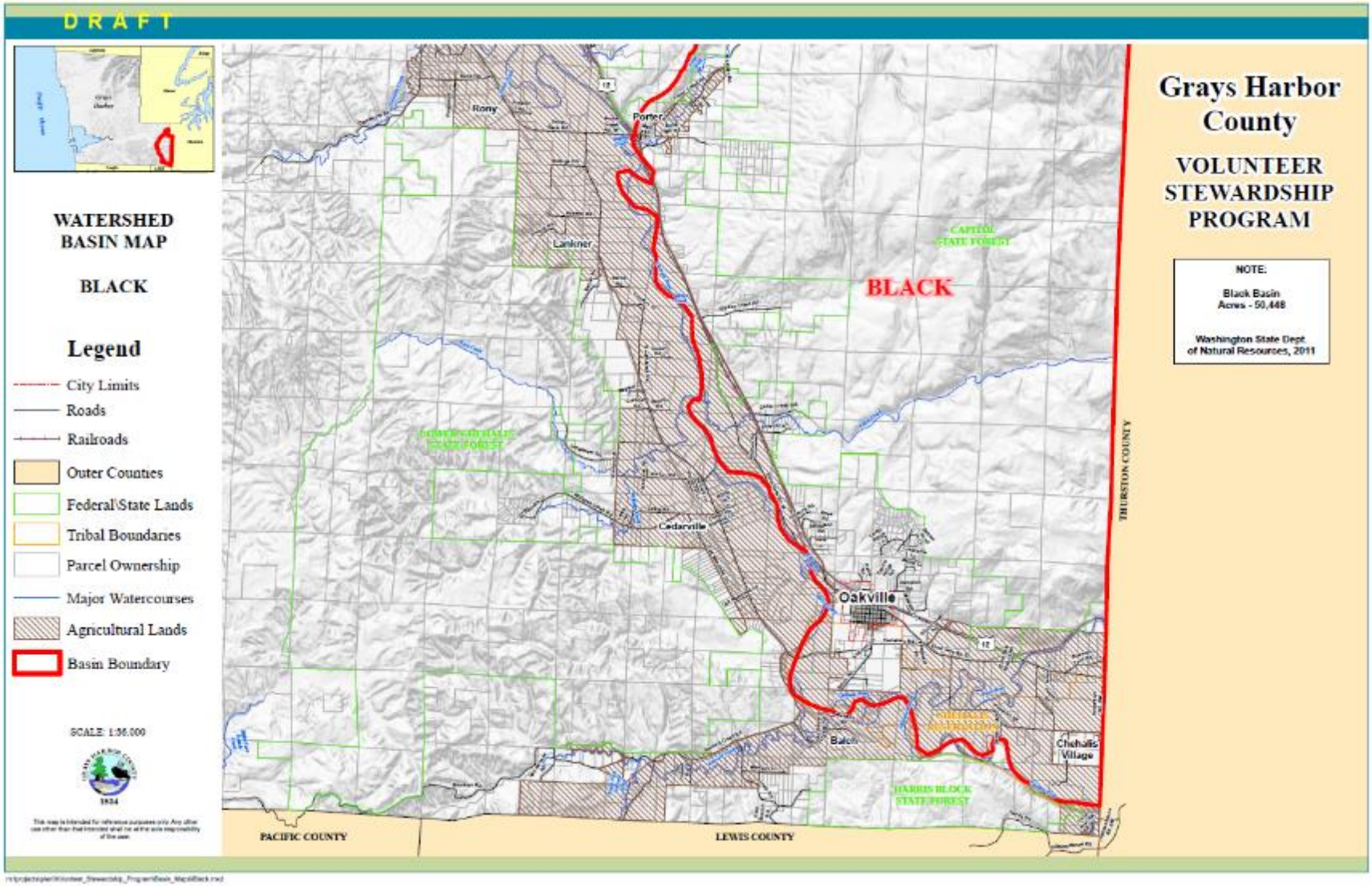
Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 1,166 acres
- Number of property owners: 17

- Salmonid stocks and status:
  - Fall Chinook – healthy
  - Coho – healthy
  - Chum – healthy
  - Cutthroat – unknown
  - Winter steelhead – depressed
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites, great blue heron colony, marbled murrelet, trumpeter swan overwintering area, waterfowl wintering area, wood duck nesting/brood/foraging areas, harlequin breeding areas, bald eagle nest/roost buffer, osprey
  - Mammals: Roosevelt elk, Townsend's big-eared bat
  - Fish: bull trout, Chinook salmon, chum salmon, coho salmon, cutthroat trout, largemouth bass, mountain whitefish, rainbow trout, steelhead trout, Olympic mudminnow, pacific lamprey, reticulate sculpin, riffle sculpin
  - Other: tailed frog, western pearlshell, western ridgemussel
  - Habitat: south bank crucial winter range,
- Water quality/quantity issues: The 303(d)water quality reports for the subbasin within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
77755	2	Porter Creek	Dissolved oxygen
10398	1	Porter Creek	Bacteria
77754	2	Cedar Creek	Dissolved oxygen
10403	1	Cedar Creek	Bacteria
77961	4A	Gibson Creek	Dissolved oxygen
72462	1	Gibson Creek	Bacteria
5876	4A	Chehalis River	Temperature
0419	1	Chehalis River	Bacteria
7744	4A	Black River	Dissolved oxygen
7746	4A	Black River	Temperature
10993	2	Black River	pH
10697	1	Black River	Ammonia-N
6666	1	Black River	Bacteria

- The Black River is closed to further consumptive appropriation; an exception is made for domestic and normal stockwatering where there is no alternative source of water supply (WAC 173-522-050).


DRAFT
WATERSHED BASIN MAP
BLACK
Legend
City Limits
Roads
Railroads
Outer Counties
Federal\State Lands
Tribal Boundaries
Parcel Ownership
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:56,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Black Basin
Acres - 50,448
Washington State Dept of Natural Resources, 2011
BLACK
Rony
Porter
Lankner
Cedarville
Oakville
Bald
Chehalis Village
CAPITOL STATE FOREST
HARRIS BLOCK STATE FOREST
THURSTON COUNTY
PACIFIC COUNTY
LEWIS COUNTY

WRIA 23 – Lincoln Creek Subbasin Profile

Area: 49,051 (77 square miles)

Major waterbodies: Chehalis River; Gaddis, Rock, Williams, South Fork Garrard, and Garrard Creeks

Watershed description: Unincorporated population is 956 and includes the rural community of Cedarville. Land uses: agriculture (6.9%), forestry (84.3%), residential (8.0%), open space preservation (0.7%), all other (0.08%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 2,934 acres
- Number of property owners: 41

