Drayton Watershed Improvement District

Preliminary Management Plan

Version 2a (November 2017)

Prepared by
Heather MacKay & Cheryl Lovato Niles
FHB Consulting Services, Lynden

Explanatory notes in grey boxes are intended to help readers to understand more about the content and purpose of this document.

The purpose of this document is to assist the WID board in the process of developing their comprehensive management plan over time, beginning with this preliminary version. The preliminary version serves as a starting framework for a comprehensive management plan, the detailed content of which will be developed as time and resources allow.

Version	Date	
Draft Version 1	September 2017	Draft for discussion by the WID board
Version 2	October 2017	Revised after WID board meeting September 2017. Some additional edits to improve clarity and readability. (H MacKay)
Version 2a	November 2017	Updated Figure 7 with information on watercourse classifications received from Whatcom Conservation District. (H MacKay)

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS USED IN THIS DOCUMENT

AU	Assessment Unit
BMP	Best Management Practice
CDID	Consolidated Drainage Improvement District
DID	Drainage Improvement District
NRCS	Natural Resource Conservation Service
RSA	Rural Study Area
SSURGO	Soil Survey Geographic Database
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WDFW	Washington Department of Fish & Wildlife
WID	Watershed Improvement District
WRIA 1	Water Resource Inventory Area 1
WSDA	Washington State Department of Agriculture

1 INTRODUCTION AND OVERVIEW OF THE PLANNING PROCESS

Explanatory notes

For this preliminary management plan, we have relied heavily on information generated during recent work with the Watershed Improvement Districts (WIDs) to characterize and map both agricultural and watershed priorities in the six WIDs.

In this document, we have included text, maps and tables contained in the Drayton WID Agriculture-Watershed Characterization and Mapping Report (2016: the "WID mapping report")[1] as reference materials. By including the actual information here where possible rather than cross-referring out to separate reports, we hope to make this document easier to use. Wherever necessary, we have noted the sources for text, maps and tables that have been copied into this document.

The focus in this preliminary plan will be on clarifying the WID's priority issues and objectives since these should be the basis for a more detailed comprehensive management plan that would include actions, budgets and timelines. Where WID actions have already been initiated, these should be included in the preliminary management plan.

1.1 Process for developing an updated comprehensive management plan for the WID

The WID planning process is expected to proceed in phases:

- Firstly, preparing a Preliminary Management Plan (this document) to include: an overview of current WID priorities; agreed near-term actions to advance the WID's priorities; a summary of relevant background information. The Preliminary Plan is based on available information generated in recent and current efforts, including:
    - the all-WID planning session in March 2017,
    - work sessions for the Ag-Watershed Characterization and Mapping in 2016,
    - ongoing water quality monitoring by the WID and the Conservation District,
    - ongoing drainage management work within the WID.

  Where additional baseline technical studies might be needed, the scope of work and estimated costs for these studies will be included in successive versions of the Preliminary Management Plan.
- Subsequently, preparing an updated Comprehensive Management Plan over time as resources and funding are secured to undertake the necessary baseline technical studies for each component of the comprehensive plan. The comprehensive plan would also include a detailed action plan with timelines for implementation.

[1] Whatcom County Agriculture-Watershed Pilot Project (2016). *Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District*. Whatcom County Planning & Development Services. http://www.draytonwid.com/ [Alternative download <here>]

1.2 Purpose and content of this document

The purpose of this document is to assist the WID board in developing their comprehensive plan over time.

This document provides a Preliminary Management Plan for the Drayton Watershed Improvement District (WID). A future comprehensive management plan could follow the same format and order as this outline, but with successively more detail and technical information being added to sections of the plan over time as resources allow.

In preparing this document, we have collated recent and current information on WID management priorities and concerns from a number of sources. Where technical and background information was readily available and could be provided without additional analysis or processing, we have included it in the relevant sections and appendices of this document. Other sections in this document are limited to a description of the content that might be included in an updated Comprehensive Management Plan but that would need additional work to prepare such content.

Section 2 contains a list of priority issues and objectives for the WID, stated as "desired outcomes". A summary list is shown in Table 1, and the process for coming up with the initial suggested list of issues is described. A more detailed list of priority issues, suggested goals against which to measure progress, and initial actions for consideration by the WID board is shown in Table 2.

Sections 3 and 4 provide a summary of available background and baseline information about the watershed and agricultural systems within the Drayton WID.

Section 5 contains supporting information on additional work and baseline studies that might be needed to prepare an action plan to achieve the WID's priorities. Actions might include:

- actions that the WID board is already undertaking or that could be initiated in future in collaboration with farmers in the WID, without the need for extra resources or expertise;
- actions that the WID is already undertaking or could undertake in future with the assistance and collaboration of key partners such as the Conservation District and drainage districts;
- actions that will require additional technical resources and for which the WID and partners will probably need to seek grant funding.

Appendices contain additional reference information, some which is reproduced from other sources but which has been included with this document for readers' convenience.

2 STRATEGIC PRIORITIES AND DESIRED OUTCOMES

2.1 Process for developing the list of suggested priorities

The project team used the following process to develop the list of suggested priorities in Tables 1 and 2 for discussion by the WID board.

1. We began with the set of priorities that were previously listed on the Drayton WID website[2] (water quality and water rights).
2. We reviewed all Drayton WID board meeting minutes back to April 2015[3] to collect relevant statements and decisions made by the WID board and grouped those statements or decisions into priority topics (comprehensive planning; drainage; flood management; habitat; outreach; representation; water quality; water quantity & water rights).
3. We added priorities identified in the February 2016 work session and described in the Drayton WID Agriculture-Watershed Characterization and Mapping Report[4] (habitats and species; water flow processes; agricultural protection).
4. The list of priorities and potential priority actions was revised after the WID Work Session held in Lynden on March 20th, 2017.
5. We built a master spreadsheet listing the main priorities that had been identified and discussed by the WID in all of the various processes mentioned above. Where the WID board had also discussed or decided on near-term actions associated with a priority, we included those in the spreadsheet. The master spreadsheet is available as an electronic document, and provides the raw material for the suggested priorities described in this section.
6. We generated a set of suggested priorities (see Table 1 below), and then added desired outcomes and near-term actions using draft wording drawn from previous WID documents, statements and decisions (see Table 2 below). The material in these tables serves as a starting point around which the WID board could build their management plan and actions.
7. We also compared the list of WID priorities to relevant policy statements and goals in two related planning documents, namely the Whatcom County Comprehensive Plan (2016 update)[5] and the WRIA 1 Watershed Management Project's statement of goals (2008).[6] The goal statements in these two planning documents offer additional context for the Drayton WID's own priorities, and are shown alongside the suggested WID priorities in Appendix D.

2.2 Suggested priorities and desired outcomes for the Drayton WID

Each agreed strategic priority should ideally have one or more desired outcomes attached to it, which would then be used to:

- establish measurable goals against which progress can be measured and reported regularly, and
- identify actions, an implementation schedule, scope of work and resources needed for implementation

[2] See https://www.draytonwid.com/projects
[3] See https://www.draytonwid.com/minutes
[4] See Appendix A of this document (WID mapping report executive summary)
[5] Whatcom County Comprehensive Plan, adopted August 2016. http://wa-whatcomcounty.civicplus.com/DocumentCenter/View/21056
[6] WRIA1 Watershed Management Project (2008). *Goals of the WMP.* http://wria1project.whatcomcounty.org/About-The-Project/Goals-Of-WMP/17.aspx [accessed January 27, 2017]

Explanatory notes
The wording in Tables 1 and 2 below is based on statements drawn from WID meeting minutes, WID work session notes in the mapping report, the March 2017 WID planning session, and other WID documents.
The WID board will continue to review and update the goals and actions listed in Table 2, and will develop the detail of planned actions over time, as the board progresses towards a Comprehensive Plan for the WID.

Table 1. Suggested Drayton WID priorities, desired outcomes and near-term actions.
(Updated after Sep 2017 board meeting)

	Priority issue	Desired outcome(s): suggested text. See Table 2 for more detail on suggested actions	Near-term priority actions
1	Water quantity: water availability for agricultural use (irrigation, livestock, processing)	*Farmers in the Drayton WID have secure (legal) access to sufficient water for agricultural uses.*	· *(2017) Deep aquifer project – move beyond exploration to develop this as a potential new water source.* · *(2017) Pursue additional legal options to move water around – spreading, piping, water bank, transfers*
2	Water quality	*Agricultural activities in the Drayton WID do not cause water quality standards to be exceeded in surface water or groundwater bodies within the WID area.*	· *(2017) Continue with the ongoing water quality monitoring & response program*
3	Communication, outreach and education	*Internal: WID members are aware of and understand the WID's priority issues and they participate actively in WID planning and implementation of priority actions.* *External: Non-agricultural residents in the WID area, other external stakeholders and relevant bodies & agencies are aware of, understand and support the Drayton WID's priority actions.*	· *(2017) Develop a comprehensive plan for the Drayton WID* · *(2017) Coordinate with Ag Water Board to provide positive stories & correct information about agriculture*
iv	Agricultural field drainage	*Drainage infrastructure and ditches in the Drayton WID are actively and effectively maintained.*	
v	Flood management & protection	*Agricultural lands in the Drayton WID are protected from flooding at critical times in the growing season.*	
vi	Water flow processes; Habitats & species	*The Drayton WID's plans and actions help to protect and enhance water flow processes as well as fish and wildlife habitats in watersheds within the Drayton WID area.*	
vii	*Agricultural protection (Protecting the agricultural industry)*	*The Drayton WID's plans and actions contribute to the recognition, protection and strengthening of the agricultural base in the WID area*	

Notes on Table 1:
- *Wording: The suggested wording in these tables has been based on statements drawn from WID meeting minutes, WID work session notes in the mapping report and other WID documents.*
- *Ordering: Items numbered 1 through 3 are ordered by priority according to the results of the March 2017 WID planning session. Items (iv) to (vii) are in no particular order of priority but have been addressed in minutes of the WID board meetings.*
- *Priority actions column: At the March 2017 planning session, the actions currently in this column were the top priorities listed for 2017. The board may wish to add more near-term priority actions here, drawing from those listed in the right-hand column in Table 2.*

Table 2. Consolidated list of Drayton WID priorities, goals, and possible actions.

	Desired outcome(s):	Measurable goals	Actions
1	*Water quantity: Water for agricultural uses (irrigation, livestock, processing)* *(Updated after September 2017 board meeting)*		
	Farmers in the Drayton WID have secure (legal) access to sufficient supplies of water for agricultural uses.	*Goal statements:* *(a) Sufficient supply of water is available for agricultural uses.* *(b) All agricultural water use in the WID is secured through certificate, water lease or water supplier (such as water association or water bank).* *Progress could be measured by:* *(a) Extent of shortfall (if any) between water demand and water availability.* *(b) % of total agricultural water use in the WID that is secured through certificate, water lease or water supplier (such as water association).*	Recently completed or ongoing *i. Deep aquifer project: test drilling and studies were conducted to investigate this potential additional groundwater resource, working with Birch Bay Water & Sewer District (BBWSD) and other partner organizations and specialists through interlocal agreement (March 2017 notes)* *ii. Water conservation projects completed (March 2017 work session notes)* *iii. Tracked bills in the WA Legislature related to water supply and water rights and coordinated with AWB to respond as necessary (meeting minutes)* Priority actions for management plan *iv. Deep water aquifer project: continue work with BBWSD, move beyond exploration to develop this as a water supply option, possibly including water banking and/or mitigation for new water rights (March 2017 notes, 2016-2017 minutes)* *v. Coordinate with AWB and other WIDS to pursue additional options to secure sufficient agricultural water, such as water exchange or water banking, changes in place of use, water storage through aquifer recharge etc.* (3/2017 work session, 4/2017 meeting)* *vi. Expand hydrological analysis to include surface water, climate, and evapotranspiration, to assess current general water use and water availability and identify shortfalls – possibly coordinate with other WIDs on the analysis** *vii. Coordinate with Ag Water Board for actions related to water rights and for participation in the Water Supply Work Group (2/2017 meeting, 3/2017 work session)* *viii. Coordinate with AWB on the Drought Planning Task Force (1/2017)* *ix. Support & coordinate with Ag Water Board to communicate water rights concerns (noted from 3/2017 work session)* ** denotes actions that may need additional resources, and more detailed scope & description*

	Desired outcome(s):	Measurable goals	Actions
2	*Water quality (Updated after September 2017 board meeting)*		
	Agricultural activities in the Drayton WID do not cause water quality standards to be exceeded in surface water or groundwater bodies within the WID area.	*Goal statement:* *Relevant water quality standards are met for surface and groundwater within agricultural lands* *Progress could be measured by:* *Achievement of required water quality standards*	Recently completed or ongoing: *i. Implemented a water quality monitoring program to find and respond to hot spots and problems (March 2017 notes. Reported at regular WID board meetings).* *ii. Made contact with WID landowners to resolve water quality concerns that arose in the monitoring program (contacts reported at regular WID board meetings)* *iii. Water quality improvements by farmers contributed to the re-opening of the Drayton Harbor shellfish beds in 2016 (March 2017 notes).* *iv. Tracked the CAFO permitting process with regard to the potential effects on dairy farmers (ongoing)* Priority actions for management plan: *v. Continue with the ongoing water quality monitoring & response program (March 2017 notes).* *vi. Coordinate with other WIDs on funding for and implementation of source tracking of fecal pollution using DNA markers (6/2017, March 2017 work session)** *vii. Maintain a watching brief on installation of ZAPS technology for real-time monitoring of fecal coliforms/E. Coli in water, as Whatcom Conservation District & County Department of Health plan to install several ZAPS units in the area waterways. (2/2017)* *Additional actions that might be considered for inclusion here (from meeting discussions & other WID documents):* *viii. Encourage agricultural landowners in the WID to implement appropriate BMPs, with assistance from the Conservation District** *ix. Coordinate with other WIDs to adopt a consistent response strategy across the WIDs for addressing reports of questionable practices or consistently high fecal coliform test results (1/2016, 3/2016, 4/2016)* ** denotes actions that may need additional resources, and more detailed scope & description*

	Desired outcome(s):	Measurable goals	Actions
3	*Communication, outreach, education and reporting (Updated after September 2017 board meeting)*		
	Internal: WID members are aware of and understand the priority issues and participate actively in WID planning & implementation of priority actions.	Internal Progress could be measured by: - *Number of direct personal contacts to resolve concerns or raise awareness;* - *information shared (e.g. newsletters, website);* - *landowner concerns/priorities addressed;* - *feedback received (informal or through surveys)*	*Internal: The WID board will need to communicate with WID members and engage with them on agreed priority issues, and also to communicate with neighboring landowners, other stakeholders and relevant agencies living or working within the WID.* Recently completed or ongoing *i. Outreach: Set up the WID website www.draytonwid.com (2015)* *ii. Outreach: Sent letter to WID members to explain assessment rates, accomplishments and future needs (11/2015)* *iii. Outreach: Published Ag Water Board introductory story map with general information about the WIDs http://www.agwaterboard.com/storymap* *iv. Outreach: Published story map as part of Ag-Watershed Characterization and Mapping project http://arcg.is/29gspLX (10/ 2016)* *v. Outreach: Distributed newsletter summarizing WID activities (Sep 2016)* *vi. Comprehensive Plan: Hosted work session in 2016 to map and characterize priorities for the WID (Mapping Report produced with the Ag-Watershed Project team)* *vii. Comprehensive Plan: Participated in all-WID planning work session in March 2017* *viii. Education: Board members participated in meeting with other WIDs and Dairy Federation on fecal coliforms (2/2015) (did this include the Drayton WID also?)* Priority actions for management plan: *ix. Comprehensive Plan: Seek grant funding to develop and implement a comprehensive management plan* *x. Reporting: Establish a template for tracking and regular reporting of WID progress on priority issues, based on a set of simple indicators of progress.** *xi. Outreach: Continue to distribute newsletter to WID members summarizing WID progress.* ** denotes actions that may need additional resources, and more detailed scope & description*
	External: Non-agricultural residents and other stakeholders outside the WID are aware of, understand and support the Drayton WID's priority actions.	External Progress could be measured by: - *External contacts: information shared (e.g. newsletters, website);* - *feedback received (informal or through surveys);* *evidence of support for WID priorities (e.g. in media coverage)*	*External: While external communication and engagement could be coordinated through the Ag Water Board and Whatcom Family Farmers, specific information and inputs will be needed from the Drayton WID to support these efforts.* Recently completed or ongoing: *xii. Sponsored Whatcom Conservation District speaker series – Drayton program 2/2017 (Nov 2016)* *xiii. AWB (booth) on behalf of the WIDs at the Small Fruit Conference (Nov/Dec, 2016)* *xiv. Sponsored WSU Water Workshop (Feb 2017)* *xv. AWB submitted comments on County Critical Areas Ordinance Update (4/ 2016).* *xvi. AWB provided feedback on Whatcom Conservation District's 2017 work plan (9/2016, 10/2016).* *xvii. Coordinated with AWB, Dairy Federation and Whatcom Family Farmers for active discussions with the Lummi Nation regarding water issues, which culminated in the development of the Portage Bay Partnership in 2017. (3/2017 work session)* *xviii. Tracked bills in the WA Legislature related to water supply and water rights and coordinated with AWB to respond as necessary (meeting minutes)* Priority actions for management plan: *xix. Support Ag Water Board's work with key partners to relate positive stories about agriculture such as what farmers are doing to benefit habitat and water quality to stakeholders, relevant bodies and agencies, and media (March 20th work session notes).* *xx. Coordinate with other WIDs to help members build skills for effective engagement and communication with stakeholders (3/2017 work session).*