Predominant agricultural activities: hay/sileage, 3 dairies, pasture, livestock

Wetlands:

- Acres on Current Use Open Space lands: 231 acres
- Number of property owners: 4

Frequently flooded areas:

- Acres on Current Use Open Space lands: 1,771 acres
- Number of property owners: 26

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: 0
- Acres on Current Use Open Space lands: 2,604 acres
- Number of property owners: 34

Geologically hazardous areas: Seismic hazard areas

- Acres on Current Use Open Space lands: 2,898 acres
- Number of property owners: 36

Geologically hazardous areas: Landslide hazard areas

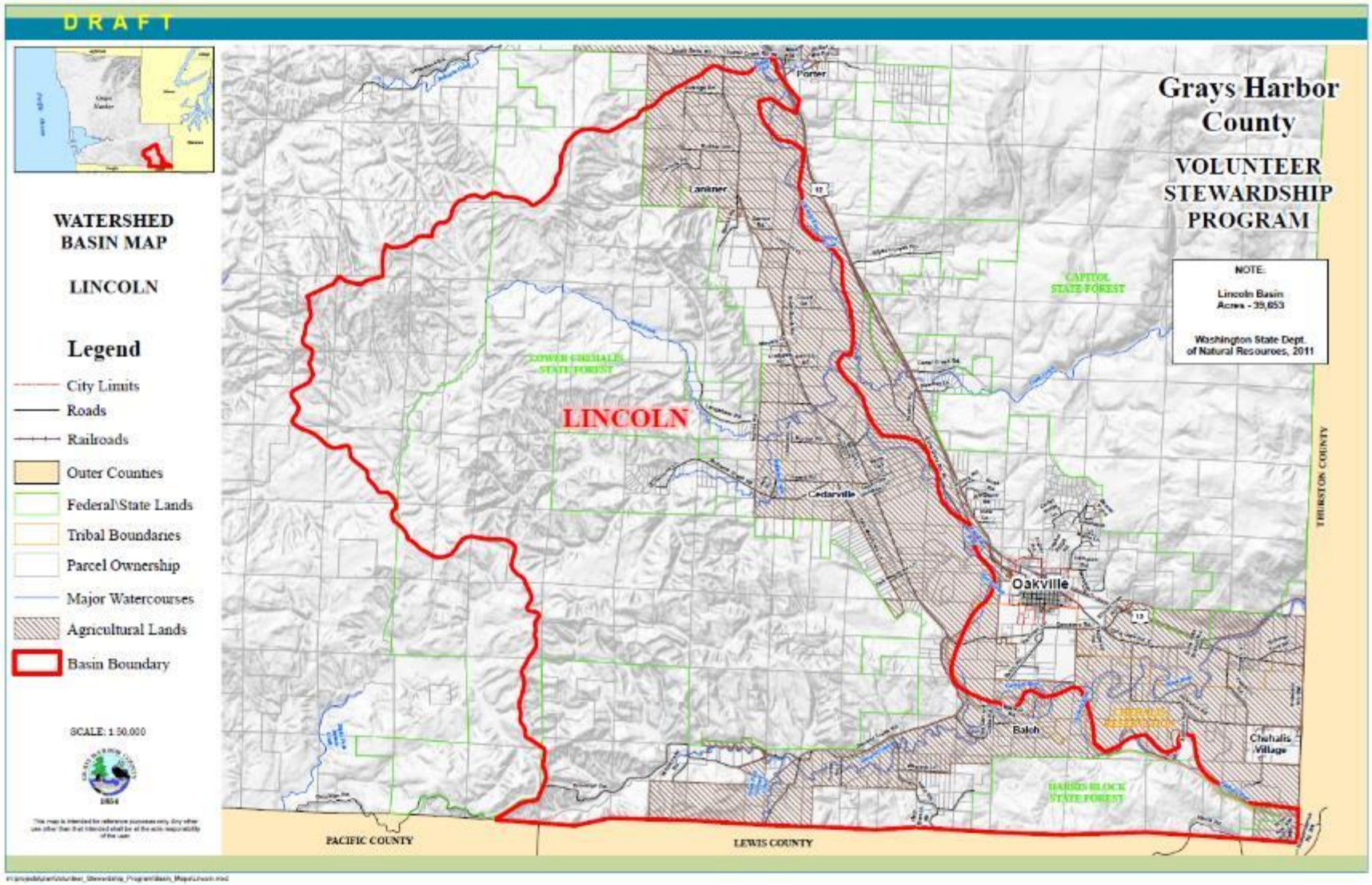
- Acres on Current Use Open Space lands: 568 acres
- Number of property owners: 4

Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 2,531 acres
- Number of property owners: 37
- Salmonid stocks and status:
  - Coho – healthy
  - Cutthroat – unknown
  - Winter steelhead – healthy
  - Bull trout – critical habitat
- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites, great blue heron colony, marbled murrelet, trumpeter swan overwintering area, wood duck nesting/brood areas, waterfowl wintering area, bald eagle nest/roost buffers, eastern wild turkey
  - Mammals: Roosevelt elk winter range
  - Fish: bull trout, Chinook salmon, chum salmon, coho salmon, cutthroat trout, largemouth bass, mountain whitefish, rainbow trout, steelhead trout, Olympic mudminnow, pacific lamprey, riffle sculpin
  - Habitat: south bank crucial winter range,
- Water quality/quantity issues: The 303(d)water quality reports for the subbasin within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
35686	2	Gaddis Creek	pH
10405	4A	Rock Creek	Bacteria
11617	4A	Rock Creek	Dissolved oxygen
11620	4A	William Creek	Dissolved oxygen
11621	2	William Creek	pH
11622	2	William Creek	Temperature
7760	4A	Garrard Creek	Dissolved oxygen
10425	1	Garrard Creek	Bacteria

- Lincoln, Garrard, Rock, and William Creeks are closed to further consumptive appropriation; an exception is made for domestic and normal stockwatering where there is no alternative source of water supply (WAC 173-522-050).


DRAFT
WATERSHED BASIN MAP
LINCOLN
Legend
City Limits
Roads
Railroads
Outer Counties
Federal\State Lands
Tribal Boundaries
Parcel Ownership
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:50,000
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
Lincoln Basin
Acres - 39,653
Washington State Dept. of Natural Resources, 2011
LINCOLN
Porter
Lankner
Cedarville
Oakville
Balch
Chehalis Village
CAPITOL STATE FOREST
LOWER CHEHALIS STATE FOREST
HARRIS BLOCK STATE FOREST
CHEHALIS RESERVATION
THURSTON COUNTY
PACIFIC COUNTY
LEWIS COUNTY

WRIA 24 – North River Unit Profile

Area: 77,296 Acres (121 square miles)

Major waterbodies: North and Little North Rivers, Salmon, Turtle, Beaver, Alder, Vesta, and Pioneer Creeks

Watershed description: Unincorporated population is 295 and includes the rural communities of Vesta and Artic. Land uses: agriculture (0.2%), forestry (98.3%), residential (1.4%), all other (0.04%).

Estimated agricultural acreage:

- Acres enrolled in Current Use Open Space: 215 acres
- Number of property owners: 5

Predominant agricultural activities: Hay/silage, pasture

Wetlands:

- Acres on Current Use Open Space lands: 30 acres
- Number of property owners: 1

Frequently flooded areas:

- Acres on Current Use Open Space lands: 105 acres
- Number of property owners: 4

Critical aquifer recharge areas:

- Wellhead protection acres on Current Use Open Space lands: 0
- Acres on Current Use Open Space lands: 109 acres
- Number of property owners: 3

Geologically hazardous areas: Seismic

- Acres on Current Use Open Space lands: 175 acres
- Number of property owners: 4

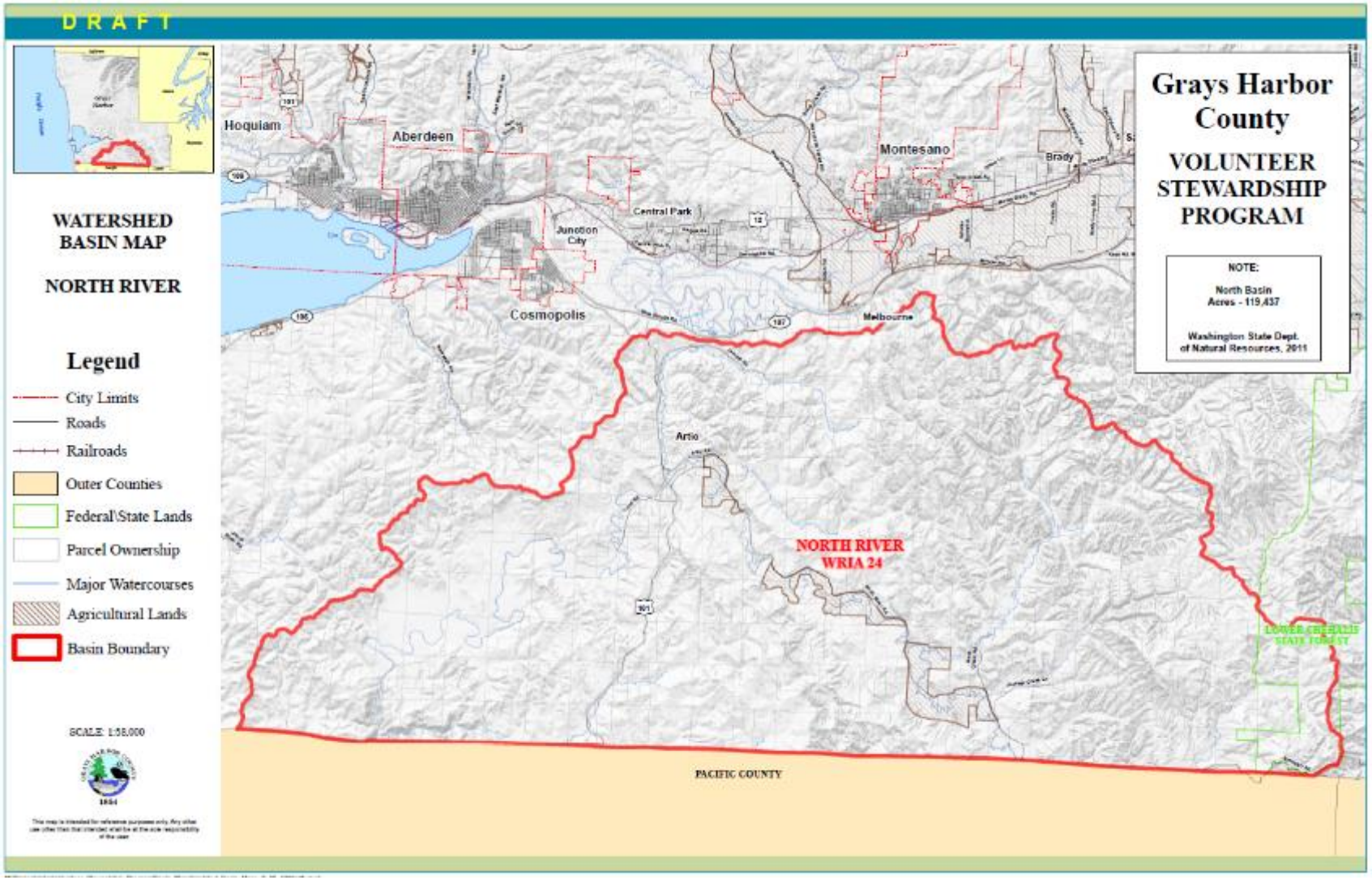
Fish and wildlife habitat conservation areas:

- Acres on Current Use Open Space lands: 66 acres
- Number of property owners: 2
- Salmonid stocks and status:

- Fall Chinook – healthy
- Coho – unknown
- Fall chum – healthy
- Cutthroat – unknown
- Winter steelhead – unknown

- Priority habitats and species in the subbasin:
  - Birds: spotted owl sites, marbled murrelet, northern goshawk
  - Mammals: Roosevelt elk winter range,
  - Fish: chinook salmon, chum salmon, coho salmon, cutthroat trout, steelhead trout, reticulate sculpin
  - Other: Columbia torrent salamander, cope's giant salamander, Dunn's salamander, Van Dyke's salamander
- Water quality/quantity issues: The 303(d)water quality reports for the subbasin within proximity to agricultural lands include the following:

Listing Id	Current Category	Waterbody	Parameter
6913	5	North River	Temperature
75287	1	North River	Endrin
75379	1	North River	Endrin Aldehyde
76263	1	North River	Dieldrin
75546	1	North River	Heptachlor Epoxide
76541	1	North River	Toxaphene
75747	1	North River	Hexachlorocyclohexane (Lindane)
78941	1	North River	Polychlorinated Biphenyls (PCBs)
72204	1	North River	4,4'-DDE
79607	1	North River	Aldrin
75203	1	North River	Beta-BHC
78774	1	North River	Endosulfan
75626	1	North River	Hexachlorobenzene
74532	1	North River	4,4'-DDD
74532	1	North River	4,4'-DDT
76988	1	North River	Chlordane
78507	1	North River	2,3,7,8-TCDD (Dioxin)
75129	1	North River	Alpha-BHC
79465	1	North River	Mercury
75468	1	North River	Heptachlor