	Desired outcome(s):	Measurable goals	Actions
iv	*Agricultural field drainage (Updated after September 2017 board meeting)*		
	Drainage infrastructure and ditches in the Drayton WID are actively and effectively maintained.	*Goal statement (a):* *Regular, scheduled drainage maintenance in the Drayton WID area occurs under programmatic permits, in collaboration with DID#2 and DID#7, with mitigation as required and using approved Best Management Practices.* *Progress could be measured by:* *% of agricultural land requiring field drainage in the Drayton WID:* · *that is covered by programmatic permits for drainage maintenance;* · *where drainage infrastructure and ditches have been maintained and repaired as needed.*	Recently completed or ongoing: *i. Identified priority drainage problem areas and sites needing maintenance for Ag-Watershed Characterization and Mapping report (Feb 2016 work session) – see agricultural enhancement tables in Appendix B, also Table 4 and Figure 7 in this Preliminary Plan.* Priority actions for management plan: *ii. Proactively identify locations for mitigation sites and mitigation actions (e.g. culvert replacement, riparian vegetation) to be addressed in programmatic 5-year drainage permits, that could also contribute to advancing watershed & habitat priorities (see watershed enhancement tables in Appendix B) ** *iii. Coordinate with Whatcom County on prioritizing ditch maintenance activities (11/2015, 12/2015, 3/2016, 11/2016)* **denotes actions that may need additional resources, and more detailed scope & description*
		Goal statement(b): *Ad hoc actions (such as beaver management or sediment removal after a storm) and/or emergency repairs to drainage infrastructure are completed in a timely manner, in collaboration with DID#2 and DID#7 and Whatcom County.* *Progress could be measured by:* *Number of ad hoc emergency repairs/actions that are completed in a year, compared to the number reported as needing attention.*	Recently completed or ongoing: Priority actions for management plan: *Additional actions that might be considered for inclusion here (from meeting discussions & other WID documents):* *iv. Document the specific procedures for responding to situations requiring ad hoc or emergency actions. Include these procedures in the management plan and in WID communications/website.*

	Desired outcome(s):	Measurable goals	Actions
v	*Flood management & protection (Updated after September 2017 board meeting)*		
	Agricultural lands in the Drayton WID are protected from flooding at critical times in the growing season.	*Goal statement (a):* *Regular, scheduled maintenance is completed for flood protection infrastructure in the Drayton WID area.* *Progress could be measured by:* *Number of projects, repairs or actions that are completed in a year, compared to the number reported as needing attention.*	Recently completed or ongoing: *i. Identified flood management and dike maintenance priority actions as part of Ag-Watershed Characterization and Mapping work session in February 2016 (see agricultural enhancement tables in Appendix B, also Table 4 and Figure 7 in this Preliminary Plan).* Priority actions for management plan: *ii. Review and update priority actions identified at the February 2016 work session (see list in Table 4 and map in Figure 7 of this Preliminary Plan. Specific concerns include flooding on Valley View Road (4/2016) and Old Highway 99 as a result of beaver activity*
		Goal statement (b): *Ad hoc or emergency repairs to flood protection infrastructure are completed in a timely manner, in collaboration with Whatcom County.* *Progress could be measured by:* *Number of ad hoc emergency repairs that are completed in a year, compared to the number reported as needing attention.*	Recently completed or ongoing: Priority actions for management plan:

	Desired outcome(s):	Measurable goals	Actions
vii	*Water flow processes; Habitats & species (Updated after September 2017 board meeting)*		
	The Drayton WID's plans and actions help to protect and enhance water flow processes and fish and wildlife habitats in the watersheds within the WID area	*Goal statement:* *Water flow processes (surface storage, discharge, recharge, delivery) are enhanced or protected as necessary in areas that are important for the watershed (see Figures 14 and 15 in the WID mapping report: also included in Appendix C of this document).* *Progress could be measured by:* *Some options for measuring progress:* - *Status of water flow process degradation (H, MH, M, L) in assessment units within the Drayton WID area (see Fig 14 in Appendix C).* - *% effective shade cover along fish-bearing streams and ditches.* - *Acres of wetland or wildlife habitat enhanced, restored and/or protected* - *Miles of stream length made accessible through removal of fish barriers*	Recently completed or ongoing: *i. Watershed assessment for the Ag-Watershed Project (Feb 2016) identified priority areas where water flow processes – especially storage and discharge - could be enhanced through wetlands, ground water recharge and planting of riparian vegetation (see watershed characterization tables in Appendix B of this Preliminary Plan).* Priority actions for management plan: *ii. Review possible actions to enhance or protect water flow processes in specific locations within the Drayton WID area, as listed in the watershed characterization tables prepared during the WID work session in February 2016 (see tables in Appendix B of this Preliminary Plan).** · *Suggested actions in specific parts of the WID include, for example, enhancing surface water storage, reducing or preventing additional impervious cover, protecting and/or restoring riparian and forest cover, reducing subsurface drainage rates.* *iii. Proactively identify locations for mitigation sites and mitigation actions (e.g. culvert replacement, riparian vegetation) to be addressed in programmatic 5-year drainage permits, that could also contribute to advancing watershed & habitat priorities (see watershed enhancement tables in Appendix B) ** *iv. Riparian planting (South Fork Dakota Creek just downstream from Sunrise Road was noted as a priority area at the meeting of 4/2016)* ** denotes actions that may need additional resources & more detailed scope & description*

	Desired outcome(s):	Measurable goals	Actions
viii	*Agricultural protection (Protecting the agricultural industry) (Updated after September 2017 board meeting)*		
	Note that WID actions could contribute to this priority issue, but there are also external factors influencing it, such as land prices, agricultural markets, policies etc.		
	The Drayton WID's plans and actions contribute to the recognition, protection and strengthening of the agricultural base in the WID area.	*Goal statement (a):* *Suggestions from WID board for goal statements that might apply here to indicate recognition, protection & strength of agriculture?* *Progress could be measured by:* *An example might be the County Council resolution on preserving 100,000 acres for the ag land base, recognizing the importance of agriculture & associated industries for the local economy.*	Recently completed or ongoing: Priority actions for management plan: *i. Pursue options to provide secure water supply for agricultural users, in order to safeguard agricultural production in the WID area over the long term.* *ii. Coordinate with Whatcom Family Farmers to address legal challenges and preserve "one voice outreach" on behalf of agriculture (from March 2017 work session)*
		Goal statement (b) *Land use conflicts with neighboring non-agricultural landowners are reduced.* *Progress could be measured by:* *Number of complaints received from non-agricultural landowners by the WID or by Whatcom County.*	Recently completed or ongoing: Priority actions for management plan: *iii. engage and communicate with non-ag landowners in the WID area about WID priorities and programs, normal farming operations, right-to-farm etc. (include specific actions in the communication strategy)** ** denotes actions that may need additional resources, and more detailed scope & description*
		Goal statement (c): *Important agricultural land in the WID is protected from conversion through appropriate zoning and/or voluntary agricultural conservation easements.* *Progress could be measured by:* *Acres of land in the Drayton WID protected by voluntary agricultural conservation easements*	*"Preserving the land base" is a stated priority from the mapping report (2016), and the map of Agricultural Priority Areas in Appendix C shows Rural Study Areas (important agricultural land that is vulnerable to conversion) overlapping with the WID boundary. However, the board meeting minutes do not show any detailed discussion of this issue.* Recently completed or ongoing: Priority actions for management plan:

3 GENERAL OVERVIEW OF THE DRAYTON WID

Explanatory note
The following text describing the Drayton watershed and WID area is copied from the 2016 characterization & mapping report, with some modifications and additions. Additional sources are cited in footnotes.

The purpose of this section is to briefly inform readers about the history and characteristics of the Drayton WID area, provide summary descriptions of the sub-watersheds and agricultural activities, and introduce some of the issues that have informed the WID's stated priorities for management.

- In the comprehensive management plan, this overview section would be more detailed, with additional maps and tables providing a synthesis of readily available information on land use, cropping patterns, hydrology, water quality.
- In the comprehensive management plan, the sections on baseline conditions would be expanded, to include results of new analyses and possibly new field measurements also.

Additional background information about the Drayton WID can be found online:

- WID website http://www.draytonwid.com/
- Agriculture-Watershed Characterization & Mapping Report for the Drayton WID (2016) <download here>
- Story map showing results of WID work sessions and the Agriculture-Watershed Characterization & Mapping work (2016) http://arcg.is/29qspLX
- Ag Water Board introductory story map with general information about the WIDs http://www.agwaterboard.com/storymap

3.1 Location and hydrology

The Drayton Watershed Improvement District (see location map in Figure 1) is located in the northern coastal lowland area of Whatcom County within Water Resource Inventory Area 1 (WRIA 1). The WID area includes portions of the Dakota, California, and Haynie Creek Drainages. Flow through these creeks is generally to the northwest, entering Drayton Harbor, which contains active shellfish farming areas. Blaine (pop. 5,000), the closest city, lies to the northwest on the coast.

Most of the WID area is underlain by the Sumas-Blaine aquifer which is part of the larger Abbotsford-Sumas Aquifer that extends into British Columbia, Canada. The aquifer exhibits shallow depth to water and limited thickness. These factors and the region's heavy rainfall from October to March combine to make groundwater recharge fairly rapid but also to make the groundwater in the area vulnerable to contamination from surface pollution.[7] Wells that exceed the standard for nitrate occur primarily to the east of the Drayton WID. Although numerous wells between the Drayton WID boundary and the City of Lynden have high levels of nitrate, there are few wells within the Drayton WID area that show high concentrations.[8]

The WID is an irrigation district which was formed in 2014 under Chapter 87.03 RCW by the local agricultural community in order to have a local organization that could implement actions and engage in agreements with state and federal agencies. The total calculated area within the present WID boundary

[7] Carey B. & Cummings R. (2013). *Sumas-Blaine Aquifer Nitrate Contamination Summary*. Washington State Department of Ecology Publication No. 12.03.026. https://fortress.wa.gov/ecy/publications/documents/1203026.pdf [last accessed February 5, 2017]

[8] WA Department of Ecology, 2012. *Focus on Groundwater Quality in Whatcom County, June 2012. Publication No. 12-03-0005* https://fortress.wa.gov/ecy/publications/documents/1203005.pdf [last accessed August 3, 2017]

as shown in Figure 3 is 7,385 acres. Within this boundary, the area of land currently on the Drayton WID assessment roll is 7,397 acres.[9] The WID includes all land parcels within the WID boundary that are at least 2.5 acres except for tax-exempt parcels and those enrolled in the Agricultural Open Space taxation program (see map in Figure 4). The WID currently represents 140 property owners with parcel acreages ranging from 4.5 acres to 107 acres.

The WID contains two other special purpose districts within its boundaries, whose primary purpose is to improve and maintain drainage of agricultural land within those portions of the WID. These are Drainage Improvement District No. 7 and Drainage Improvement District No. 2 (see Figure 6).

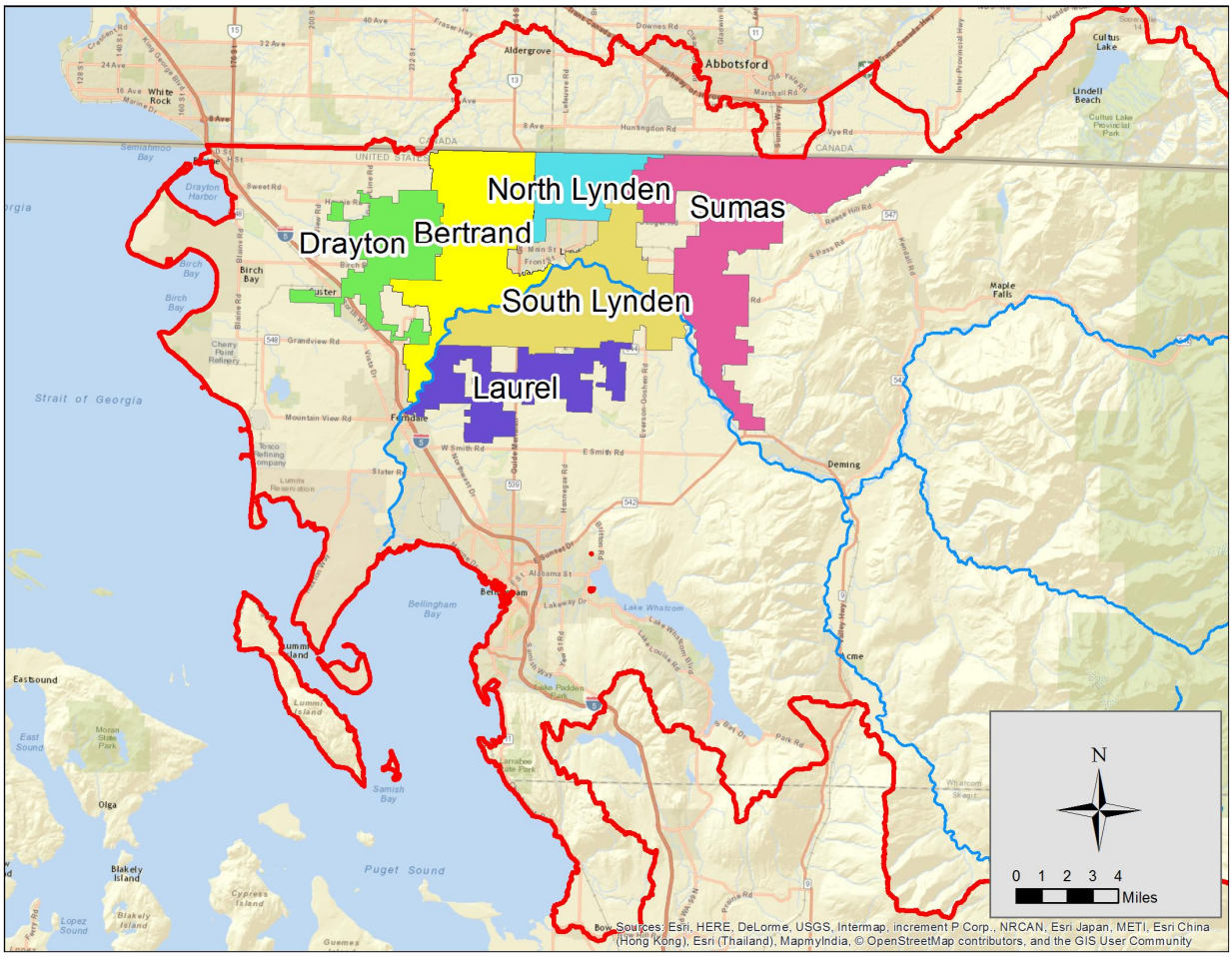


Figure 1. Map showing location of the Drayton WID, with Water Resource Inventory Area 1 outlined in red. Reproduced from the Drayton WID mapping report (2016).

[9] Henry Bierlink, Ag Water Board. May, 2017. The total number of acres on the assessment roll can vary somewhat over time as assessed parcels are consolidated or segregated. In addition, some currently enrolled acres are located just outside the WID's geographic boundary.

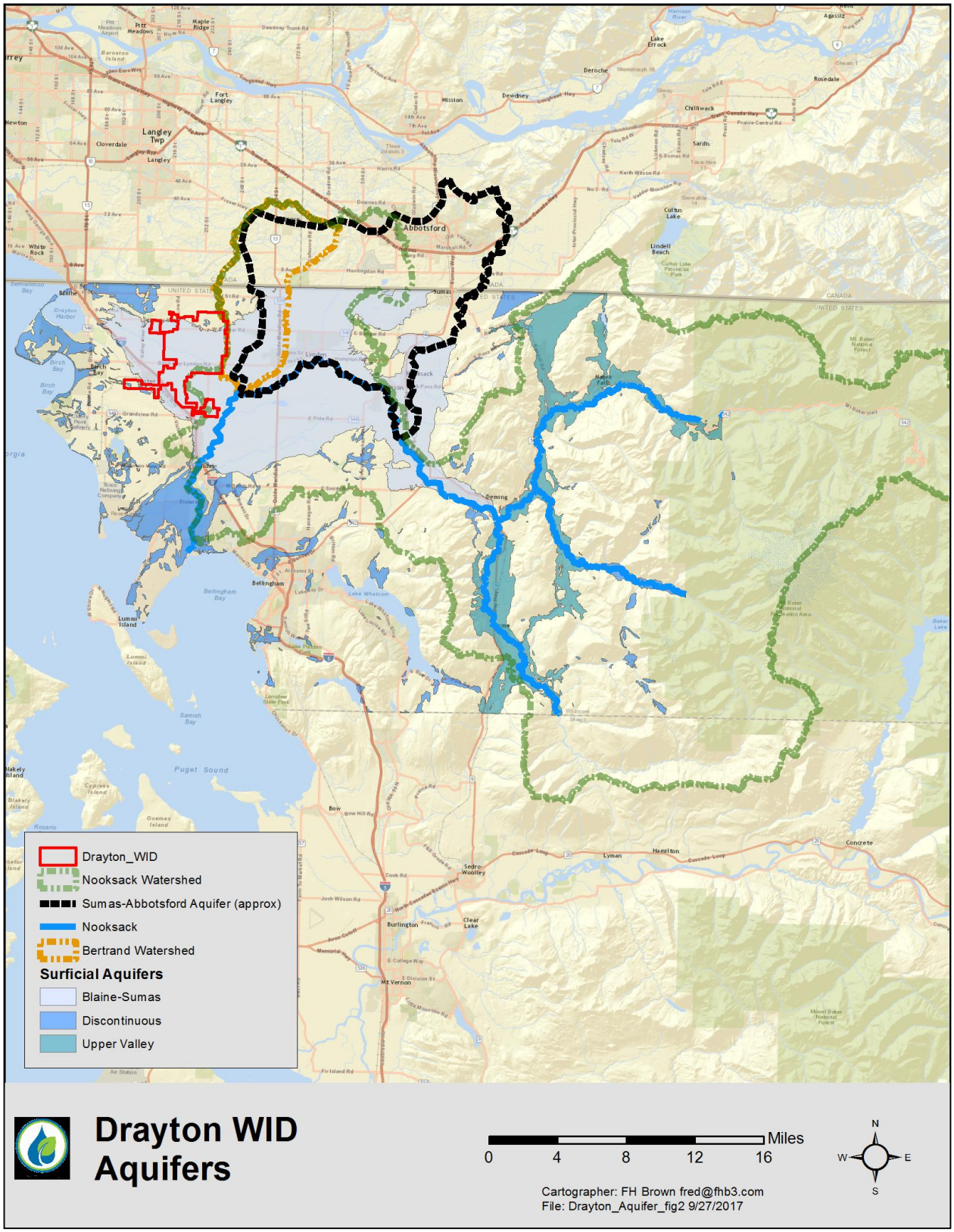


Figure 2. Map showing aquifers in the vicinity of the Drayton WID. Data from WA Dept. of Ecology.