DRAFT
Grays Harbor County
VOLUNTEER STEWARDSHIP PROGRAM
NOTE:
North Basin Acres - 119,437
Washington State Dept. of Natural Resources, 2011
WATERSHED BASIN MAP
NORTH RIVER
Legend
City Limits
Roads
Railroads
Outer Counties
Federal\State Lands
Parcel Ownership
Major Watercourses
Agricultural Lands
Basin Boundary
SCALE: 1:58,000
Hoquiam
Aberdeen
Central Park
Junction City
Cosmopolis
Montesano
Brady
Melbourne
Artic
NORTH RIVER
WRIA 24
PACIFIC COUNTY

Section Five:

Survey of Watershed Studies & Plans

There are a considerable number of studies and plans about critical areas within the county's watersheds that provide understanding into their function, value, and risks. This section identifies those studies and plans that were most important in guiding the overall development of the Grays Harbor County VSP approach, setting VSP Benchmark strategies, and selecting those stewardship practices that would have the greatest benefit to critical areas. The Technical Provider should consult these resources whenever site investigations or field inspections reveal an intersection between an agricultural property and a critical area.

Critical Aquifer Recharge Areas

The most-recent primary resource for critical aquifer recharge areas is the USGS publication, *Hydrogeologic Framework and Groundwater/Surface-Water Interactions of the Chehalis River Basin, Southwestern Washington*, published in 2011. The report describes the hydrological setting within the basin, including the extent of hydraulic conductivity for the six categories of confined and unconfined aquifers. While the report does not provide any policy recommendations, it has usefulness in understanding the relationship and impact on hydraulic continuity because of groundwater withdrawal. This information is important for understanding the need for protecting irrigation practices and salmon habitat during the drier summer months.

Two Department of Ecology publication, Critical Aquifer Recharge Areas (January 2005) and Washington Nitrate Prioritization Project (May 2016), provide useful general guidance on protecting critical aquifer recharge areas used for potable water supply.

FWHCA - Salmon Recovery Planning

Along with agriculture and forestry, salmon is a cornerstone to the Grays Harbor County economy. Salmon and steelhead recovery efforts are very active within the county's watersheds and subbasins. There are numerous agencies and organizations involved in some level of involvement, whether that be direct or indirect participation. The following is an overview of those entities directly involved in managing salmon recovery efforts, including summary of their plans. It should also be noted that these entities provide valuable funding opportunities for protecting and enhancing critical areas on agricultural lands that benefit salmon.

Washington Coast Sustainable Salmon Plan

The Washington Coast Sustainable Salmon Plan[28] prepared by Coast Salmon Partnership is a regional approach for ensuring that "All watersheds in the Washington Coast region contain healthy, diverse, and self-sustaining populations of salmon, maintained by healthy habitats and ecosystems, which also support the ecological, cultural, social, and economic needs of human communities."

Elements from the regional plan relevant to agricultural and critical areas that benefit salmon recovery include:

- Educate and involve the community to protect, restore and maintain ecosystem values
- Work to inform officials, landowners, industry, business, agencies, and the public about invasive species
- Inform public officials and increase public outreach on environmental values to make shoreline modification more salmon-friendly
- Reach out to public officials, landowners and others about the value of preserving marginal land
- Communicate with local elected officials and residents about stormwater and wastewater pollution
- Protect and restore salmon habitat function
    - Use habitat protection tools & techniques to maintain or restore in channel salmon habitat that is key in light of climate change
    - Coordinate a region-wide invasive species workgroup and serve as a hub for regional invasive species information
    - Restore buffer and instream channel function by retaining large trees in riparian zones and landscaping with native plants
    - Correct existing fish barriers
    - Encourage the implementation of water quantity planning efforts
    - Reduce dredging and filling of estuaries, rivers and wetlands
- Use economic tools to protect, restore, and maintain ecosystem values
    - Support incentives for keeping agriculture, timber, and residential land use

A key salmon recovery effort being coordinated by the Coast Salmon Partnership is the Washington Coast Restoration Initiative (WCRI). The focus of this program is to fund high priority salmon recovery projects within the region, including Grays Harbor County. WCRI is funded through a capital budget request through the Washington State

Legislature. Example of current and proposed projects under WCRI funding in the county include riparian restoration, removal of invasive species, culvert replacements, and floodplain restoration.

Lead Entity Strategies

Lead entities are local, watershed-based organizations that develop local salmon habitat recovery strategies within Watershed Resource Inventory Areas (WRIA). Lead Entities use these strategies to recruit project sponsors to do voluntary habitat protection and restoration projects that will implement the strategies. Lead entities perform an essential role in salmon recovery in Washington State and Grays Harbor County specifically. Lead entities are organized and funded under Chapter 77.85 RCW.

Participating lead entities within Grays Harbor County include the Quinault Indian Nation Lead Entity (WRIA 21), Chehalis Basin Lead Entity (WRIA 22 and 23), and the Pacific County Lead Entity (WRIA 24).

WRIA 21 – Quinault Lead Entity

The Quinault Lead Entity in the county includes the drainages of Quinault, Copalis, and Moclips subbasins in the northwest corner of the county. The Quinault Indian Nation administers the lead entity. Commercial agriculture in this WRIA is limited in scope.

The vision of their strategic plan is: "All of the watersheds in WRIA 21 will contain healthy, diverse populations of salmon sustained by healthy ecosystems that are supported by undisrupted physical and biological processes, and contain abundant, contiguous aquatic and riparian habitats utilized by diverse, species-rich biological communities that support and service the cultural and other value-based needs of local stakeholders".

There are no threatened or endangered salmon species in WRIA 21. Bull trout, a listed salmon species, is considered present, and a considerable amount of habitat suitable for bull trout is found in the upper Queets and Quinault systems. The watersheds in WRIA 21 are prioritized into three categories; two large systems that dominate the area (Queets and Quinault Watersheds), three intermediate size rivers with characteristics in common (Moclips, Raft, and Copalis Rivers), and several small streams with independent entry into the Pacific Ocean.

WRIA 22 & 23 – Chehalis Lead Entity

The Chehalis Basin is the second largest watershed (WRIA 22 and 23) in the state that extends over large areas Grays Harbor, Thurston, and Lewis Counties as well as smaller portions of Mason and Pacific Counties. The Chehalis Lead Entity operates with this

large and diverse watershed that contains nine subbasins within the county alone. WRIA 22 and 23 covers the largest area within the county and it contains most of its agricultural lands. Grays Harbor County administers the lead entity.

There three goals guiding The Chehalis Basin Salmon Habitat Restoration and Preservation Strategy for WRIA 22 and 23[29] are:

1. Contribute to the biological diversity of salmon stocks within the State of Washington;
2. Concentrate efforts on those subbasins within WRIAs 22 & 23 that have the greatest quantity of fish habitat; and
3. Identify and rank general preservation, restoration, and data gap actions within subbasins that lead to the overall goal.

The lead entity strategy works towards these goals with specific strategies for restoring habitat for each of the nine WRIA subbasins within the county's boundaries. Each subbasin profile within this WRIA contains a list of projects and stewardship practices relevant to agricultural lands.

WRIA 24 – Pacific County Lead Entity

The Pacific County Lead Entity, coordinated by the Pacific Conservation District, covers the North River subbasin in the southwest corner of the county, which drains into Willapa Bay. There is narrow corridor of commercial agriculture in the river valley east of Highway 101 to Vesta.

The Pacific County Strategic Plan for Salmon Recovery is the primary document for guiding the funding of salmon recovery projects.[30] The mission of the lead entity aims to "...maintain and enhance the existing base of functional salmon habitat, encourage volunteer opportunities to restore, and acquire lands for ecosystem function, and protect existing environmental health."

There are four principles guiding the strategy:

1. Using the best available information, target the most biologically important areas for salmon restoration and protection;
2. Within WRIA 24, enhance, restore and protect key habitat;
3. Do the most cost-effective projects first; and
4. Encourage community (public and private) support and participation through education and public outreach.

The strategy identifies recovery actions relevant to its agricultural areas in the North River subbasin.

Regional Fisheries Enhancement Groups (RFEG)

Regional Fisheries Enhancement Groups predate the establishment of the Lead Entities and operate within the same WRIA boundaries in the county. This includes the Pacific Coast Salmon Coalition (includes WRIA 21), the Chehalis Basin Fisheries Task Force (WRIA 22 and 23), and the Willapa Bay Regional Fisheries Enhancement Group (WRIA 24). Each of these RFEG are separate, local nonprofit groups aided at restoring salmon populations. In addition to stream supplementation with hatchery releases, the RFEGs also are actively engaged in habitat restoration, assessment and monitoring, and education and outreach projects. Base funding for the RFEG program comes from a grant from the U.S. Fish & Wildlife Service's Partners for Fish and Wildlife Program, a portion of state commercial and recreational fishing license fees, and excess egg and carcass sales administered by the Washington Department of Fish & Wildlife.[31]

Both RFEG have plans that identify approaches and projects that benefit salmon recovery within the framework of their organizational mandates.

Habitat Work Schedule and SalmonScape

The Habitat Work Schedule (HWS) is a statewide data tool available for tracking projects for salmon recovery. HWS lists completed, active, proposed, and conceptual projects that is searchable on county, district, and watershed basis. HWS has great value both as a monitoring tool as well as a source of potential projects that may fall on or intersect with agricultural lands in the county.

SalmonScape is another database tool provided by the Washington Department of Fish and Wildlife that can help identify and prioritize restoration and protection activities on agricultural lands. SalmonScape contains maps with information on fish stock distribution, juvenile fish monitoring, habitat characteristics, and stream blockages that impede fish passage.

Other General Guidance Documents

The extensive USDA/NRCS publication Stream Corridor Restoration: Principles, Processes, and Practices (August 2001) aids in understanding the riparian ecosystem and impacts related to human disturbances as well as designing and implementing stream corridor restoration approaches

FWHCA – Other Fish & Wildlife Species

In addition to salmon, Grays Harbor County has a wealth of other fish and wildlife species. The primary planning document for addressing the needs of these other species in the county is from the State of Washington Department of Fish and Wildlife. The report Threatened and Endangered Wildlife: 2012 Annual Report, summarizes recovery management actions for 46 endangered, threatened, and sensitive wildlife species in the state. This report is useful in identifying appropriate stewardship practices for managing fish and wildlife that may be present on county agricultural lands.

Watershed Management and Water Quality Planning

Chehalis Watershed Management Plan

The Chehalis Basin Partnership prepared the Chehalis Basin Watershed Management Plan 2004 to examine water quantity, water quality, instream flow, and habitat issues in the basin.[32] The plan was developed under Chapter 90.82 RCW, the Watershed Planning Act. The Chehalis Basin Partnership remains the representative body responsible for implementing the plan.

Analysis in the plan found that instream flows are not always met; there is not enough water in the basin from July through October to meet the needs of all existing water rights, let alone the ability to grant rights to new users. This scenario forces the Department of Ecology to manage water in the basin through water rights transfers and closures in portions of some subbasins to new water rights.

The net impact of reduced water quantity has affected water quality in many subbasins. As flows reduce in the summer months, water temperatures rise and dissolved oxygen decreases. This in turn has affected the viability of salmon in streams.

The purpose of the plan was to "…attempt to satisfy all existing and future needs for water withdrawals, while assuring adequate water in streams."

The plan established the following goals and objectives for the basin:

- Public Involvement
  - Goal: Use the Citizen Advisory Committee and increase public information and involvement to raise awareness of citizens about watershed issues.
  - Goal: Gain input from the public in developing and adopting the Plan.
  - Goal: Encourage basin residents to implement the Plan, with government support.

- Water Quantity Goal & Objectives
  - Goal: Bridge the gap between existing stream flows and target flows for fish, wildlife and human use.
  - Objective: Clarify Washington State water law to citizens.
  - Objective: Conduct a water balance for the Basin, including complete groundwater data.
  - Objective: Identify tools available to meet this goal.
- Water Quality Goal & Objectives
  - Goal: Prevent degradation of and/or improve water quality to have clean water (as defined in Washington State water quality standards) for all fish, wildlife and human uses.
  - Objectives: Consider improving water quality through increasing water quantity (using tools identified above).
  - Objective: Implement current and future water quality cleanup plans.
  - Objective: Develop strategies to identify and prevent water quality degradation.
- Habitat
  - Goal: Prevent degradation and improve habitat to support self-sustaining fish and wildlife populations and to support water quality and quantity goals.