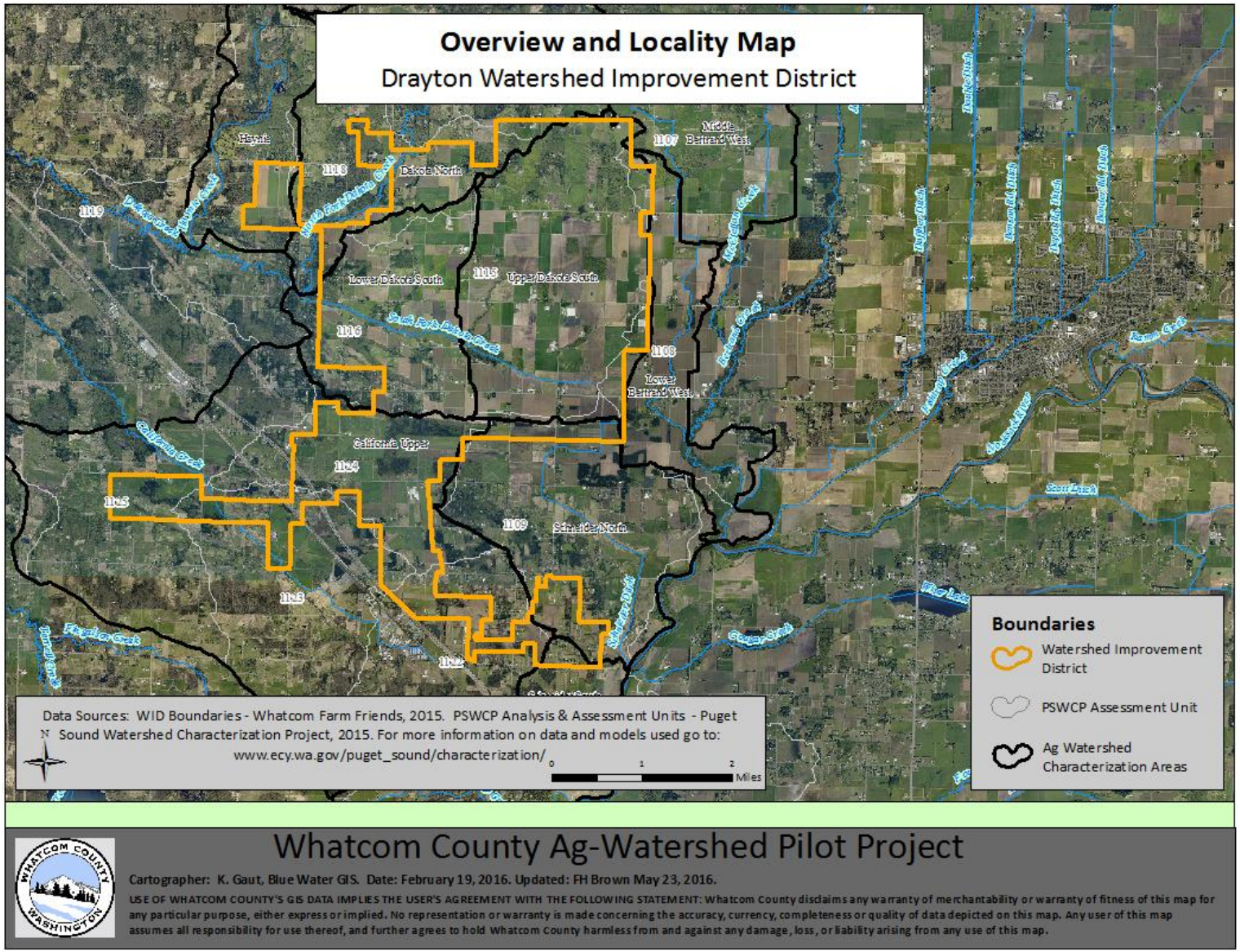


Figure 3. Drayton WID overview map. Reproduced from the Drayton WID mapping report (2016).

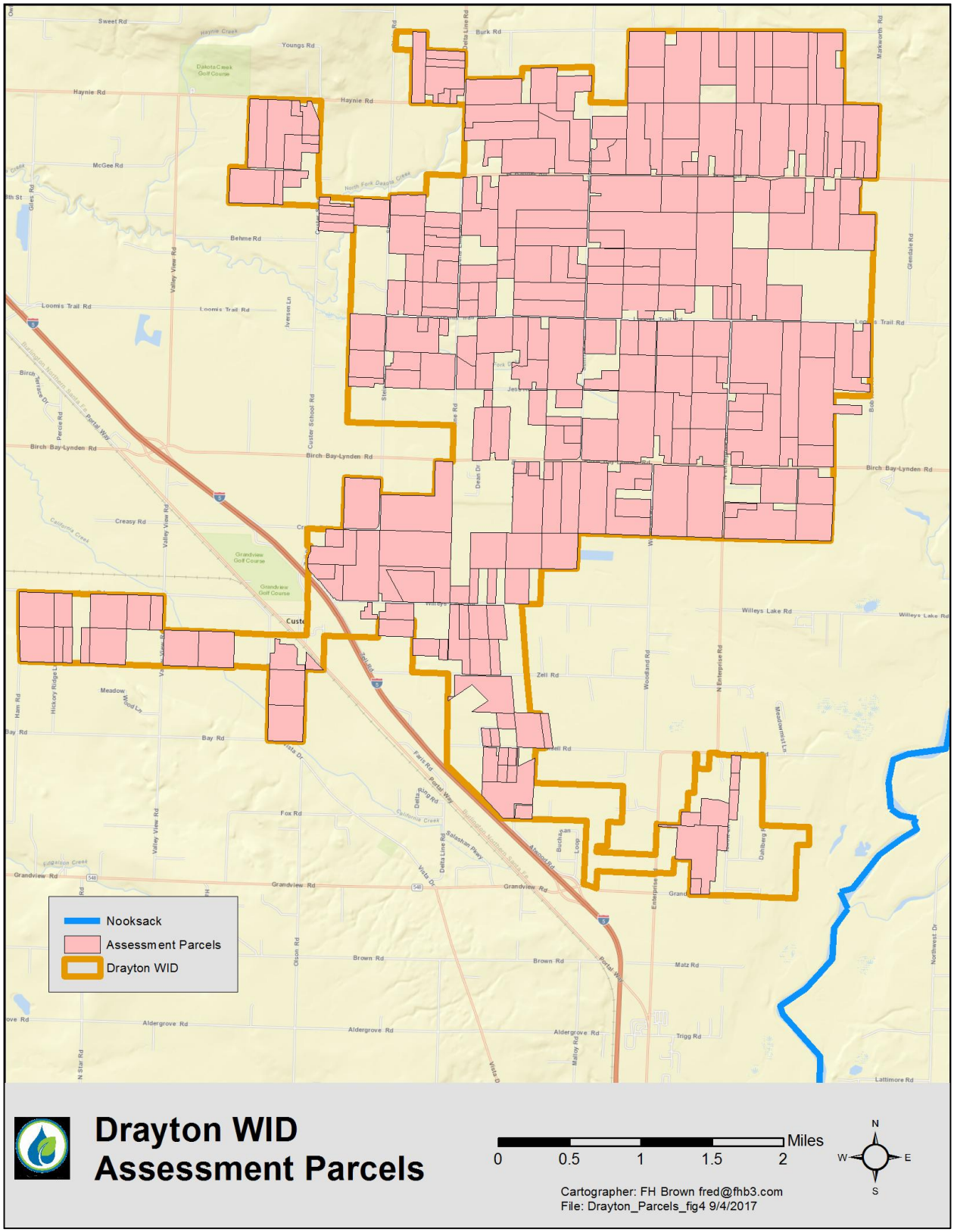


Figure 4. Map of parcels included in the Drayton WID assessment roll (May 2017). Data provided by Ag Water Board.

3.2 Historic conditions in the Drayton WID area

Explanatory note
Understanding the historic conditions in the watershed helps us to understand how the watershed system has changed over time, before and after European settlement of the area. This informs the discussion about what actions are needed for both agriculture and watersheds, which actions are practical and feasible in the landscape given the topography, soils and hydrology, and where specific actions would be most effective in achieving both agricultural and watershed priorities.

Before European settlement, the land within the Drayton WID was part of the Semiahmoo Tribe's territory which extended around Boundary Bay, Semiahmoo Bay, Drayton Harbor, and Birch Bay, and, on the US side, reached inland to the headwaters of Dakota and California Creeks, and included Lake Terrell.[10,11] Like other Straits Salish tribes, the Semiahmoo fished with reef nets. Salmon and sturgeon were the staples of their diet which they supplemented with roots, bulbs, berries and fruit gathered by the women. They also hunted to a lesser degree, primarily for waterfowl."[12,13]

Sources used for this report describe the Semiahmoo people dwelling, fishing, gathering, and hunting along the coast and do not shed light on the condition of the land inland in the Drayton WID area. However, a few places within the Drayton Harbor watershed were used and named by the Nooksack tribe, and helpful descriptions of these places are available.

A trading partner of the Semiahmoo, the Nooksack Tribe, had major settlements to the east near the present cities of Lynden and Everson, and at the forks of the Nooksack River. Many well-defined trails facilitated their trade to the south and west with the Semiahmoo, Lummi, and Skagit tribes as well as to the north with the Sumas, Chilliwack, and Matsqua bands, and The Hudson's Bay Company at Fort Langley.[14,15]

Nooksack Place Names (Richardson and Galloway, 2011) provides translations and descriptions of places within the area of the Drayton WID that give us a sense of what these areas were like before European Settlement. Dakota Creek was named Kw'ol7óxwem which means dog salmon place to get. The authors explain, "Dakota Creek and possibly California Creek were fished for salmon by the Nooksack in the late 19th and early 20th centuries."[16] Qel7á7eliy is the name given to a tributary of Dakota Creek which the

[10] Brown, J. 2014. "Semiahmoo People," *Surrey History.* Available at: http://www.surreyhistory.ca/camps.html [last accessed August 22, 2017]
[11] Richardson, A., B. Galloway, 2011. *Nooksack Place Names. Geography, Culture and Language.* Vancouver, CA: UBC Press
[12] Dougherty, P. 2009. "Semiahmoo People" History Link.org http://www.historylink.org/File/9123 [last accessed August 22, 2017]
[13] Brown, J. 2014. "Semiahmoo People," *Surrey History.* Available at: http://www.surreyhistory.ca/camps.html [last accessed August 22, 2017]
[14] Jeffcott, P R. 1949. *Nooksack Tales and Trails*. (Ferndale: Sedro-Woolley Courier Times), cited in Tremaine, D.G. 1975. *Indian & Pioneer Settlement of the Nooksack Lowland, Washington to 1890. Occasional Paper #4.* Center for Pacific Northwest Studies, Western Washington State College.
[15] Oakley, J. 2004. "Construction begins on the Whatcom Trail in September 1857" *History Link.org* http://www.historylink.org/File/7112
[16] Richardson, 1974. "Traditional Fisheries and Traditional Villages, Camps, and Fishing Sites of the Nooksack Indians." In *Nooksack Tribal Planning Project: Phase I Report*. Deming, WA: Nooksack Indian Tribe. Cited in

Boundary Survey maps show crossing present-day Loomis Trail Road 0.2 mile east of Sunrise Road. The authors report, "Extensive beaver workings were noted on the main creek near this tributary."[17] California Creek was named Ti'eqx̲, which could be a Semiahmoo name. Richardson and Galloway offer "soggy" and "spread all around" as word roots. The book further explains the headwaters of California Creek are "in bogs of the Custer area extending to within two miles of the Nooksack River" and that Nooksack people came to this area to harvest cranberries, blueberries, and swamp tea in these "extensive bogs."[18]

The General Land Office cadastral surveys of 1859 and 1872 give more detailed descriptions of the water features, soils, and timber in the WID area. Isaac Smith and his team surveyed the southernmost area of what is now the Drayton WID in 1859. Smith's notes mention low and "swampy" land,[19] "swamp,"[20] "skunk cabbage swamp," "swamp of hardhack and willows,"[21] and, closer to Schneider ditch, an "impassable swamp."[22] His general comment on the northern boundary of Township 39N, Range 2E (roughly from Wiser Lake to I5) was "The land over which this line passes is for the greater part worthless until thoroughly drained."[23]

For this same area Smith chronicles the "timber" and "undergrowth" plant species. The most frequently mentioned tree is hemlock, followed by cedar and fir, with alder, spruce, and maple somewhat less frequently noted.[24] The most commonly noted understory plants were alder, crabapple, vine maple, and willow, followed by hemlock. Cherry, briers, and a plant they called "tasselwood," were the least commonly noted.

Richardson, A., B. Galloway, 2011. *Nooksack Place Names. Geography, Culture and Language.* Vancouver, CA: UBC Press

[17] Custer, H. 1858a. "Report of Henry Custer, Assistant, of His Reconnaissance of the Country between Camp Simiahmoo and Sumass Prairie. Cam Simiahmoo, Apriol 7, 1858." Unpublished field report of the United States Northwest Boundary Survey, US National Archives, RG76, E 196. Cited in Richardson, A., B. Galloway, 2011. *Nooksack Place Names. Geography, Culture and Language.* Vancouver, CA: UBC Press

[18] Richardson, A., B. Galloway, 2011. *Nooksack Place Names. Geography, Culture and Language.* Vancouver, CA: UBC Press

[19] T39N R2E traveling west along northern boundary of section 6 (Harksell Rd near I5). From Smith, I.W. 1859. *Field notes of the exterior lines of townships no. 39 N ranges 2E & 1E, 40N R1W & north boundary of township 38N R1E & 39N R1W*. General Land Office Cadastral Survey. page 611. https://www.blm.gov/or/landrecords/survey/ [last accessed August 24, 2017]

[20] T39N, R1&2E between sections 1 and 6 (between Harksell Rd. and Grandview) and T39N R2E northern boundary of section 5 (Harksell Rd near Enterprise Rd). From Smith, I.W. 1859. *Field notes of the exterior lines of townships no. 39 N ranges 2E & 1E, 40N R1W & north boundary of township 38N R1E & 39N R1W*. General Land Office Cadastral Survey. pps. 609 and 611. https://www.blm.gov/or/landrecords/survey/ [last accessed August 24, 2017]

[21] T39N, R2E traveling west on the northern boundary of section 4 (Harksell Rd. in area of Dahlberg Rd.) From Smith, I.W. 1859. *Field notes of the exterior lines of townships no. 39 N ranges 2E & 1E, 40N R1W & north boundary of township 38N R1E & 39N R1W*. General Land Office Cadastral Survey. page 610. https://www.blm.gov/or/landrecords/survey/ [last accessed August 24, 2017]

[22] T39N, R4E. From Smith, I.W. 1859. *Field notes of the exterior lines of townships no. 39 N ranges 2E & 1E, 40N R1W & north boundary of township 38N R1E & 39N R1W*. General Land Office Cadastral Survey. page 609. https://www.blm.gov/or/landrecords/survey/ [last accessed August 24, 2017]

[23] Smith, I.W. 1859. *Field notes of the exterior lines of townships no. 39 N ranges 2E & 1E, 40N R1W & north boundary of township 38N R1E & 39N R1W*. General Land Office Cadastral Survey. page 613. https://www.blm.gov/or/landrecords/survey/ [last accessed August 24, 2017]

[24] pps 609-611.

In 1872, John A. Cornelius and his team surveyed more of the area. They walked the lines between the sections of Ranges 1 and 2 in Township 40 (the area from Guide Meridian west to Birch Bay and from Bay Rd and Harksell Rd north to H Street), covering a great deal of the land occupied by the Drayton WID.

In the area of the WID within Township 40N, Range 1E (the area north of Bay Rd and west of the Delta Line Road) Cornelius noted numerous wet areas. "Swampy," "swampy bottom," "marsh" "wet bottom," and "wet hemlock bottom" are all descriptions used here. The tree species noted most frequently in this area is fir, followed by cedar and hemlock. Alder and spruce are least frequently noted. In a couple of locations, he stated the trees had been burned. The most frequently noted understory plant was willow, followed by salmonberry, and fern. His general description of Township 40, Range 1E reads,

"The land in this township is generally of very good quality and would be comparatively easy to clear for purposes of agriculture; the heavy timber having been destroyed and to a considerable extent consumed by fires, which appear to have raged with great violence over this section of country.

In the eastern and central portions of the township there are several fine fresh water marshes. The two creeks emptying into Semiahmoo Bay are navigable for small craft for a distance of about a mile and a half from their mouths."[25]

The area of the WID within Township 40, Range 2E (north of Harksell Rd. and east of Delta Line Rd.) appears to have been dryer though Cornelius does note a "pine swamp," a "pine and cedar swamp," and a "beaver swamp" near the headwaters of Dakota Creek (near Bob Hall, Birch Bay Lynden, and Sunrise Rds). Fir and cedar trees dominated here, followed by hemlock and spruce. Birch, cottonwood, and pine trees were noted the least. Burned trees are frequently mentioned here. Cornelius does not appear to have written a general description of Township 40N, R2E but he did report widespread fires in his explanation of the team's unsuccessful search for the corner of Township 41N, Ranges 1 and 2 (at the intersection of H Street and Delta Line Rd): "Although I find blazes on the standard parallel yet I can find no traces of the corner . . . the whole country having been burned over several times and all traces of the corner destroyed."[26] Cornelius did not note understory plants in many of the survey notes for this area. In the few notes he made on the subject, vine maple was mentioned most frequently, followed by willow, spruce, and devil's club.

General Land Office survey maps from between 1850 and 1890 may be found in the Drainage Management Plan for DID #7 (which overlaps the southern part of the WID around Custer and the Schneider Ditch area). These maps, like the survey notes, show numerous wet areas.[27]

An account of California Creek in the 1870s describes the land along the creek and some of the wildlife. In "Early History of California Creek," published in *The Blaine Journal* in 1906, E. Holtzheimer writes, "At

[25]Cornelius, J.A, 1872. *Field notes east boundary and subdivisional lines township 40N R1 east by I.A. Cornelius, Dep. Sur. 1872.* General Land Office Cadastral Survey page 280. https://www.blm.gov/or/landrecords/ [last accessed August 24, 2017]

[26] Cornelius, J.A, 1872. *Field notes east boundary and subdivisional lines township 40N R1 east by I.A. Cornelius, Dep. Sur. 1872.* General Land Office Cadastral Survey. page 244) https://www.blm.gov/or/landrecords/ [last accessed August 24, 2017]

[27] Drainage Irrigation District #7, Whatcom Conservation District, Whatcom County Public Works. *Whatcom County Drainage Improvement District #7 Drainage Management Plan.* Support provided by Centennial Clean Water Fund under authority of the Washington State Department of Ecology. Available at: http://whatcomcd.org/sites/default/files/ag_drainage/dmps/DID%235_DMP.pdf [last accessed August 25, 2017]

the time I speak of, the lands on the bank of the creek were not covered with the dense jungle of second growth fir as at present. The country was fairly open and intersected by numberless deer trails. Game, being abundant, offered sport and supplied our wants, and the upper creek was the home of the beaver and mink."[28]

The upper Drayton and California Creek watersheds are under-represented in historical records. There are few accounts to help us understand the transition to agriculture. However, we know that in the lowlands of Whatcom County, European settlers began to clear and drain the land in the mid to late 1800s.[29] And by 1880 agricultural settlements were distributed throughout the Whatcom County region with a relatively large number of settlers in Ferndale, Lynden, and Everson.[30] The first agricultural efforts were simple subsistence farming, but by 1885 the settlers began large scale clearing of the land to support market agriculture.

E. Holtzheimer's "Early History of California Creek" suggests that agriculture and clearing timber were widespread endeavors among settlers in the California Creek area in the 1870s. Holtzheimer describes the regular arrival of mail as follows, "…the day on which the mail steamer was due - or failed to arrive - soon became a regular holiday to old settlers. Every business and work was dismissed and postponed; from every creek, nook and corner, in rain or in sunshine, boats laden with produce and shingles - that constituted legal tender - could be seen approaching the spit." [31]

In Whatcom County as a whole between 1900 and World War II, 52 different varieties of crop are known to have been grown including hops, flax, bulb flowers, strawberries, blueberries, beets (the primary source of sugar at the time), cabbage, and potatoes. Poultry and dairy cows were also extensively raised.[32] Wet areas, such as the ones described by the cadastral land surveys of the Drayton WID area, were often used to raise beef or dairy cows because they could be pastured most of the year and moved to high pastures to escape seasonal flooding.[33]

The Nooksack valley's forests and wetlands were transformed within the first few decades of settlement. By the beginning of the 20th century, most of the native forest had been burned or logged, and most wetlands had been diked and ditched. By 1938, the burned or logged lands in the lower Nooksack mainstem were almost entirely converted to agriculture.[34]

---

[28] Holtzheimer, E., 1906. Early History of California Creek. *The Blaine Journal,* March 2. http://wagenweb.org/whatcom/townhistories/califcreek.htm [last accessed August 22, 2017]

[29] Luginbill, T. 2017 [personal communication February 21, 2017] and Perry, R. 2017 [personal communication February 14, 2017]

[30] Tremaine, D.G. 1975. *Indian & Pioneer Settlement of the Nooksack Lowland, Washington to 1890. Occasional Paper #4.* Center for Pacific Northwest Studies, Western Washington State College.

[31] Holtzheimer, E., 1906. Early History of California Creek. *The Blaine Journal,* March 2. http://wagenweb.org/whatcom/townhistories/califcreek.htm [last accessed August 22, 2017]

[32] Luginbill, T. 2017 [personal communication February 21, 2017].

[33] Luginbill, T. 2017 [personal communication August 29, 2017]

[34] Collins, B. D., and A. J. Sheikh, 2004. Historical riverine dynamics and habitats of the Nooksack River; May 2003 (revised August 2004). Deming, WA: Nooksack Indian Tribe

3.3 Soils and land use

Based on the soil capability, the majority of the Drayton WID area has been classified by the USDA Natural Resources Conservation Service as "Prime farmland" or "Prime if managed"[35] with a significant portion of the area being "Prime if drained" (see Table 3). The map in Figure 5 shows prime soils on those parcels that are included in the Drayton WID assessment roll as at May 2017. A map of all prime soils in the Drayton WID is included in Appendix C of this document.

Land use in the local area is diverse, including agricultural, rural, commercial and low-density residential areas. Most of the land in the upper and lower Dakota Creek South watersheds is designated as Agricultural District of Whatcom County (AG zoning).[36] Much of the land in the Dakota North Fork, Haynie, California Upper and Schneider North watersheds is zoned R5 and is also identified as Rural Study Areas, indicating land of high agricultural value that is vulnerable to conversion (see Agriculture Priority Areas map in Appendix C). Agriculture includes a mix of dairy hay, dairy corn, berry crops and potatoes.[37] Maps of agricultural land use inventory and important agricultural land in the Drayton WID are included in Appendix C.

Table 3. Prime soils within the Drayton WID area. Data from SSURGO, NRCS (2015).

Prime Farmland Category	Description	Acres included in Drayton WID assessment roll (May 2017)[38]
0	Not prime farmland	52.9
1	All areas are prime farmland	2358.9
2	Prime if drained	2083.4
4	Prime if irrigated	77.7
8	Prime if subsoiled	2689.0
30	Farmland of Statewide Importance[39]	186.3
	Acres in WID assessment roll	*7396.1*

[35] See definitions in the National Soil Survey Handbook: NSSH Part 622

[36] Whatcom County Title 20 zoning maps http://www.whatcomcounty.us/822/Zoning-Maps [last accessed May 9, 2017]

[37] The story map for the Ag Water Board contains maps and graphs of crop acreages in each WID. See http://www.agwaterboard.com/storymap. Also informed by participant comments in the Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District. Whatcom County Planning & Development Services, August 2016. Available at: http://draytonwid.com/ [Alternative download <here>]

[38] Assessment roll data provided by Henry Bierlink in May 2017. The slight difference in total acres assessed is due to changes to the assessment roll as assessed parcels are consolidated or segregated.

[39] Farmland of Statewide Importance is important for the production of food, feed, fiber, forage, and oilseed crops. These lands include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmland if conditions are favorable.

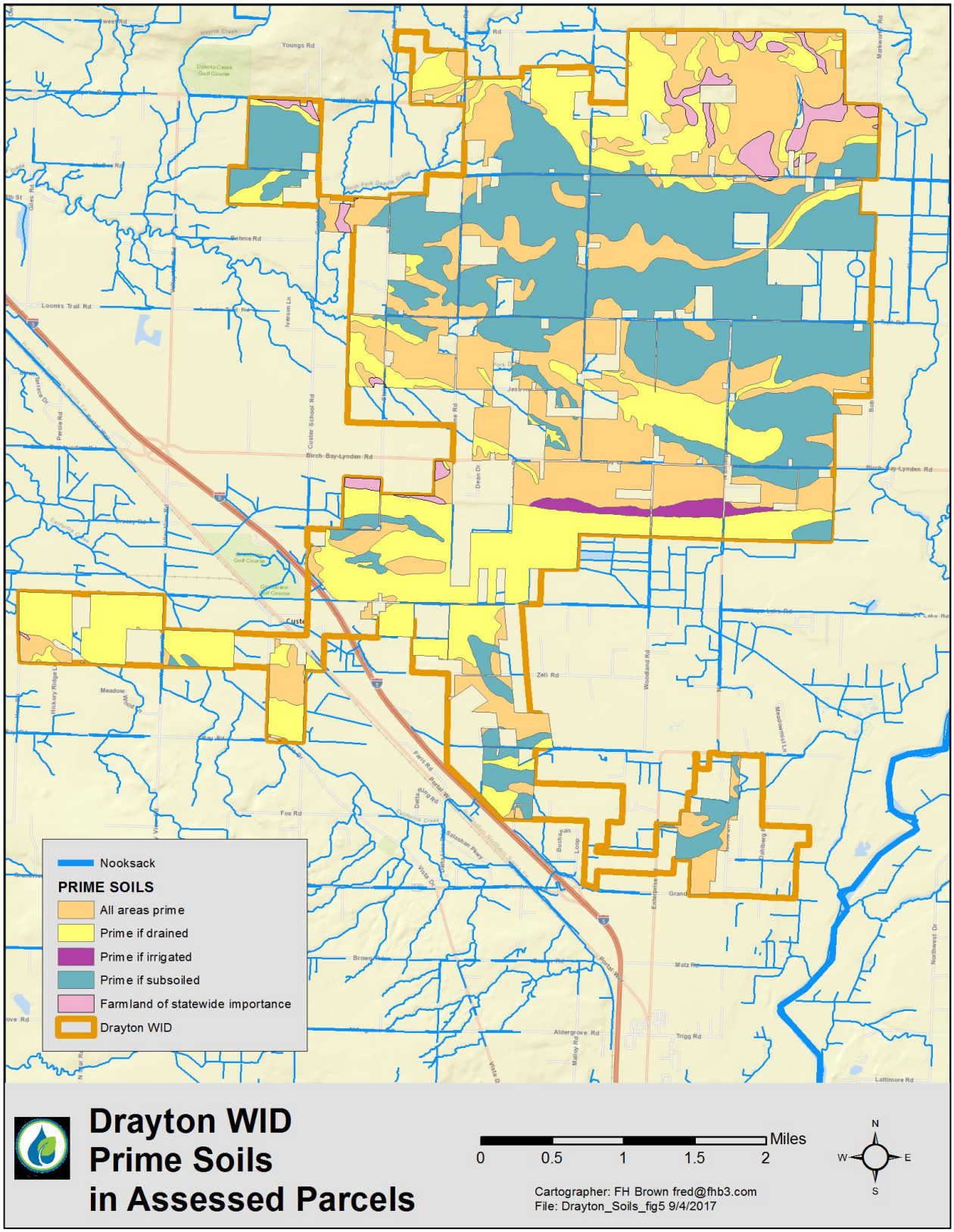


Figure 5. Map showing prime soils in parcels that are currently on the Drayton WID assessment roll. Soil data from SSURGO (NRCS). Parcel data from Ag Water Board.

3.4 Water quantity, water use and water availability

The locations of existing groundwater and surface water rights within the Drayton WID are shown in the water rights map in Appendix C.[40] Many new applications and change applications are also on record for the Drayton WID area and are shown on this map.

Access to legal irrigation water is a key priority (39 new applications have been filed in the WID area). Dakota Creek and California Creek are closed year-round to further appropriations unless mitigated. Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[41] Access to larger volumes of groundwater is constrained due to local hydrogeological characteristics. Two Group A public water suppliers do not have adequate water rights in proper locations to meet projected future demand.[42]

Two reports are useful to understanding the water use in this area: *Quantification of Agricultural Irrigation Water Use and Water Rights*[43] published in 2016, and the *2010 State of the Watershed Report*.[44] Both of these documents organize water use information by watershed. The Drayton WID occupies only part of the Dakota, California Creek, and Schneider Ditch watersheds. Within the Dakota Creek watershed, it occupies most of the South Fork Dakota Creek sub-basin, but only part of the North Fork Dakota and Haynie Creek sub-basins.

The report *Quantification of Agricultural Irrigation Water Use and Water Rights*[45] (2016) estimates water use for agriculture based on crop types, and irrigation methods, and acreage for WRIA 1. Estimated agricultural water use for the watersheds relevant to the Drayton WID is reported in the table below.

Table 4. Estimated agricultural water use in selected watersheds in the Drayton WID area.

	Total acres	Agricultural acres	Irrigated acres	Estimated water use in acre-feet per year
California Creek	14,198	2,755	652	1,185
Dakota Creek	16,794	4,732	2,426	3,673
Schneider Creek	6,253	1,737	1,158	1,732

The 2010 State of the Watershed Report[46] describes metered and modeled water use as a percentage of the overall water use. The report shows no metered water use in the South Fork Dakota, North Fork

[40] See Appendix C for the reference map on agricultural water rights points of diversion in the Drayton WID. That map is reproduced from the Drayton WID mapping report (2016).
[41] WAC 173-501 (1985). Instream Resources Protection Program – Nooksack Resource Inventory Area 1.
[42] Custer Water Association, and City of Blaine. See: Whatcom County Coordinated Water System Plan (2016) http://www.whatcomcounty.us/DocumentCenter/View/24143 [last accessed July 31, 2017]
[43] RH2 Engineering, Inc., 2016. *Quantification of Agricultural Irrigation Water Use and Water Rights*, December 2016. Public Utility District No. 1 of Whatcom County http://wria1project.whatcomcounty.org/ [last accessed8/4/17]
[44] Peterson, B., Gill, P. and J. Fleishmann. 2011. *State of the Watershed Report*. WRIA 1 Watershed Joint Board and Whatcom County. [online] http://wria1project.whatcomcounty.org/ [last accessed August 4, 2017]
[45] RH2 Engineering, Inc., 2016. *Quantification of Agricultural Irrigation Water Use and Water Rights,* ibid.
[46] Peterson, B., Gill, P. and J. Fleishmann. 2011. *State of the Watershed Report.* Ibid.

Dakota, and California Creek watersheds. About 25% of the water use in the Haynie Creek watershed is metered, and about 20% is metered in the Schneider Creek watershed. The remaining non-metered water use, for residential, commercial, and agricultural needs, is estimated from modeled data. In the South Fork Dakota Creek watershed, agricultural use accounts for the overwhelming majority. In California and the North Fork Dakota Creek watersheds residential use accounts for about 15% to 20% and the rest is attributed to agriculture. In the Haynie Creek watershed, in addition to the 25% metered use, about 15% is attributed to residential and the remaining 65% to agriculture. In the Schneider Creek watershed, in addition to the 20% metered use, about 15% of the overall use is attributed to residential and about 65% is attributed to agricultural use.

3.5 Water quality

In the Drayton WID area, there are surface water quality impairments related to high levels of bacteria, low dissolved oxygen, temperature, pH or a combination of these.[47] According to the Department of Ecology's 2016 water quality atlas records, the number and extent of surface water quality impairments in all sub-basins has increased since 2012. Naturally occurring iron in the water likely comes from iron-manganese nodules known to exist in peat in the region. [48]

A map of listed water quality impairments (updated with 2016 information from the WA Department of Ecology) and graphs of the results of routine water quality monitoring are included in Appendix C of this document.

3.6 Fish and wildlife

The California Creek and Schneider Ditch sub-basins contain critical habitat for band-tailed pigeon. Wetland habitat occurs in some parts of the Drayton WID area. Fall Chinook, chum, fall chum, coho, cutthroat and winter steelhead are present.[49, 50] In the North Fork Dakota Creek and Haynie Creek, spawning of coho, fall chum, and winter steelhead has been documented. Fall Chinook spawning is also documented in the North Fork of Dakota and in the mainstem of Dakota Creek the area of Haynie Creek (but not within Haynie Creek itself). In the South Fork Dakota Creek only winter steelhead spawning is documented, and in California Creek only coho spawning is documented.[51]

The watershed tables in Appendix B of this document provide more details on occurrence of specific habitats and species within the WID area. Maps of priority habitats and species, fish occurrence and fish barriers are included in Appendix C of this document.

Maps of priority habitats and species, fish occurrence and fish barriers are included in Appendix C of this document.

---

[47] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

[48] Mitchell, RJ, Babcock RS, Hirsch H, McKee L, Matthews RA & Vanderspyen J (2005), *Water Quality: Abbotsford-Sumas Final Report*. Western Washington University. http://kula.geol.wwu.edu/rjmitch/Report_2005.pdf

[49] Fish Habitat Technical Team (2004), WRIA 1 Watershed Management Project. Data provided by Sarah Watts, Whatcom County Planning & Development Services.

[50] WDFW (n.d.), *SalmonScape* [interactive webmap] <http://apps.wdfw.wa.gov/salmonscape/> [last accessed May 09, 2016]

[51] WDFW (n.d.), *SalmonScape* [interactive webmap] *ibid.*

4 DESCRIPTION OF BASELINE CONDITIONS FOR SUB-WATERSHEDS IN THE DRAYTON WID

Explanatory note

This section provides a summary description of baseline conditions in the Drayton WID. The sub-watershed areas described here are shown in Figure 3, marked as "Ag-watershed characterization areas".

The purpose of describing baseline conditions and quantifying them where possible is to support the design of targeted actions to achieve agreed WID priorities, and to be able to measure and report progress towards achieving the WID priorities over time.

- In the preliminary management plan, this summary information would be expanded using available data where possible, and the gaps in knowledge would be defined in order to determine the scope of any new or additional work needed.
- In the comprehensive management plan, this summary information would be expanded to provide more detailed information which would also include the results of new analyses and field measurements where needed.

Note that Appendix E of this document (reproduced from the Drayton WID mapping report) lists a wide range of sources of data that would be potentially useful as baseline or background information for developing a comprehensive plan.

4.1 Dakota Creek South Fork (Upper)

Water quality: The mainstem of Dakota Creek in this area and its tributary, Rebel Creek, are listed in category 5 for bacteria and dissolved oxygen.[52]

Water quantity: Dakota Creek is closed year-round to further appropriations unless mitigated.[53] Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[54] Between 10 and 25 new water right applications have been filed in this area (see water rights map in Appendix C).

Land use and soils: 95% of the soils in this area are prime, with less than 25% being prime if drained.[55] Virtually all of the land is zoned as AG, indicating important agricultural land (see Ag Land Base map in Appendix C).

Habitats and species: Wetland habitat occurs in the upper Dakota Creek South Fork area (see Priority Habitats and Species map in Appendix C). Chum, coho, and cutthroat are present in Dakota Creek.[56]

Water flow processes: This is an area of relatively low importance for water flow processes overall and moderate importance for delivery, discharge, and recharge specifically. In general, water flow processes are highly degraded here, especially discharge and surface storage processes. Recharge processes are still

[52] See map of water quality impairments in Appendix C of this Preliminary Plan. Data from Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html
[53] WA Department of Ecology, revised 2016. *Focus on Water Availability, Publication 11-11-006* https://fortress.wa.gov/ecy/publications/documents/1111006.pdf [last accessed August 1, 2017]
[54] WAC 173-501 (1985), Instream Resources Protection Program – Nooksack Water Resource Inventory Area 1.
[55] See Agricultural characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[56] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.

relatively intact compared to other parts of this watershed (see maps of water flow process assessment results in Appendix C).