To achieve these goals and objectives, the plan recommended a series of management actions summarized below:

- Water Quantity
  - Conduct groundwater studies to better understand hydraulic continuity
  - Inform water rights applicants about flexible strategies for meeting their water rights needs
- Water Rights
  - Make available a "tool box" of alternative approaches for those seeking water rights, water rights data and tracking, and enforcement
- Exempt Wells
  - Evaluate the impact of exempt wells on subbasin stream flows
- Water Conservation
  - Promote, encourage, and support water conservation by
    - Coordinating efforts that benefit all purveyors in the basin

- Providing opportunities for cooperative efforts that support agricultural and instream flows
- Finding reasonable options for improving management of water (irrigation) rights
- Consider the Trust Water Rights Program as a method for preserving water rights and instream flows
- Adopt policies protecting water supply for agricultural lands of long term commercial significance

▶ Water Quality

- Develop and implement a water quality monitoring program that protect healthy waters from becoming impaired and requiring Total Maximum Daily Load (TMDL) reporting
- Develop approaches to keep agriculture and forestry on the land
- Control invasive species

▶ Habitat

- Encourage coordination of restoration efforts among organizations
- Develop a coordinated habitat restoration strategy
- Monitor the efficacy of restoration efforts
- Inform landowners on how to protect habitat on their property

▶ Instream Flows

- Preserve and monitor the 1976 instream flow levels set for streams in the basin
- Encourage voluntary monitoring of instream flow

The Partnership has also developed a Detailed Implementation Plan that includes work programs for many of the management actions described above.[33]

Total Maximum Daily Load Studies

Under the federal Clean Water Act, the State of Washington sets water quality standards to protect, restore, and preserve water quality. The purpose of the standards is to protect or restore beneficial uses, such as fisheries or agriculture, as well as to protect human health. The State of Washington's Department of Ecology conducts water quality data collection, prepares assessments, and undergoes planning process to determine projects to begin each fiscal year.

Through this process, Ecology assigns a numerical value to streams representing the highest amount of pollutant a surface water body can receive from a nonpoint source and still meet water quality standards.[34] When a waterbody fails to meet water quality standards after application of the standard, the Clean Water Act requires the state to place the waterbody on a list of "impaired" water bodies and prepare a Total Maximum Daily Load (TMDL). The goal of the TMDL is to ensure the impaired water eventually attains water quality standards. Information on listed waters is in printed reports and in digital format on the internet.[35]

The state lists waterbodies into five categories that describe the status of water quality.

Category 1 – Segment meets tested standards Category 2 – Segment is a water of concern Category 3 – Segment lacks sufficient data	Not known to be impaired
Category 4 – Segment impaired but does not require a TMDL because: 4a – Segment has a TMDL approved by EPA 4b – Segment has a Pollution Control Program 4c – Segment impaired by non-pollutant such as low water flow, dams, and culverts Category 5 – Polluted waters that require a TMDL and is on the 303(d) list	Impaired

Only Category 5 waters make the 303(d) waters list. These waters require the preparation of water quality improvement projects, also known as TMDLs, in accordance with the Clean Water Act. The remaining categories (Categories 1 through 4, including three subcategories of Category 4) are intended to inform other water quality efforts in the State, and to inform the public about the known condition of the State's waters.

Ecology maintains a current list of 303(d) waters on its website. Segments of streams that pass through agricultural lands in Grays Harbor County are listed in each subbasin profile in this report.

TMDL studies have found that the Chehalis River and many of its largest tributaries have a history of not meeting water quality standards for instream temperature, dissolved oxygen, and fecal coliform. The following TMDL reports have been prepared within the basin that includes sections of Grays Harbor County:

- Reporting Watershed Improvement Based on Statistical Evidence of Watershed-wide Improvement, Chehalis River Basin, WA, May 2011
- Upper Chehalis River Watershed Multi-Parameter Total Maximum Daily Load – Water Quality Data Review, 2011

- Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load Recommendations, 2004
- The Chehalis/Grays Harbor Watershed Dissolved Oxygen, Temperature, and Fecal Coliform Bacteria TMDL, 2004
- Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load: Submittal Report, 2004
- Upper Chehalis River Basin Temperature Total Maximum Daily Load, 2001
- Upper Humptulips River Watershed Temperature TMDL (Water Cleanup Plan), 2001
- Upper Chehalis River Basin Dissolved Oxygen Total Maximum Daily Load Submittal Report, 2000

Many of the TMDL issues identified in these studies are a result of forestry and urban uses within the watershed.

The May 2001 reports states that restoration and monitoring efforts in the watershed have shown a decline in bacteria levels since 1998. However, temperature issues continue to affect fish and habitat conditions in some subbasins.

Implementation actions that relate to agriculture from these reports that have been addressing TMDL issues include:

- All watershed dairy farmers have developed and implemented nutrient management plans.
- Planting of riparian buffers
- Riparian fencing projects that exclude livestock from riparian areas to preserve riparian vegetation and reduce fecal contamination.
- Alternative water sources for livestock
- Replacing and repairing septic systems
- Building manure containment structures
- Restoring wetlands
- Controlling stormwater runoff
- Enrolling properties into the Conservation Restoration and Enhancement Program (CREP) to remove lands from agricultural production.
- Educating landowners and the public about water quality issues

Cranberry Production and Water Quality Study

The Washington State Department of Agriculture released The Grayland Ditch; An Evaluation of the Effectiveness of Best Management Practices in Preventing Pesticides from Entering Cranberry Bog Drainage Ditches, in March 2014. This study examined pesticide pollution entering surface waters (Grays Harbor County Drainage Ditch No. 1) that support cranberry growing operations areas in the Grayland area.

The study found that approximately 95% of the growers voluntarily were implementing one or more best management practices (BMPs) for reducing pesticides entering the ditch. However, pesticide levels continue to exceed water quality standards. As a result, the study outlines continued strategies for effective removal of pesticides.

The most effective BMPs for keeping pesticides on the bogs and out of the ditches are:

- Isolating the perimeter ditches at the bog by lining and covering the perimeter ditches with exterior treated wood
- Holding irrigation water with pesticide residues on-site to allow natural degradation
- Installing carbon filters to treat irrigation water before entering ditches

Chapter 16-232 WAC now requires all cranberry growers to:

- Restrict the use of chlorpyrifos and diazinon when applied to cranberries
- Require cribbing and covering of ditches adjacent to cranberry beds
- Requiring protection of source water when applying cranberry beds with chlorpyrifos and diazinon

Floodplain Studies

Governor's Chehalis Basin Work Group – 2014 Recommendation Report

Frequent flooding is a widespread occurrence in many agricultural areas of the county that periodically causes significant damages to crops, livestock, and property. There have been a series of plans that have studied the issue over the years, with the most current being the Governor's Chehalis Basin Work Group that was established in response to catastrophic flood events.[36]

This basinwide plan extends to both WRIA 22 and 23 and calls for a four-point approach:

- Initiation of the permitting for a concrete flood retention structure on the upper Chehalis River, paired with improvements to the Chehalis-Centralia Municipal Airport Levee.
- Basinwide effort to restore aquatic species and reverse the decline of spring Chinook, including restoration of over 100 miles of spring Chinook spawning and rearing habitat, repair of priority fish passage barriers, restoration of off-channel habitat for aquatic species, and a comprehensive strategy to address bank erosion.
- Continued investment in the highest-priority, smaller-scale flood-damage reduction projects including raising homes, and floodproofing businesses and public structures, with an emphasis on projects with multiple benefits. The Wynoochee Valley Road Raise is a project identified with significant benefit to county agricultural properties.
- Increased local government land use management actions to protect remaining floodplain function, alongside floodproofing improvements for residents and structures.