4.2 Dakota Creek South Fork (Lower)

Water quality: The mainstem of Dakota Creek in this area is listed in category 5 for bacteria, dissolved oxygen, and temperature. An unnamed tributary is listed in category 5 for bacteria and dissolved oxygen.[57] The groundwater near Loomis Trail Road reportedly contains elevated iron.[58] The iron likely originates in iron manganese nodules known to exist in peat in the region.[59]

Water quantity: Dakota Creek is closed year-round to further appropriations unless mitigated.[60] Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[61] Between 10 and 25 new water right applications have been filed in this area, mostly along the eastern edge of the sub-basin (see water rights map in Appendix C).

Land use and soils: 94% of the land here is prime, with less than 25% being prime if drained.[62] A small area along the southern boundary of the sub-basin is included in Drainage Improvement District #7.[63] All of the land within the WID boundaries is in AG zoning, indicating important agricultural land. Most of the area is also in a Rural Study Area indicating potential pressure to convert land out of agriculture (see Ag Land Base map in Appendix C).

Habitats and species: Wetland habitat occurs in the lower Dakota South Fork area (see Priority Habitats and Species map in Appendix C). Chum, coho, and cutthroat are present in Dakota Creek.[64]

Water flow processes: This is an area of moderate importance for water flow processes overall, and moderately high importance for discharge and recharge specifically. Water flow processes are moderately to highly degraded (see water flow process assessment results figure in Appendix C).

4.3 Dakota Creek North Fork

Water quality: North Fork Dakota Creek in this section is listed in category 5 for bacteria, dissolved oxygen, and temperature.[65] Participants in the 2016 WID mapping project noted a backup of water at the South Fork and stagnant water in the North Fork as well as high fecal counts at the testing site in this area.[66]

---

[57] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[58] Participant comment from work session January 2016. See Appendix B of this Preliminary Plan.
[59] Mitchell, RJ, Babcock RS, Hirsch H, McKee L, Matthews RA & Vanderspyen J (2005), Water Quality: Abbotsford-Sumas Final Report. Western Washington University. http://kula.geol.wwu.edu/rjmitch/Report_2005.pdf
[60] WA Department of Ecology, revised 2016. *Focus on Water Availability, Publication 11-11-006. Ibid.*
[61] WAC 173-501 (1985), Instream Resources Protection Program – Nooksack Water Resource Inventory Area 1.
[62] See Agricultural characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[63] Whatcom Conservation District, n.d. *Find out what District you live in!* http://www.whatcomcd.org/ag-drainage-districts [last accessed August 1, 2017]
[64] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[65] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[66] Participant comment, work session 2016. See Appendix B of this Preliminary Plan

Water quantity: Dakota Creek is closed year-round to further appropriations unless mitigated.[67] Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[68] Fewer than 3 new water right applications have been filed in this area (see water rights map in Appendix C).

Land use and soils: 85% of the soils here are prime.[69] Within the WID boundaries, the soils are a mix of prime, prime if drained, and prime if subsoiled (see Prime Soils map in Appendix C). AG zoning, indicating important agricultural land, applies to less than 50% of the land within the WID boundaries in the Dakota Creek North Fork area. The portion closes to the Lower Dakota South sub-basin is part of a Rural Study Area, indicating potential pressure to convert land out of agriculture (see Ag Land Base map in Appendix C).

Habitats and species: Wetland habitat occurs in the Dakota Creek North Fork sub-basin. Fall Chinook, coho, fall chum, and winter steelhead spawning is documented in the north fork of Dakota Creek.[70] Cutthroat are also present here (see Priority Habitats and Species map in Appendix C).

Water flow processes: This is an area of relatively low importance for water flow processes overall but, for most of the WID area here, discharge is of moderately high importance, while delivery and recharge are of moderate importance. For a small area along the northern WID boundary within the sub-basin, delivery is of moderately high importance and the other water flow processes are of low importance. Overall water flow processes are moderately degraded (see water flow process assessment results figure in Appendix C).

4.4 Haynie Creek

Water quality: Haynie Creek, a tributary to Dakota Creek, is listed in category 5 for bacteria and dissolved oxygen and the small section of Dakota Creek that is within the Haynie sub-basin is listed in category 5 for bacteria, dissolved oxygen and temperature.[71] These water bodies are outside the WID boundaries.

Water quantity: Dakota Creek is closed year-round to further appropriations unless mitigated.[72] Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[73] Three new water right applications have been filed in this area, all along the northeast edge of the WID boundaries here (see water rights map in Appendix C). One Group A public water supplier does not have adequate water rights in proper locations to meet projected future demand.[74]

---

[67] WA Department of Ecology, revised 2016. *Focus on Water Availability, Publication 11-11-006. Ibid.*
[68] WAC 173-501 (1985), Instream Resources Protection Program – Nooksack Water Resource Inventory Area 1.
[69] See Agricultural characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[70] WDFW (n.d.), SalmonScape [interactive webmap] http://apps.wdfw.wa.gov/salmonscape/map.html [last accessed May 09, 2016]
[71] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[72] WA Department of Ecology, revised 2016. *Focus on Water Availability, Publication 11-11-006. Ibid.*
[73] WAC 173-501 (1985), Instream Resources Protection Program – Nooksack Water Resource Inventory Area 1.
[74] City of Blaine. See: Whatcom County Coordinated Water System Plan (2016) http://www.whatcomcounty.us/DocumentCenter/View/24143 [last accessed July 31, 2017]

Land use and soils: Just over half of the soils in the Haynie sub-basin are classified as prime.[75] Within the WID boundaries, most of the soils are prime if subsoiled and some are prime if drained (see Prime Soils map in Appendix C). AG zoning, indicating important agricultural land, applies to less than half of the land within the WID in this sub-basin. And all of this land is also in a Rural Study Area indicating potential pressure to convert land out of agriculture (see Ag Land Base map in Appendix C).

Habitats and species: Fall Chinook, coho, fall chum, and winter steelhead spawning is documented in Haynie and Dakota Creeks here[76] and the habitat in this area is considered by local residents to be good.[77]

Water flow processes: This is an area of high importance for discharge and moderately high importance for recharge and storage processes. Overall water flow processes are moderately degraded but discharge and recharge processes remain relatively intact (see water flow process assessment results figure in Appendix C).

4.5 Upper California Creek

Water quality: The section of California Creek that lies within the Drayton WID is listed in category 5 for bacteria, dissolved oxygen, and temperature.[78] Elevated iron in groundwater water likely originates in iron manganese nodules known to exist in peat in the region.[79] The groundwater quality may not be suitable for livestock, according to a participant at the February 2016 work session.[80]

Water quantity: California Creek is closed year-round to further appropriations unless mitigated.[81] Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[82] Two new water right applications have been filed in this area (see water rights map in Appendix C). One Group A public water supplier does not have adequate water rights in proper locations to meet projected future demand.[83]

Land use and soils: 83% of the soils the Upper California Creek area are prime. Less than 50% of the soils in the sub-basin are prime if drained[84] but within the WID boundaries, most of the soils are prime if drained or prime if subsoiled (see Prime Soils map in Appendix C). Part of the WID is within Drainage and Irrigation Districts #17 and #7, and a small part overlaps Drainage District #2.[85] Most of the land in this part of the WID is zoned AG, indicating important agricultural land, and the majority is included in a Rural

---

[75] See Agricultural characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[76] WDFW (n.d.), SalmonScape [interactive webmap] http://apps.wdfw.wa.gov/salmonscape/map.html [last accessed May 09, 2016]
[77] Participant comment, work session 2016. See Appendix B of this Preliminary Plan.
[78] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[79] Mitchell, RJ, Babcock RS, Hirsch H, McKee L, Matthews RA & Vanderspyen J (2005), Water Quality: Abbotsford-Sumas Final Report. Western Washington University. http://kula.geol.wwu.edu/rjmitch/Report_2005.pdf
[80] Participant comment, work session 2016. See Appendix B of this Preliminary Plan.
[81] WA Department of Ecology, revised 2016. *Focus on Water Availability, Publication 11-11-006. Ibid.*
[82] WAC 173-501 (1985), Instream Resources Protection Program – Nooksack Water Resource Inventory Area 1.
[83] Custer Water Association. See: Whatcom County Coordinated Water System Plan (2016) http://www.whatcomcounty.us/DocumentCenter/View/24143 [last accessed July 31, 2017]
[84] See Agricultural characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[85] Whatcom Conservation District, n.d. *Find out what District you live in!* http://www.whatcomcd.org/ag-drainage-districts [last accessed August 1, 2017]

Study Area, indicating potential pressure to convert land out of agriculture (see Ag Land base map in Appendix C).

Habitats and species: Critical habitat for band tailed pigeon, and also wetland habitat occurs in the upper California Creek area. Coho, cutthroat, and steelhead presence,[86] and coho spawning, are also documented here.[87]

Water flow processes: This part of the WID covers multiple Puget Sound Watershed Characterization Project assessment units and the value and state of water flow processes in these assessment units varies. In the western part of the Upper California Creek sub-basin, surface storage is of high importance. In the southwestern area, discharge is of high importance. Surface storage and discharge are highly degraded over most of the sub-basin area. Delivery is highly degraded in the eastern area, and recharge is highly degraded in the southeastern area. Where water processes are not highly degraded they are moderately degraded (see water flow process assessment results figure in Appendix C).

4.6 Schneider Ditch (North)

Note that only a small portion of Schneider Ditch North is inside the Drayton WID boundary.

Water quality: Schneider Ditch, also known as Keefe Lake Outlet, is listed in category 5 for dissolved oxygen, pH, and temperature and category 4a for bacteria.[88]

Water quantity: One new water right application has been filed in this area (see water rights map in Appendix C).

Land use and soils: 97% of the soils in this area are prime with less than 25% of the soils being prime if drained.[89] Within the WID boundaries, the soils are either prime or prime if subsoiled (see Prime Soils map in Appendix C). Drainage District #2 covers about half of the area here, but only overlaps the WID boundary along the northern portion of the sub-basin.[90] Almost all of the land in this part of the WID is zoned AG, indicating important agricultural land. The area within the WID, near the southern boundary of the sub-basin, is in a Rural Study Area indicating potential pressure to convert land out of agriculture (see Ag Land Base map in Appendix C).

Habitats and species: Critical habitat for band tailed pigeon occurs in the northern part of the Schneider Ditch North sub-basin (see Priority Habitats and Species map in Appendix C). There is documented presence of some salmonid species in Schneider Ditch.[91]

Water flow processes: Degradation of overall water flow processes is moderate-high, with surface storage and delivery processes in particular being highly degraded. However, this area is of relatively low importance for water flow processes overall in the watershed (see water flow process assessment results figure in Appendix C).

---

[86] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[87] WDFW (n.d.), SalmonScape [interactive webmap] http://apps.wdfw.wa.gov/salmonscape/map.html [last accessed May 09, 2016]
[88] See Watershed characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[89] See Agricultural characterization tables for the Drayton WID in Appendix B of this Preliminary Plan.
[90] Whatcom Conservation District, n.d. *Find out what District you live in! ibid.*

5 SUPPORTING INFORMATION FOR PLANNING OF SPECIFIC ACTIONS

Explanatory notes

In the comprehensive management plan, this section would contain as much detail as possible on priority actions agreed by the WID, including a description and rationale for each task, a planned schedule, and indication of who would assist in implementation. Some priority actions might require additional resources, more detailed baseline studies or collection of new data: descriptions of these actions would be supported by a scope of work and estimated budget.

Maintenance of agricultural drainage and management of water quality are two areas where the WID has been particularly active and already has a number of actions planned or ongoing. In cases where there might be little or no available information on how the WID proposes to address an issue and implement priority actions related to that issue, we have made some notes about how actions might be identified and prioritized during further development of the WID's management plan.

This section will be updated after discussion with the WID board. Currently, the suggested list of sub-sections to be included is:

- Hydrology and water availability; water use and water rights
- Water quality (surface and groundwater)
- Agricultural field drainage
- Flooding and stormwater management
- Water flow processes; fish and wildlife
- Communication, outreach, education & reporting
- Agricultural protection (protection of the agricultural industry)

As the management plan is developed in more detail, it is likely that different actions will be prioritized in different parts of the WID area, depending on farmers' needs and availability of resources.

5.1 Hydrology and water availability; water use and water rights

5.1.1 Desired outcomes, goals and possible actions

In subsequent versions of the management plan, this section would include:

- a review of what information is readily available to determine
  - water availability for current and future agricultural water needs (both surface and groundwater),
  - climate (focus on precipitation and temperature) and potential evapotranspiration analysis,
  - estimates of current water use for agricultural purposes and potential future demand.
- scope of work and resources needed for any additional work that might be needed to collate data or to conduct relevant baseline assessments, to be incorporated into the WID's comprehensive management plan;
- priority actions, responsibilities and timelines.

Specialists: Joanne Greenberg and Jim Bucknell

From Table 2, the suggested priority actions are:

i. *Deep water aquifer project: continue work with BBWSD, move beyond exploration to develop this as a water supply option, possibly including water banking and/or mitigation for new water rights (March 2017 notes, 2016-2017 minutes)*
ii. *Coordinate with AWB and other WIDS to pursue additional options to secure sufficient agricultural water, such as water exchange or water banking, changes in place of use, water storage through aquifer recharge etc.* (3/2017 work session, 4/2017 meeting)*
iii. *Expand hydrological analysis to include surface water, climate, and evapotranspiration, to assess current general water use and water availability and identify shortfalls – possibly coordinate with other WIDs on the analysis**
iv. *Coordinate with Ag Water Board for actions related to water rights and for participation in the Water Supply Work Group (2/2017 meeting, 3/2017 work session)*
v. *Coordinate with AWB on the Drought Planning Task Force (1/2017)*
vi. *Support & coordinate with Ag Water Board to communicate water rights concerns (noted from 3/2017 work session)*

** denotes actions that may need additional resources, and more detailed scope & description*

5.1.2 Supporting information related to hydrology, water use and water rights

Additional supporting information related to the recently completed, ongoing and future priorities listed in Table 2 includes:

- Agricultural and watershed characterization tables contained in Appendix B of this preliminary plan
- Reference maps contained in Appendix C of this preliminary plan
- Data sources listed in Appendix E of this preliminary plan
- RH2 Engineering, Inc., 2016. *Quantification of Agricultural Irrigation Water Use and Water Rights*, December 2016. Public Utility District No. 1 of Whatcom County http://wria1project.whatcomcounty.org/ [last accessed 8/4/17]
- PUD#1 (2016) Whatcom County Streamflow Analysis

- Summary of results and references for the groundwater modeling project – currently there are documents available at http://wria1project.whatcomcounty.org/Resource-Library/2016-Groundwater-Forum/116.aspx
- Whatcom County Coordinated Water System Plan (2016) http://www.whatcomcounty.us/DocumentCenter/View/24143 [last accessed July 31, 2017]
- Peterson, B., Gill, P. and J. Fleishmann. 2011. *State of the Watershed Report*. WRIA 1 Watershed Joint Board and Whatcom County. [online] http://wria1project.whatcomcounty.org/ [last accessed August 4, 2017]

5.2 Water quality (surface and groundwater)

5.2.1 Desired outcomes, goals and possible actions

In subsequent versions of the management plan, this section would include:
- a review of what information is readily available to determine current status and trends in water quality and implementation of BMPs;
- scope of work and resources needed for any additional work that might be needed to collate data or to conduct relevant baseline assessments, to be incorporated into the WID's comprehensive management plan;
- priority actions, responsibilities and timelines.

Specialists: Anneke Sweeney, Nichole Embertson

From Table 2, the suggested priority actions are:

v. Continue with the ongoing water quality monitoring & response program (March 2017 notes).

*vi. Coordinate with other WIDs on funding for and implementation of source tracking of fecal pollution using DNA markers (6/2017, March 2017 work session)**

vii. Maintain a watching brief on installation of ZAPS technology for real-time monitoring of fecal coliforms/E. Coli in water, as Whatcom Conservation District & County Department of Health plan to install several ZAPS units in the area waterways. (2/2017)

Additional actions that might be considered for inclusion here (from meeting discussions & other WID documents):

*viii. Encourage agricultural landowners in the WID to implement appropriate BMPs, with assistance from the Conservation District**

ix. Coordinate with other WIDs to adopt a consistent response strategy across the WIDs for addressing reports of questionable practices or consistently high fecal coliform test results (1/2016, 3/2016, 4/2016)

** denotes actions that may need additional resources, and more detailed scope & description*

5.2.2 Supporting information related to water quality

Additional supporting information related to the recently completed, ongoing and future priorities listed in Table 2 includes:
- Agricultural and watershed characterization tables contained in Appendix B of this preliminary plan

- Reference maps contained in Appendix C of this preliminary plan
- Data sources listed in Appendix E of this preliminary plan

5.3 Agricultural field drainage

5.3.1 Desired outcomes, goals and possible actions

In subsequent versions of the management plan, this section would include:

- next steps that the WID would take to discuss and agree on selected priority actions for maintaining drainage infrastructure and ditches in the WID area in collaboration with the Drainage Improvement Districts within the WID;
- scope of work and resources needed for any additional work that might be needed to collate data or to conduct relevant baseline assessments for a set of agreed actions, to be incorporated into the WID's comprehensive management plan;
- priority actions, responsibilities and timelines.

Specialists: Frank Corey

From Table 2, the suggested priority actions are:

*ii. Proactively identify locations for mitigation sites and mitigation actions (e.g. culvert replacement, riparian vegetation) to be addressed in programmatic 5-year drainage permits, that could also contribute to advancing watershed & habitat priorities (see watershed enhancement tables in Appendix B) **

iii. Coordinate with Whatcom County on prioritizing ditch maintenance activities (11/2015, 12/2015, 3/2016, 11/2016)

iv. *Document the specific procedures for responding to situations requiring ad hoc or emergency actions. Include these procedures in the management plan and in WID communications/website.*

**denotes actions that may need additional resources, and more detailed scope & description*

5.3.2 Supporting information related to field drainage

The following supporting information supports the WID's discussions related to agricultural drainage and the development of an action plan for inclusion in the preliminary WID management plan:

- Map of the WID boundary (Figure 6 below), which also shows the modified waterways and ditches that are maintained as part of the drainage infrastructure.
- Map of priority actions identified by the WID in the February 2016 work session (Figure 7 below). These actions are almost all related to drainage and flooding. The actions are listed in Table 5 below.
- Agricultural reference map (Appendix C of this document) indicating where soils are Prime if drained.
- Detailed agricultural and watershed enhancement tables prepared at the WID work session in February 2016 indicate drainage concerns and priorities in different parts of the WID. The tables are contained in Appendix B of this document.
- Drainage management plans for Drainage District #2, Drainage Improvement Districts #7 and #17 http://www.whatcomcd.org/ag-drainage-districts
- Information on the programmatic permitting process for stream projects involving drainage and/or habitat (see Table 6)
- Data sources listed in Appendix E of this preliminary plan.

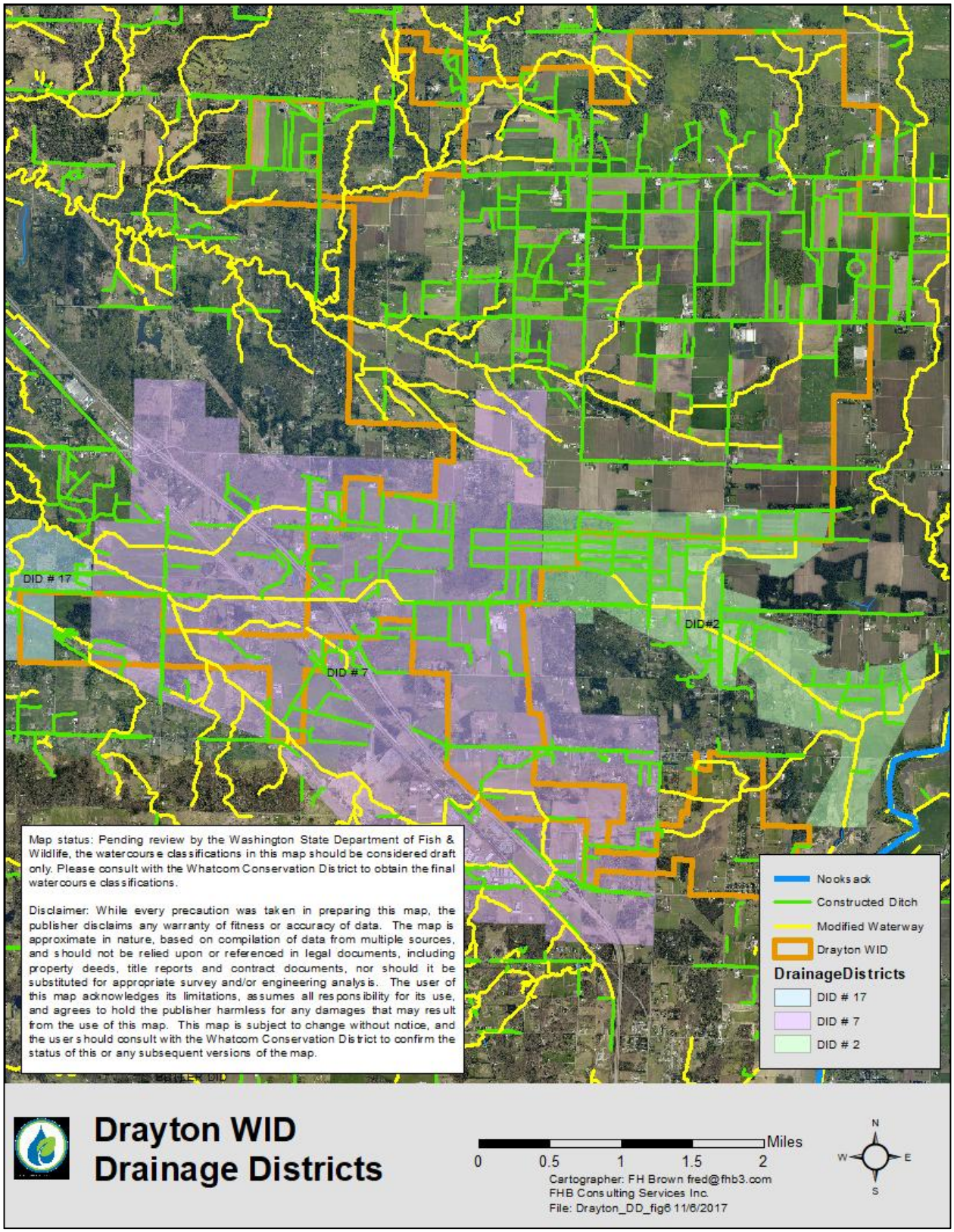


Figure 6. Map showing the Drayton WID and drainage districts. Data: Whatcom Conservation District.

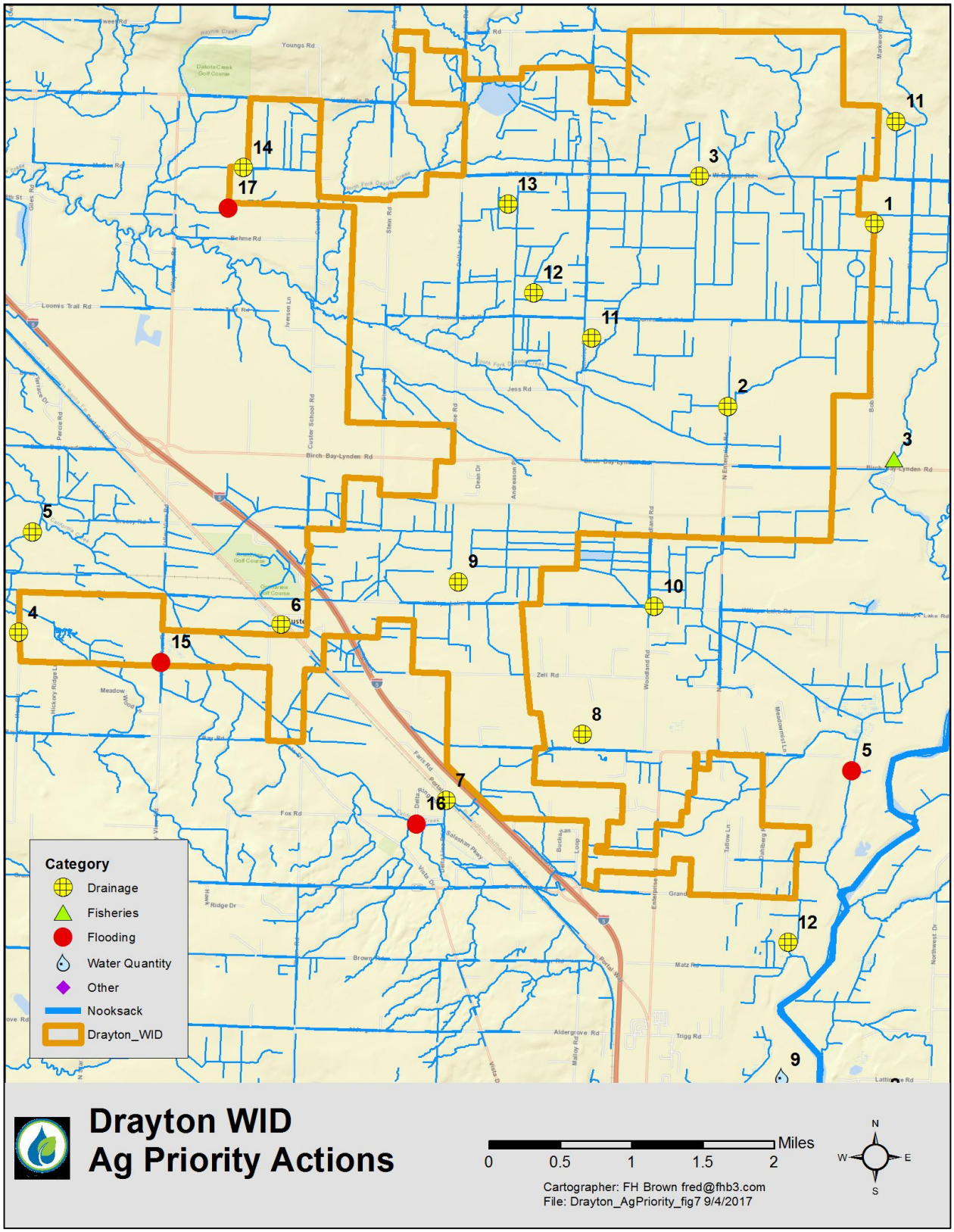


Figure 7. Drayton WID map of specific agricultural priority actions (from WID work session in February 2016). See table below for map key.

Table 5. Key for actions on agricultural priority actions map in Figure 7

Action # on map	AU #	Priority	Notes (This table was generated during the WID work session in January 2016)
1	1108	Drainage	Drainage blocked by WDFW fish culvert then backs up surface water. Need soils dry, drained.
2	1115	Drainage	New ditch at Enterprise Road is filling in.
3	1115	Drainage	Whatcom County road ditch: (Badger Rd, east of Sunrise Rd) sporadic cleaning is not enough.
4	1125	Drainage	Clogged culvert.
5	1125	Drainage	Beaver problems in wooded area in ditches south of California Creek.
6	1123	Drainage	Blocked railroad culvert.
7	1122	Drainage	Blocked railroad culvert.
8	1122	Drainage	Poor drainage causes houses here to flood.
9	1124	Drainage	Peat soils, drainage required.
10	1109	Drainage	Beaver plugging drainage tile, water going under road near Woodland Rd.
11	1115	Drainage	Drainage issue. More drainage outflow capacity is needed at County right-of-way.
12	1116	Drainage	Drainage needs to be maintained.
13	1116	Drainage	Wet area. Drainage needs improvement.
14	1119	Drainage	Drainage rerouted, used to flow west direct, now jogs south to west through woodlot to Haynie Creek.
15	1123	Flooding	Water over Valley View Road for 1-2 months.
16	1123	Flooding	Beaver dams on California Creek affect people on Old Hwy 99.
17	1119	Flooding	Beaver activity causing flooding.

Table 6. Programmatic permitting process for stream projects (drainage, habitat)

(Information provided by Frank Corey, Whatcom Conservation District)

Washington Department of Fish & Wildlife (WDFW) can issue a 5-year permit (Hydraulic Project Approval) based upon a Drainage Maintenance and Habitat Improvement Plan.
Whatcom County Planning & Development Services (PDS) can concurrently issue a programmatic Land Disturbance Permit or Shorelines Exemption.

Basic Plan Components:

- General description of District and important natural and structural features
- Watercourse classification map
- General list of 5-year drainage maintenance needs
- General list of habitat projects to offset impacts of drainage maintenance and voluntary habitat improvement projects
- Annual reporting forms
- Mitigation sequencing process
- Typical cross-section for maintenance dredging
- Best management practices
- ESA Habitat Assessment and mitigation plan for floodplain areas
- WDFW notification requirements individual projects (includes discussion of mitigation)
- PDS Natural Resource Notification of Activity ($35.00) for individual projects
- SEPA
- LDP or shorelines

Permitting pathway:

1. Complete Drainage Maintenance and Habitat Improvement Plan
2. Complete non-project SEPA checklist
3. Complete Shorelines Exemption or Land Disturbance Permit (LDP) applications
4. Complete on-line Joint Aquatic Resource Permit Application (JARPA)
5. Submit Plan, SEPA, Shorelines (or LDP), and supporting information to PDS
6. Submit JARPA to WDFW
7. Notify WDFW (call or email) and PDS (Notification form) for each project prior to implementation.
8. Also submit mitigation plans for each project. Preferred mitigation will be on-site and in-kind (example planting). Other mitigation such as replacing culverts that are barriers to fish passage also possible.
9. Submit annual reports to WDFW and PDS

Permit Fees

· WDFW	$175.00
· SEPA	$535.00
· LDP	$600.00*
· (or Shorelines Exemption	$435.00)**
· (Flood Review	$110.00)**

*Other fees may apply
**If in floodplain

5.4 Flooding and stormwater management

5.4.1 Desired outcomes, goals and possible actions

The map of agricultural priorities (Figure 7) includes several possible actions to maintain flood infrastructure in specific locations within the Drayton WID area.

In subsequent versions of the management plan, this section would include:

- next steps that the WID would take to discuss and agree on selected priority actions for protecting agricultural land from flooding, in collaboration with Whatcom County Public Works;
- scope of work and resources needed for any additional work that might be needed to collate data or to conduct relevant baseline assessments for a set of agreed actions, to be incorporated into the WID's comprehensive management plan;
- priority actions, responsibilities and timelines.

Specialists:

From Table 2, the suggested priority actions are:

ii. *Review and update priority actions identified at the February 2016 work session (see list in Table 5 and map in Figure 7. Specific concerns include flooding on Valley View Road (4/2016) and Old Highway 99 as a result of beaver activity.*

5.4.2 Supporting information related to flooding and stormwater management

The following supporting information supports the WID's discussions related to flooding and stormwater management and the development of an action plan for inclusion in the WID management plan:

- Map in Figure 8 showing flood infrastructure along the Nooksack River.
- Detailed agricultural and watershed enhancement tables prepared at the WID work session in February 2016 indicate flooding concerns and priorities in different parts of the WID. The tables are contained in Appendix B of this document.
- Data sources listed in Appendix E of this preliminary plan.

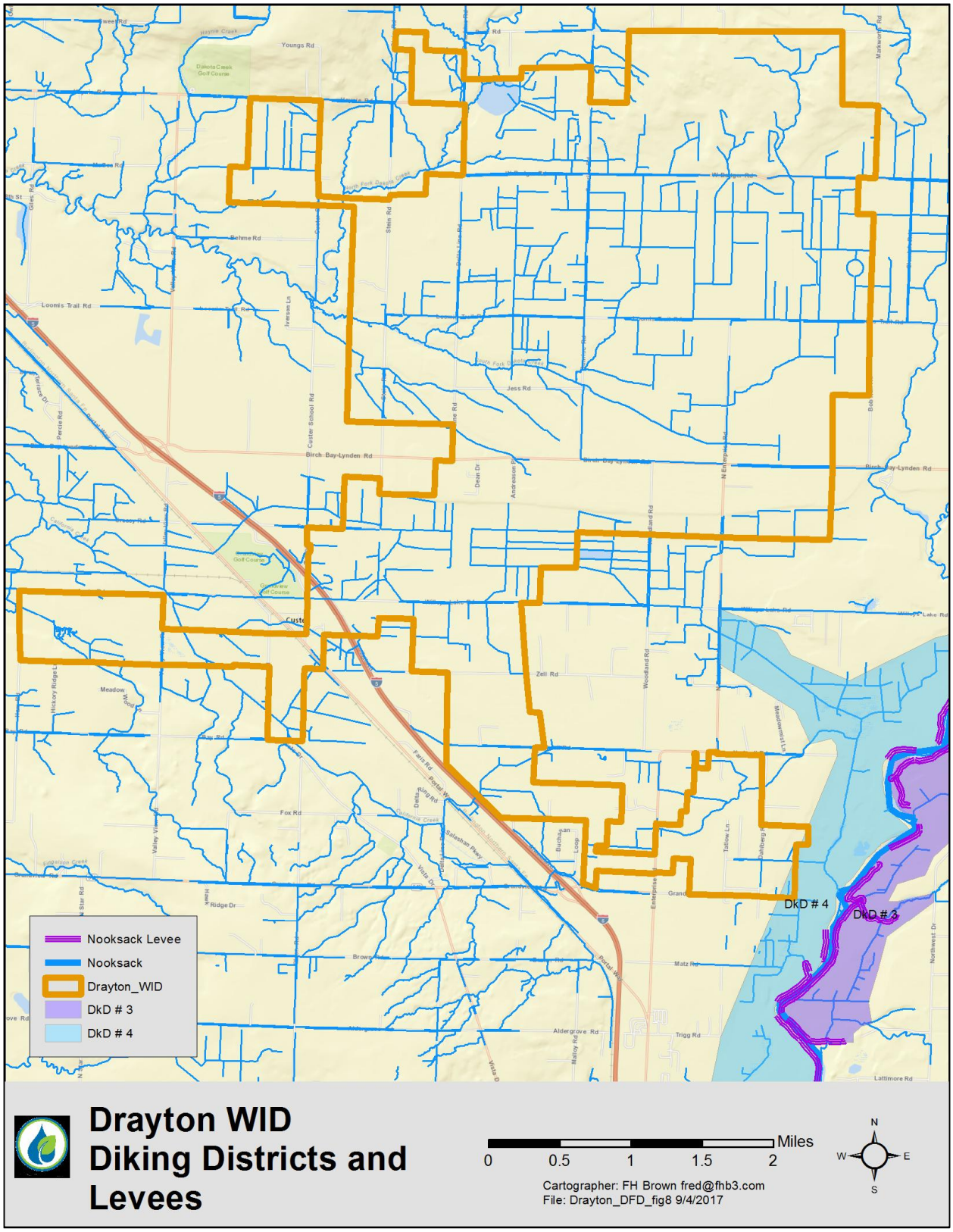


Figure 8. Map showing Diking Districts and Nooksack River levees associated with the Drayton WID area.

5.5 Water flow processes; fish and wildlife

5.5.1 Desired outcomes, goals and possible actions

During the February 2016 WID work session, priorities for water flow processes and fish and wildlife (including habitats) were discussed in some detail and suggested actions were noted for specific locations within the Drayton WID. The results of these discussions and the supporting analyses are contained in the Drayton WID mapping report.

For easier reference, we have included the summary map of watershed enhancement priorities in Appendix A of this document, and the detailed information on watershed characterization can be found in the tables in Appendix B of this document.

The watershed characterization tables provide suggestions for site-specific watershed actions that the WID can use to begin developing their action plan, and to identify potential mitigation sites that could be included in a drainage management plan. For example, Table 5A in Appendix B contains the following note under "Summary & potential for enhancement":

> "Upper Dakota Creek (south): Overall water flow processes are highly degraded, especially discharge and surface storage processes. Although this is an area of relatively low importance for water flow processes overall, recharge processes are still relatively intact compared to other parts of this watershed. Actions should focus on protecting existing vegetated cover and preventing new impervious cover in order to maintain recharge processes."

In subsequent versions of the management plan, this section would include:

- next steps that the WID would take to discuss and agree on selected priority actions for protecting or enhancing water flow processes, fish and wildlife habitats in the WID area, using the information in the watershed characterization maps and tables (see Appendix B) and any other relevant information (see Appendix E);
- scope of work and resources needed for any additional work that might be needed to collate data or to conduct relevant baseline assessments for a set of agreed actions, to be incorporated into the WID's comprehensive management plan;
- priority actions, responsibilities and timelines.