There have been extensive technical studies prepared leading to these recommendations in the report. A draft Programmatic Environmental Impact Statement (EIS) recently was released on the report recommendations; a final EIS is expected sometime in 2017.

Comprehensive Flood Hazard Management Plans

The county prepared a series of flood management plans that collectively became the Comprehensive Flood Hazard Management Plan in 2001. Study areas within these documents included the South Coast and Grayland area, North Beach, Vance Creek, and the basins for the Wynoochee, Satsop, and Humptulips Rivers.

These plans examined a range of flood hazard management measures that included improved land use regulations, floodplain conservation easements, floodproofing, and structural improvements.

Farmland Protection Plans & Codes

Growth Management Compliance

Despite not fully planning under the Growth Management Act (GMA), Grays Harbor County is required to designate agricultural lands of long-term commercial significance. However, GMA does not require the county to adopt regulations to conserve agricultural lands of long-term commercial significance.

The county's designation for agricultural lands of long-term commercial significance include:

1. Areas within the county identified as agricultural lands of long-term commercial significance shall meet one or more of the following criteria:
    a. Parcels with prime agricultural soils as identified by the "Soil Survey of Grays Harbor County Area, Pacific County, and Wahkiakum County, Washington" and not designated forest lands under RCW 84.33 or timber classified under RCW 84.34;
    b. Parcels within the A-1 and A-2 zoning districts;
    c. Parcels currently used or have been used for the production of cranberries and classified under either land use code 96 or 97;
    d. Parcels classified as farm and agricultural land under Open Space Law RCW 84.34;
    e. Parcels enrolled in federal conservation reserve programs; and/or
    f. Areas approved by the state department of health for commercial shellfish production in accordance with RCW 69.30.050.[37]

Agricultural Element to the Comprehensive Plan

The county adopted an agricultural element for its comprehensive plan in May 1981 aimed at protecting farmland. The areas covered in the plan mirror the distribution of today's agriculture within the subbasins of WRIAs 21, 22, 23, and 24.

The plan establishes a series of goals, objectives, and policy statements that "conserve and protect agricultural lands from incompatible development and to encourage the continued economic viability of agriculture." Preventing the conversion of prime agricultural land to other uses is a focal point of the plan. The plan adopts a future land use map delineating two agricultural zoning districts, Agricultural 1 and 2, that generally remains in place today. The Agricultural 1 district serves areas with small to moderate farming activities on parcels 10 acres or more. The Agricultural 2 district aims at conserving and protecting agricultural lands used by large commercial farms that are a minimum of 40 acres in area. In both districts, there are limitations on non-agricultural uses to ensure agricultural activities remain on the land.

Title 17 - Zoning of the Grays Harbor County Code, specifically Chapters 17.12 and 17.16, implement the agricultural element.

Grays Harbor County also has a right-to-farm ordinance under Chapter 8.34 of the county code. This code applies to both agriculture and forestry with the intent of eliminating nuisance concerns by other used located near these activities.

1

2 List of Plans, Studies, and Resources Cited and Relevance to Critical Areas and Agricultural Viability

Plans, Studies, & Resources	Relevance to: CARA	Wetlands	FWHCA	FFA	GHA	AV
			●			
Chehalis Basin Lead Entity Strategy for WRIAs 22 & 23			●			
Chehalis Basin Fisheries Task Force (RFEG) Strategy			●			
Chehalis Watershed Management Plan and Detailed Implementation Report			●	●	●	●
Final Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington			●			
Final Recovery Plan for the Western Snowy Plover			●			
Final Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington			●			
Final Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington			●			
Framework and Groundwater/Surface Water Interactions of the Chehalis River Basin, Southwestern Washington	●	●	●			●
Governor's Chehalis Basin Work Group – 2014 Recommendation Report			●	●		
Habitat Work Schedule			●			
Grays Harbor County Code Chapter 8.34, Right to Farm						●
Grays Harbor County Code Chapter 17.12 & 17.16, Zoning						
Grays Harbor County Comprehensive Plan – Agricultural Element						●
Grays Harbor Comprehensive Flood Hazard Management Studies				●	●	
Management Recommendations for Washington's Priority Species			●			
Office Revised Recovery Plan for the Oregon Silverspot Butterfly (Speyeria zerene hippolyta)			●			
Pacific County Lead Entity Strategy (WRIA 24)			●			

Plans, Studies, & Resources	Relevance to: CARA	Wetlands	FWHCA	FFA	GHA	AV
Recovery Outline for the Contiguous United States Distinct Population Segment of Canada Lynx			●			
Recovery Plan for the Coterminous United States Population of Bull Trout			●			
Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle			●			
Recovery Plan for the Threatened Marbled Murrelet			●			
Regional Fisheries Enhancement Group strategies			●			
Reporting Watershed Improvement Based on Statistical Evidence of Watershed-wide Improvement, Chehalis River Basin, WA			●			●
Revised Recovery Plan for the Northern Spotted Owl			●			
Short-Tailed Albatross (Phoebastria albatrus) Final Recovery Plan			●			
Stream Corridor Restoration: Principles, Processes, and Practices		●	●	●	●	●
The Chehalis/Grays Harbor Watershed Dissolved Oxygen, Temperature, and Fecal Coliform Bacteria TMDL			●			
Threatened and Endangered Wildlife: 2012 Annual Report			●			
Upper Chehalis River Basin Dissolved Oxygen Total Maximum Daily Load Submittal Report			●			
Upper Chehalis River Basin Temperature Total Maximum Daily Load			●			
Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load Recommendations			●			
Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load: Submittal Report			●			
Upper Chehalis River Watershed Multi-Parameter Total Maximum Daily Load – Water Quality Data Review			●			
Washington Coast Sustainable Salmon			●			
Water Howellia Recovery Plan, Public and Agency Review Draft			●			

1

Endnotes

[1] Agricultural Element of the Grays Harbor County Comprehensive Plan; May 1981.

[2] WAC 173-26-020 (a)-(d)

[3] WAC 173-26-020 (6). Also see RCW.70A.703 (1) and RCW 90.58.065

[4] To receive reduced assessment, farm and agricultural land must meet one of the following requirements:

- 20 or more acres in agricultural use;
- 5 or more, but less than 20 acres in agricultural use with an annual income of $200 or more per acre for three out of five years; or
- Less than 5 acres in agricultural use with an annual income of $1,500 or more for three out of five years. See Current Use Assessment Levies Due in 2016

[5] About the Census of Agriculture

[6] Falling Response Rates to USDA Crop Surveys: Why it Matters, Farmdocdaily (January 2017)

[7] This research report was unable to find an explanation for the extensive jump in acreage from 2002 to 2007.