Specialists:

From Table 2, the suggested priority actions are:

*ii. Review possible actions to enhance or protect water flow processes in specific locations within the Drayton WID area, as listed in the watershed characterization tables prepared during the WID work session in February 2016 (see tables in Appendix B of this document).**

- *Suggested actions in specific parts of the WID include, for example, enhancing surface water storage, reducing or preventing additional impervious cover, protecting and/or restoring riparian and forest cover, reducing subsurface drainage rates.*

*iii. Proactively identify locations for mitigation sites and mitigation actions (e.g. culvert replacement, riparian vegetation) to be addressed in programmatic 5-year drainage permits, that could also contribute to advancing watershed & habitat priorities (see watershed enhancement tables in Appendix B) **

iv. Riparian planting (South Fork Dakota Creek just downstream from Sunrise Road was noted as a priority area at the meeting of 4/2016)

** denotes actions that may need additional resources & more detailed scope & description*

5.5.2 Supporting information related to water flow processes, fish and wildlife

The following supporting information supports the WID's discussions related to water flow processes, fish and wildlife, and the development of an action plan for inclusion in the WID management plan:

- Detailed agricultural and watershed enhancement tables prepared at the WID work session in February 2016 indicate priorities for water flow processes, fish and wildlife in different parts of the WID. The tables are contained in Appendix B of this document.
- Reference maps contained in Appendix C of this document.
- Data sources listed in Appendix E of this preliminary plan.

5.6 Agricultural protection (protection of the agricultural industry)

Protection of the agricultural industry will require not just protection of the agricultural land base, but also the provision of agricultural infrastructure and the ability to continue normal farming operations on working farmland.

In the preliminary version of the management plan, this section would include:

- scope of work and resources needed for any additional work that might be needed to collate data or to conduct relevant baseline assessments, to be incorporated into the WID's comprehensive management plan;
- priority actions, responsibilities and timelines.

5.6.1 Desired outcomes, goals and possible actions

From Table 2, the suggested priority actions are:

i. Pursue options to provide secure water supply for agricultural users, in order to safeguard agricultural production in the WID area over the long term.

ii. Coordinate with Whatcom Family Farmers to address legal challenges and preserve "one voice outreach" on behalf of agriculture (from March 2017 work session)

*iii. Engage and communicate with non-ag landowners in the WID area about WID priorities and programs, normal farming operations, right-to-farm etc. (include specific actions in the communication strategy)**

** denotes actions that may need additional resources, and more detailed scope & description*

5.6.2 Supporting information related to agricultural protection

Available supporting information includes:

- Agricultural and watershed characterization tables contained in Appendix B of this preliminary plan
- Reference maps contained in Appendix C of this preliminary plan

5.7 Communication, outreach, education and reporting strategy

In addition to the technical work associated with preparing a management plan and implementing actions on the ground, the WID board will need to keep communicating internally with WID members and engaging with them on addressing agreed priority issues, and communicating externally with neighboring landowners, other stakeholders and relevant agencies.

While much of the work of external communication and engagement would be coordinated through the Ag Water Board, Drayton-specific information and inputs will be needed for the AWB's efforts.

In subsequent versions of the management plan, this section would include:

- An outline of how the WID currently approaches internal and external communication and engagement;
- Next steps for communication and engagement related to the development of a comprehensive management plan;
- Scope of work and resources needed to assist the WID in communication and engagement related to future implementation of the plan, including templates for regular reporting on progress with priority issues and actions;
- priority actions, responsibilities and timelines.

Specialists:

From Table 2, the suggested priority actions are:

i. *Comprehensive Plan: Seek grant funding to develop and implement a comprehensive management plan*
ii. *Outreach & reporting:*
    a. *Establish a template for tracking and regular reporting of WID progress on priority issues, based on a set of simple indicators of progress.**
    b. *Continue to distribute newsletter to WID members summarizing WID progress.*
iii. *Support Ag Water Board's work with key partners to relate positive stories about agriculture such as what farmers are doing to benefit habitat and water quality to stakeholders, relevant bodies and agencies, and media (March 20th work session notes).*
iv. *Coordinate with other WIDs to help members build skills for effective engagement and communication with stakeholders (3/2017 work session).*

** denotes actions that may need additional resources, and more detailed scope & description*

Appendix A: Executive Summary of the 2016 Agriculture-Watershed Characterization and Mapping Report for the Drayton WID

Contains maps and a summary table showing the agricultural and watershed enhancement priorities based on the February 2016 work session with Drayton WID members and on additional technical analysis by the Ag-Watershed Project team. The full WID mapping report can be downloaded from the Drayton WID website https://www.draytonwid.com/ [Alternative download <here>]

Source:
Whatcom County Agriculture-Watershed Pilot Project (2016). *Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District*. Whatcom County Planning & Development Services. https://www.Draytonwid.com/ [Alternative download <here>]

Drayton Watershed Improvement District
Executive Summary: Agriculture-Watershed Characterization and Mapping
August 2016

Whatcom County Ag-Watershed Project

PROJECT PARTNERS

Whatcom Conservation District

Washington Department of Fish and Wildlife

Whatcom Farmfriends

CONSULTING PROJECT MANAGER

FHB Consulting Services Inc.

The Ag-Watershed Project is a research and development project funded by a National Estuary Program Watershed Protection and Restoration Grant (June 2012 to June 2016) to Whatcom County Planning & Development Services, administered by the Washington Department of Commerce. Project partners include: Whatcom Farm Friends–Community Education, Whatcom Conservation District and Washington State Department of Fish & Wildlife.

Project fact sheets and links to all previous work, including technical reports and reference documents can be found at http://whatcomcounty.us/2260/Agricultural-Watershed-Pilot-Project

Acknowledgements

This document was compiled by members of the Ag-Watershed Project team: Henry Bierlink, Fred Brown, Mary Dumas, Katie Gaut, John Gillies, Heather MacKay, Cheryl Lovato Niles.

Colin Hume, Susan Grigsby and Stephen Stanley of the Washington Department of Ecology provided technical assistance and guidance.

The Commissioners and members of the Watershed Improvement District, and staff of Whatcom County Planning & Development Services, Whatcom County Public Works, Washington State University Extension, Whatcom Conservation District and Washington Department of Fish & Wildlife provided their local knowledge and information on agricultural and watershed priorities, and provided valuable inputs during work sessions and in the review of draft work products.

Photo credits: Mary Dumas, John Gillies, Heather MacKay

For more information on the Ag-Watershed Project, please contact the project leads:

Karin Beringer
Whatcom County Planning & Development Services
Bellingham, Washington 98226
kberinge@co.whatcom.wa.us

Heather MacKay
FHB Consulting Services Inc.
Lynden WA 98264
heather@fhb3.com

THIS PROJECT HAS BEEN FUNDED WHOLLY OR IN PART BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY UNDER PUGET SOUND ECOSYSTEM RESTORATION AND PROTECTION COOPERATIVE AGREEMENT GRANT PC-00J20101 WITH THE WASHINGTON DEPARTMENT OF ECOLOGY. THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT THE VIEWS AND POLICIES OF THE ENVIRONMENTAL PROTECTION AGENCY, NOR DOES MENTION OF TRADE NAMES OR COMMERCIAL PRODUCTS CONSTITUTE ENDORSEMENT OR RECOMMENDATION FOR USE.

Background

The agriculture-watershed characterization maps and tables combine existing spatial data with field experience and farmers' local knowledge to identify agricultural priorities and needs in the lowland areas of Whatcom County and to bring those into the planning conversation with watershed priorities and needs. The results are intended to support integrated land and water planning at watershed scale, and to support the identification and prioritization of agricultural and watershed enhancement actions at farm and reach scale. These products will be provided to the Watershed Improvement Districts (WIDs) and Special Districts to inform and complement their current comprehensive planning work.

The full characterization and mapping report for the Drayton WID[1] contains the reference information, work session information and results of the agriculture-watershed characterization and analysis conducted in 2016. The document is arranged into sections that allow easy access to specific categories of information.

The results of the characterization and mapping have also been incorporated into an online story map at http://arcg.is/29MYdYu [2]

A customized report has been prepared for each of the six Watershed Improvement Districts in Whatcom County. Full reports for other Watershed Improvement Districts can be accessed through the WID websites[3] or through the Ag-Watershed Project page.[4]

The characterization and mapping results presented in this report have been derived from multiple information sources. The information is provided for planning purposes only, is not for use in regulatory actions, and is intended to contribute to ongoing Whatcom County Planning and Development Services efforts to improve agricultural and watershed conditions.

Definitions: for the purposes of the Ag-Watershed Project,

- *agricultural enhancement* entails maintaining the land base, soil, water, air, plants, animals, production capacity and natural infrastructure necessary to keep farmers farming over the long term as land uses and economic situations change over time. Thus "agricultural enhancement" and "agricultural protection" include but are not limited to agricultural land protection alone.
- *watershed enhancement* actions are those actions which improve the ability of the watershed to provide its natural benefits and services to communities. Watershed enhancement includes the idea of "repairing" major landscape processes related to hydrology and ecosystems, in order to maintain, protect or improve the delivery of watershed services.

[1] Whatcom County Agriculture-Watershed Pilot Project (2016). *Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District.* Whatcom County Planning & Development Services. Download from http://www.draytonwid.com/

[2] Whatcom County Agriculture-Watershed Project (2016), *Agriculture-Watershed Characterization & Mapping, Whatcom County*. Story map prepared for the Whatcom County Agriculture-Watershed Pilot Project, Whatcom County Planning & Development Services, Bellingham

[3] Links to each WID website can be found at http://www.agwaterboard.com/

[4] See http://www.co.whatcom.wa.us/2260/Agricultural-Watershed-Pilot-Project

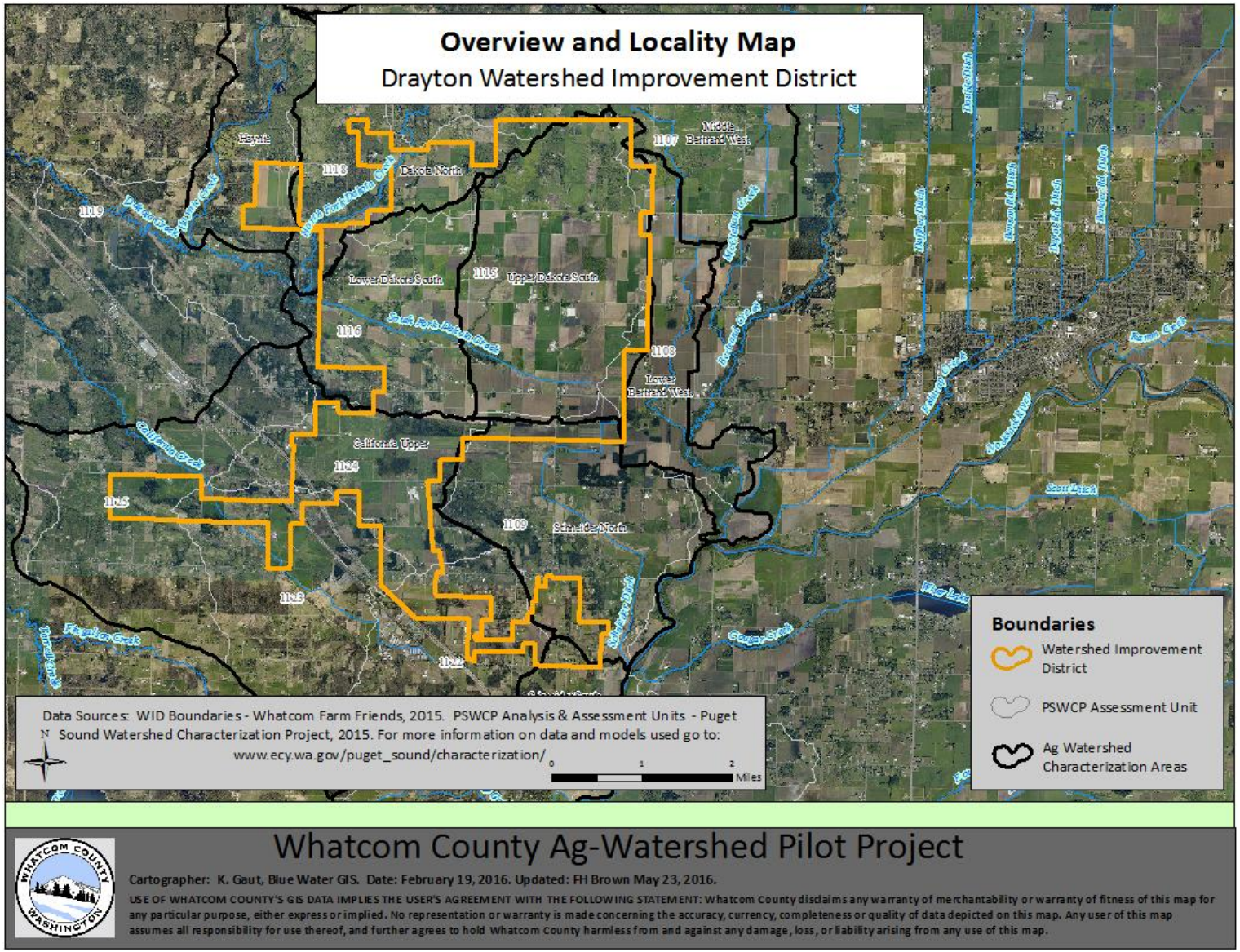


Figure 1. Drayton WID overview and locality map

Approach used for agriculture-watershed characterization

Pilot characterization and mapping (2012)

The methodology for agriculture-watershed characterization and mapping was developed and pilot-tested during Phase 1 of the Ag-Watershed Project. The pilot focus area covered the Bertrand, Fishtrap and Kamm watersheds. The pilot results are reported in the Phase 1 report on mapping and characterization (Gill, 2013).[5] Project Fact Sheet 2 provides additional background information on the agriculture-watershed characterization and mapping process.[6]

Information that was gathered during the pilot study in 2012 was reviewed and updated and has been incorporated into the 2016 agriculture-watershed characterization reports for the Bertrand, North Lynden and South Lynden Watershed Improvement Districts.

Brief description: Methodology used for the 2016 WID characterization and mapping

Areas within the Drayton Watershed Improvement District (WID) have been prioritized for both watershed and agricultural enhancement. This work has used an approach of structured combination and integration of local field knowledge and experience with a series of reference maps and tables, all of which draw on existing information and data.

A work session was held with Drayton WID members and technical staff of local agencies in February 2016, during which participants used maps to identify and prioritize the type and location of agricultural and watershed services that could potentially be enhanced on agricultural land where there is potential for mutual benefit to both agricultural and watershed systems.

Watershed analysis

The results of the watershed characterization and mapping for the Drayton WID include tables and summary maps which describe the watershed services that are most needed for a healthy watershed (including the restoration of salmon populations) and where they could be enhanced in the watershed.

In order to generate these tables and summary maps for the Drayton WID, the information contained in the watershed reference maps (see section 6 of the main report) was combined with the results of watershed characterization[7] (water flow assessments for WRIA 1, provided by the Department of Ecology in a series of maps showing the areas which are most in need of either restoration or protection of larger-scale water flow processes). The work session participants reviewed this information, provided additional local field knowledge on site-specific watershed priorities, and identified potential actions or projects that could help to achieve watershed priorities. A more detailed description of the watershed characterization methodology is provided in section 5 and Appendix C of the main report.

[5] Gill P (2013). *Agriculture-Watershed Characterization and Mapping Report for the North Lynden watersheds*. Prepared for the Whatcom County Agriculture-Watershed Pilot Project, Whatcom County Planning & Development Services, Bellingham. http://www.co.whatcom.wa.us/2260/Agricultural-Watershed-Pilot-Project

[6] Ag-Watershed Project fact sheets can be downloaded from http://whatcomcounty.us/2260/Agricultural-Watershed-Pilot-Project

[7] Watershed 'characterization' is a set of water and habitat assessments that compare areas within a watershed for restoration and protection value. It is a coarse-scale tool that supports decisions regarding where on the landscape should efforts be focused first, and what types of actions are most appropriate to that place. See http://www.ecy.wa.gov/puget_sound/characterization/index.html

Agricultural analysis

The results of the agricultural characterization and mapping for the Drayton WID include tables and summary maps which describe the agricultural services that are most needed for the long-term success of agriculture, and where they could be enhanced in the watershed. The primary focus was on the "natural infrastructure" for agriculture: soils, water, adequate drainage and flood protection, and long-term protection of the agricultural land base.

Methods used to prioritize agricultural needs are based on a combination of: information from (i) existing agricultural protection programs in Whatcom County, (ii) available GIS data contained in the agricultural reference maps (see section 6 of the main report) and (iii) local knowledge provided at the WID work session.

At the WID work session, participants assisted the project team to collate and evaluate information on agricultural system needs and priorities in the WID area, and to locate the different agricultural system needs and priorities on base maps of the WID area.

A more detailed description of the agricultural characterization methodology is provided in section 4 of the main report.

Application: How to use the results of the agriculture-watershed characterization and mapping

The WID can use the characterization maps and tables of agricultural and watershed priorities to support their land and water planning, management, and project funding.

The characterization maps and tables should help the WID to identify, prioritize, and strategically locate practical beneficial projects and actions at the farm or reach-scale, and to enhance agricultural operations and watershed functions in the WID area.

The characterization maps and tables should also help the WID identify project opportunities that enhance watershed processes while strengthening agriculture where agricultural and watershed priorities are complementary, and to find acceptable trade-offs where they compete.

These results, which incorporate local knowledge and farmer insights, may also be used to communicate the WIDs' priority enhancement needs to planners for consideration in broad scale planning such as Whatcom County's Comprehensive Planning process.

More information on how to use these results in planning can be found in the Ag-Watershed Project Fact Sheet 5, included as Appendix D of the main report.

Summarized results for the Drayton Watershed Improvement District

The summary table below (Table 1) and the summary maps in Figure 2 highlight the most significant watershed and agricultural enhancement opportunities within the Drayton WID area.

Check marks in Table 1 indicate where a specific enhancement priority was identified during the characterization and mapping process. Detailed descriptions of priorities, the sources of data and information on priorities, and descriptions of opportunities for enhancement through specific actions can be found in Tables 3 and 5 in the main report.