[8] "Short rotation woody crop" are trees grown for pulp or tree stock having a typical growth cycle of 10 years or less (Christmas trees, cottonwood for pulp, tree farms).

[9] Organic farms and businesses with less than $5,000 gross annual organic sales

[10] https://www.fws.gov/wetlands/data/Mapper.html

[11] http://waecy.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=22edd2e4e7874badbef2a907a3cd4de6

[12] The areal extent of the aquifers, as shown in this map layer, represents the area in which a named aquifer is the shallowest of the principal aquifers. These aquifer areas are not necessarily the only areas in which ground water can be withdrawn, for two reasons: 1) The aquifers shown may have a larger areal extent than is represented here. The boundaries in this map layer generally represent an interpretation of the surface location (outcrop), or near-surface location (shallow subcrop) of the uppermost principal aquifer for the area. An aquifer may extend beyond the area shown, but be overlain by one or more other aquifers, and (or)permeability material. 2) There may be areas of water-bearing surficial material not shown in this map layer. Major alluvial aquifers that occur along main watercourses are not shown. Significant sand and gravel aquifers, that are not indicated in this map layer but are important sources of water, may occur locally in glaciated regions. The user of this map layer is advised that to get complete information regarding areas that serve as sources of water, more about surficial aquifers needs to be obtained, particularly in glaciated areas.

[13] http://wdfw.wa.gov/mapping/phs/ Information on specific locations of some fish and wildlife species in this data are deemed "sensitive" and access is restricted by Washington Department of Fish and Wildlife (WDFW) under its Releasing Sensitive Fish and Wildlife Policy - 5210. Release of "sensitive" fish and wildlife information will be granted to only those parties after a signed Sensitive Fish and Wildlife Information Release Agreement has been obtained.

[14] http://www.ecy.wa.gov/programs/wq/303d/index.html

[15] https://www.fema.gov/national-flood-hazard-layer-nfhl The Digital Flood Insurance Rate Map (DFIRM) Database depicts flood risk Information and supporting data used to develop the risk data. The primary risk; classifications used are the 1-percent-annual-chance flood event, the 0.2-percent- annual-chance flood event, and areas of minimal flood risk. The DFIRM Database is derived from Flood Insurance Studies (FISs), previously published Flood Insurance Rate Maps (FIRMs), flood hazard analyses performed in support of the FISs and FIRMs, and new mapping data, where available. The FISs and FIRMs are published by the Federal Emergency Management Agency (FEMA). The file is georeferenced to earth's surface using the UTM projection and coordinate system. The specifications for the horizontal control of DFIRM data files are consistent with those required for mapping at a scale of 1:12,000. The FIRM is the basis for floodplain management, mitigation, and insurance activities for the National Flood Insurance Program (NFIP). Insurance applications include enforcement of the mandatory purchase requirement of the Flood Disaster Protection Act, which "... requires the purchase of flood insurance by property owners who are being assisted by Federal programs or by Federally supervised, regulated or insured agencies or institutions in the acquisition or improvement of land facilities located or to be located in identified areas having special flood hazards," Section 2 (b) (4) of the Flood Disaster Protection Act of 1973. In addition to the identification of Special Flood Hazard Areas (SFHAs), the risk zones shown on the FIRMs are the basis for the establishment of premium rates for flood coverage offered through the NFIP. The DFIRM Database presents the flood risk information depicted on the FIRM in a digital format suitable for use in electronic mapping applications. The DFIRM database is a subset of the Digital FIS database that serves to archive the information collected during the FIS.

[16] These data contain polygons defining the extent and characteristics of mapped landslides in the State of Washington. This dataset is a compilation of pre-existing landslide databases from several sources, including the Washington Divisions of Geology and Earth Resources and Forest Practices, and other federal and private compilers. As such, the mapped landslides were originally created to meet a variety of purposes. It also includes more recent landslides mapped by the Washington Division of Geology and Earth Resources. This compilation does not include all landslides that may exist in Washington State.

[17] These data contain polygons that provide information regarding the relative liquefaction potential for Washington State. This feature class is part of a geodatabase that contains statewide ground response data for Washington State. Other feature classes are seismic design class d, seismic design site class, and seismic site class. Liquefaction is a natural phenomenon in which saturated, sandy soils lose their strength and behave as liquid. Liquefaction is a caused by severe ground shaking during earthquake events. Polygons are classified as having 'very low' to 'high' relative liquefaction susceptibility. Areas underlain by bedrock or peat are mapped separately as these earth materials are not liquefiable, although peat deposits may be subject to permanent ground deformation caused by earthquake shaking and require site-specific analysis under the International Building Code. Water and ice are also separately designated.

[18] This shapefile represents areas that would be expected to be inundated by tsunamis generated by scenario earthquakes. The areas are identified by numerical models that are adjusted for local topography or paleoseismic data. The areas for which data are shown include parts of the shorelines of Pacific, Grays Harbor, Jefferson, Clallam, Island, King, Skagit, and Whatcom Counties, Washington. These data were developed for three different earthquake scenarios, identified as Cascadia subduction zone (CSZ) scenario1A, scenario 1A with asperity, and the Seattle fault scenario.

[19] RCW 36.70A.030(23)

[20] WAC 365-190-030(3)

[21] These include all waters under the jurisdiction of the Shoreline Management Act
[22] https://wdfw.wa.gov/conservation/phs/list/
[23] https://wdfw.wa.gov/conservation/phs/mgmt_recommendations/
[24] https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=53041

[25] RCW 365-190-030(8)

[26] RCW 365-190-030(9), (5), (10), (21)

[27] Chapter 173-500 WAC

[28] Washington Coast Sustainable Salmon Plan, The Washington Coast Sustainable Salmon Partnership, May 2013 http://www.wcssp.org/index.php/about/resources

[29] http://www.chehalisleadentity.org/wp-content/uploads/2011_CBP_strategy_update_20111.pdf

[30] http://wcssp.org/Documents/Pacific%20LE%20Strategy.pdf

[31] http://wdfw.wa.gov/publications/01777/

[32] http://chehalisbasinpartnership.org/watershed-management-plan-documents/

[33] http://s590406600.onlinehome.us/wp/wp-content/uploads/2015/09/DIP-2009-Amendment-June-2009.pdf

[34] Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources.

[35] http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

[36] www.chehalisbasinstrategy.com
[37] Grays Harbor County Code Section 18.10.030