Table 1. Summary results of agriculture-watershed characterization and mapping for the Drayton WID
(See locality map in Figure 1 for locations of agriculture-watershed characterization areas)

Agriculture-Watershed Characterization Area	Dakota Creek South (Upper)	Dakota Creek South (Lower)	Dakota Creek North	Haynie Creek	California Creek (Upper)	Schneider Ditch (North)
Agricultural Enhancement Priority (See Table 3 in the main report for details)						
Prime agricultural Soils	ü	ü	ü	ü	ü	ü
Water quality for crops and livestock	-	-	-	-	ü	-
Water quantity	ü	ü	-	ü	ü	-
Agricultural drainage	-	ü	-	-	ü	-
Flood protection	-	-	-	-	ü	ü
Agricultural Land Base						
Important agricultural land	ü	ü	ü	ü	ü	ü
Protection from development pressure	-	ü	ü	ü	ü	ü
Other:	-	-	-	-	-	-
Watershed Enhancement Priority (See Table 5 in the main report for details)						
Water Quality						
Nutrients, Ammonia-N	-	-	-	-	-	-
Bacteria	-	ü	ü	-	ü	-
Temperature	-	-	-	-	-	-
Dissolved oxygen	-	-	ü	-	ü	-
Other:	-	-	-	-	ü (bioassessment)	-
Habitat						
Salmon spawning (current, documented)	-	-	ü	ü	ü	-
Anadromous fish	ü	ü	ü	ü	ü	-
Wildlife	-	-	-	-	ü	ü
Wetland	ü	ü	ü	-	ü	-
Water Flow Processes[8]						
Delivery	-	-	-	-	-	-
Discharge	-	ü	ü	ü	-	-
Recharge	-	ü	-	ü	-	-
Storage	-	-	-	ü	ü	-

[8] Check marks are shown in the summary table if the recommendation for any water flow process is indicated as highest restoration/restoration/highest protection/protection.

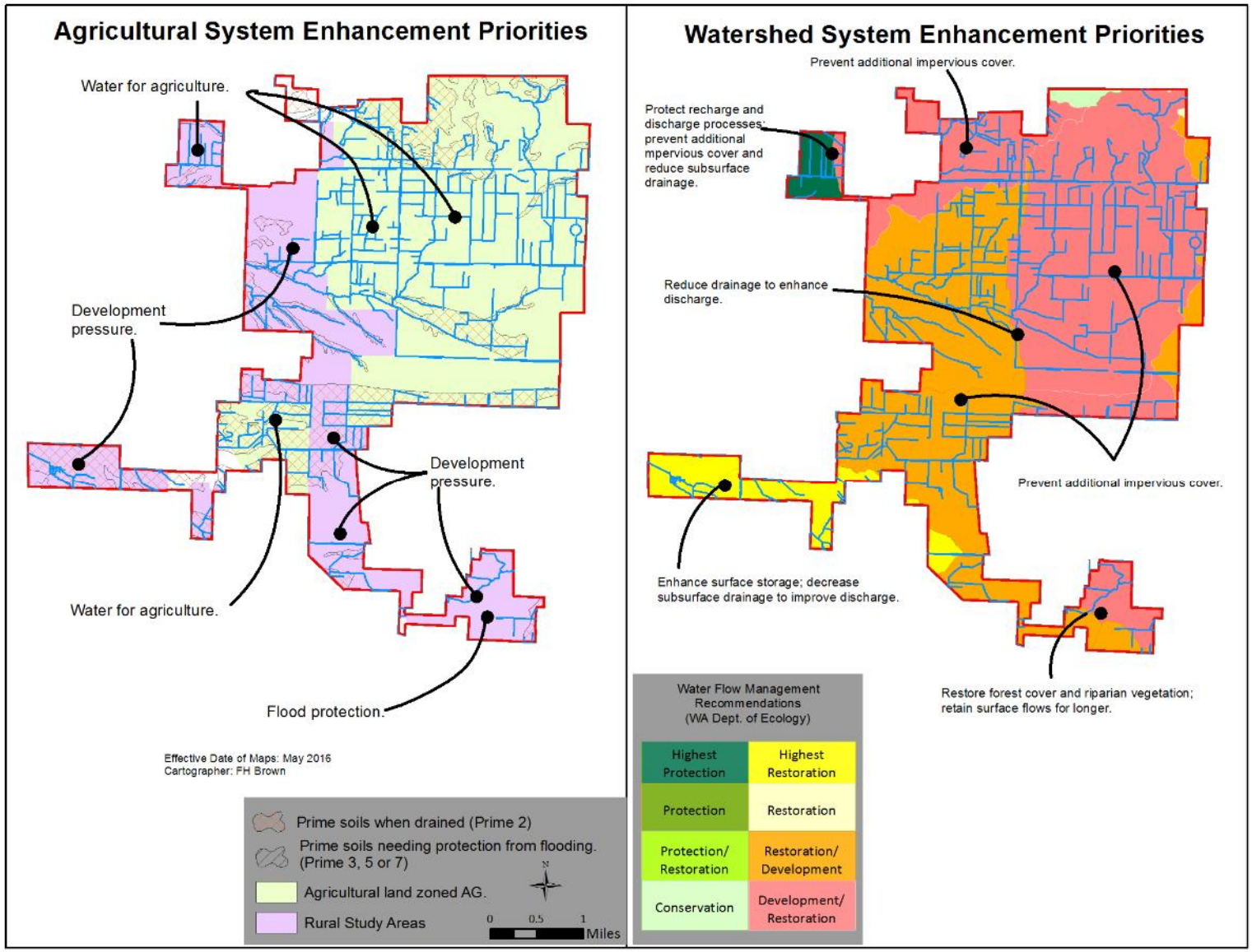


Figure 2. Drayton WID: Summary maps of agricultural and watershed enhancement priorities

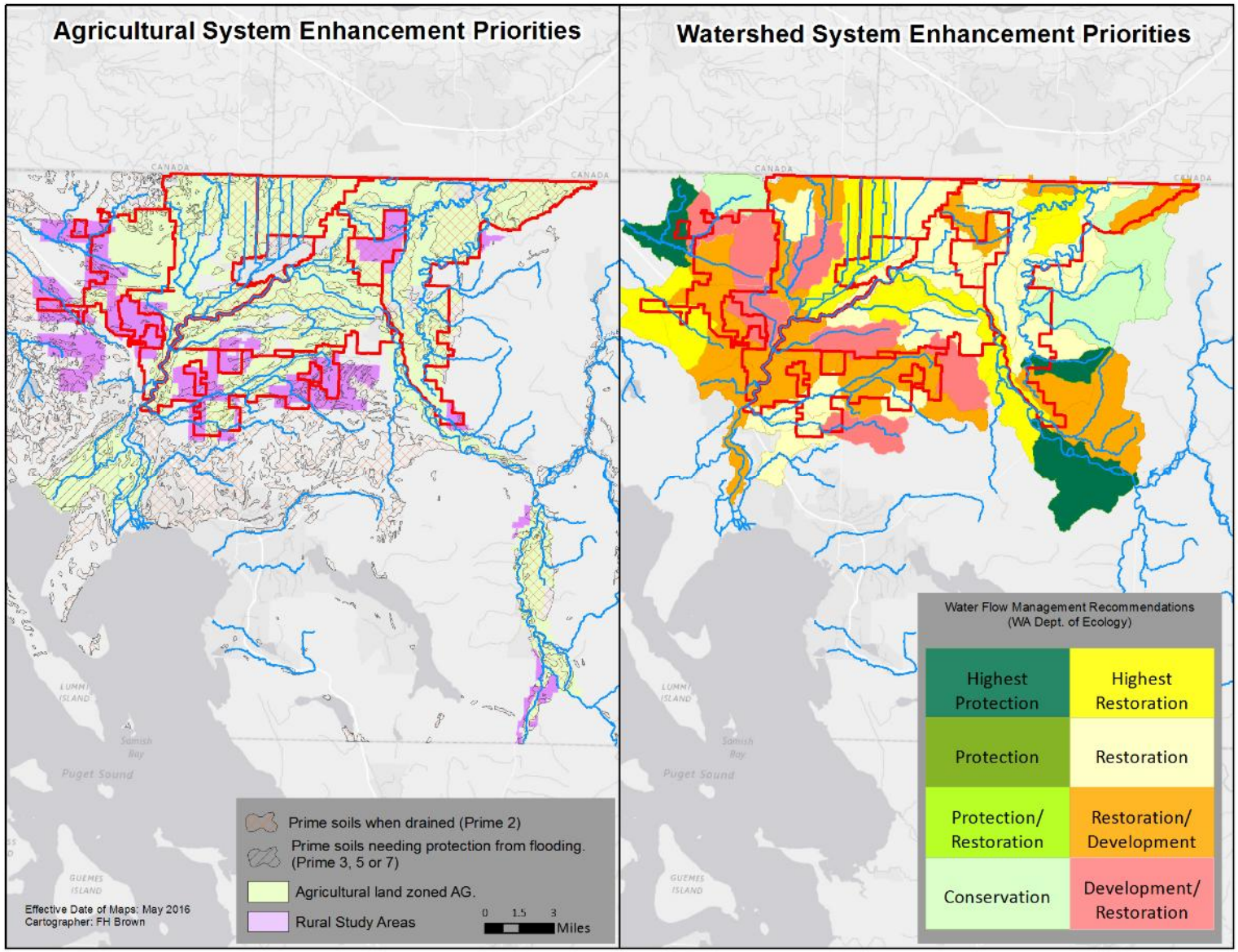


Figure 3. General agricultural and watershed enhancement priorities for the lowland areas of Whatcom County

Possible future challenges and priorities

Future challenges (1-10 years) may include issues listed below. See Table 1 for the full summary results of agriculture-watershed characterization and mapping for the Drayton WID.

- Water quantity: Access to legal irrigation water is a key priority (39 new applications have been filed in the WID area). Dakota Creek and California Creek are closed year-round to further appropriations unless mitigated. Restrictions on irrigation from creeks, tributaries, and other surface water sources are in place until instream flow levels are met during critical periods for fish per the existing Nooksack Instream Flow Rule.[9] Access to larger volumes of groundwater is constrained due to local hydrogeological characteristics. Some Group A public water suppliers do not have adequate water rights in suitable locations to meet projected future demand.[10]

- Protection of agricultural land from development pressure: The Drayton WID is mostly located on prime farmland soils, but the land is largely zoned Rural (R5-acre and R10-acre) instead of Agriculture (AG), is heavily parcelized and is vulnerable to conversion for low-density rural residential use.

- Water quality: Elevated fecal bacteria levels have been recorded both within the WID and in areas of the Drayton Harbor watershed outside the WID. This is of particular concern for the protection of commercial shellfish beds in Drayton Harbor. Potential sources include residential and commercial development, wildlife, livestock (both commercial and non-commercial).

- Drainage & flood management: Drainage is needed in some areas of the Drayton WID and flood protection in others. Maintaining the effectiveness of drainage ditches is important for drainage, flooding and water quality.

[9] WAC 173-501 (1985), Instream Resources Protection Program – Nooksack Water Resource Inventory Area 1.

[10] *Whatcom County Coordinated Water System Plan Update* (2016), http://www.whatcomcounty.us/1035/Coordinated-Water-System-Plan-Update

Appendix B: Agricultural and watershed characterization tables for the Drayton WID

Contains the detailed tables listing and describing agricultural and watershed enhancement priorities as discussed at the February 2016 work session of the Drayton WID. The tables are included in the full Agriculture-Watershed Characterization Report (2016) but are presented in this appendix for easy reference.

Source for these tables:
Whatcom County Agriculture-Watershed Pilot Project (2016). *Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District*. Whatcom County Planning & Development Services. https://www.Draytonwid.com/ [Alternative download <here>]

Table 1. Agricultural characterization tables for the Drayton WID

NOTE: Possible actions include: Specific actions identified by WID Actions Map # location (e.g. D1) and Area Units (AU), and General actions which do not have locations specified. Some of these actions do not appear on the WID Priority Actions Map due to: (i) action is general in description no location is noted; (ii) action is specific in description but no location noted; (iii) action is general in description, located outside the WID area; (iv) action is specific in description, located outside the WID.

3A. Agricultural Enhancement Priorities: Dakota Creek South Fork (Upper)							
	Water quantity: Irrig., stock, and processing	Water quality	Drainage	Flood protection	Land	Other	Possible actions
Dakota Creek South Fork (Upper) AU1115 Notes from reference maps and other documents:	10-25 new water rights applications in Upper Dakota (South) – See Ag Priorities maps: Water Quantity. Water quantity priority	*Note: There were no category 4 or 5 Department of Ecology listings in the 2012 Water Quality Atlas data. The 2016 update shows the mainstem Dakota Creek and a tributary, Rebel Creek, are listed in category 5 for bacteria and DO.*[1]	<25% of soils are prime if drained – see Ag Priorities maps: Drainage.	<5% of soil is prime if protected from flooding in Upper Dakota South – See Ag Priorities maps: Flooding.	95% of soils are prime 1-10 in Upper Dakota South. – See Ag Priorities maps: Prime Soils Prime soils priority 99% of land in Upper Dakota South is in AG Zoning. – See Ag Priorities maps: Ag Land Base Ag land base priority		
Dakota Creek South Fork (Upper) AU1115 Notes from work session in February 2016.	Irrigation water is limited; more is needed here.		Some drainage problems in early spring. Drainage ditch near Burk & Markworth Roads has clutter from trees, needs better maintenance for drainage flow. Noted as an action in the Bertrand WID report (B11/51 in AU1108)		Agricultural land north of Badger Road is rocky and not easy to till. Higher value agricultural land is south of Badger Road. Currently not much development pressure on land in this area.	High value potatoes, berries, nursery & greenhouses in this area.	(D1/50) AU1115: Drainage: Drainage blocked by WDFW fish culvert then backs up surface water. Need soils dry, drained (D11/63) AU 1115 Drainage issue. More drainage outflow is needed at the county right of way. (D2/52) AU1115: Drainage: New ditch at Enterprise Road is filling in. (D3/53) AU 1115: Drainage: Whatcom County road ditch on Badger Rd (east of Sunrise Rd) sporadic cleaning of ditch not enough.

[1] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

3B. Agricultural Enhancement Priorities: Dakota Creek South Fork (Lower)							
	Water quantity: Irrigation, stock, and processing	Water quality	Drainage	Flood protection	Land	Other	Possible actions
Dakota Creek South Fork (Lower) AU1116 Notes from reference maps and other documents	10-25 new applications for water rights in Lower Dakota South – See Ag Priorities maps: Water Quantity Ag water quantity priority	Elevated iron in water likely originates in iron-manganese nodules known to exist in peat in the region.[2] *Note: There were no category 4 or 5 Department of Ecology listings in the 2012 Water Quality Atlas data. The 2016 update shows the mainstem of Dakota Creek is in category 5 for bacteria, DO, and temperature. An unnamed tributary is in category 5 for bacteria and DO.*[3]	<25% of soils are prime if drained.	<5% of soil is prime if protected from flooding and Dakota Creek in Lower Dakota South lies in 1:100-year flood zone – See Ag Priorities maps: Flooding	98% of land in Lower Dakota South is in Ag Zoning & RSAs. - See Ag Priorities maps: Ag Land Base Ag land base priority A Rural Study Area occupies most of this subbasin. – See Ag Reference maps: Ag Priority Areas Protection from development pressure is an ag priority 94% of soils are prime 1-10 in Lower Dakota South. – See Ag Priorities maps: Prime Soils Prime soils priority		
Dakota Creek South Fork (Lower) AU1116 Notes from work session in February 2016.	Berries are dependent on reliable water supply; irrigation is crucial to all agriculture here. Surface water flow rates are low. Surface water storage potential is limited in area southwest of Enterprise and Loomis Trail Roads.	Iron in ground-water near Loomis Trail Rd.	There are problem spots, but no drainage district in this area. Slower flow from the west of south fork Dakota. Loomis Trail ditch drains poorly. Wet spot south side of Badger Rd is spreading. School/DNR wooded property north of Loomis Trail drains toward Loomis Trail Rd, keeping this area boggy. Rip rap in the ditch along Sunrise Rd. impedes cleaning. Drainage outlets must be maintained. There is a wet area with beaver activity in new ditch north of South Fork Dakota Creek (west of Enterprise Rd). Beaver management is needed. Ag drainage priority In north part of this area, surface water drains from the north end towards Badger Road.		Residential area is Zoned R5 and there are some conflicts with neighbors. Increasing pressure for residential development from east side toward Sunrise Rd. Farmers want to see farming maintained. Participants open to programs to reduce Development Rights in Ag areas. Possibly allow higher density in rural zone where ag is not present - from I-5-west. Modern farm equipment not able to work rocky soils in northeast area even though designated as prime agricultural land.	Ease up on wetland regulations. Potential for forest fragmentation. Crops include berries, potatoes, dairies, nurseries, Along Enterprise Rd. there are more berries and potatoes as the ground is higher here. Animals are pastured on fields in winter, in the northern part between Sunrise and Delta Roads. Road design should be improved.	(D12/64) AU 1116 Drainage: Drainage needs to be maintained. (D13/65) AU 1116 Drainage: Wet area. Drainage needs improvement.

[2] Mitchell, RJ, Babcock RS, Hirsch H, McKee L, Matthews RA & Vanderspyen J (2005), *Water Quality: Abbotsford-Sumas Final Report*. Western Washington University. http://kula.geol.wwu.edu/rjmitch/Report_2005.pdf

[3] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

3C. Agricultural Enhancement Priorities: Dakota Creek (North Fork)							
	Water quantity: Irrigation, stock, and processing	Water quality	Drainage	Flood protection	Land	Other	Possible actions
Dakota Creek (North Fork) AU1118 Notes from reference maps and other documents	<3 new applications for water rights in Dakota North – See Ag Priorities maps: Water Quantity	A small section of Dakota Creek North is in category 5[4] for dissolved oxygen. *Note: The above is from Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows North Fork Dakota Creek in this section is listed in category 5 for bacteria, DO, and temperature.*[5]	<50% of soils are prime if drained. See Ag Priorities map: Drainage	<5% of soil is prime if protected from flooding. The lower section of Dakota Creek North Fork lies in 1:100-year flood zone but this area is outside the WID – See Ag Priorities maps: Flooding	29% of land in Dakota North Ag-Watershed Characterization Area is in Ag Zoning & RSAs. However, most of the area of Dakota North within the Drayton WID is AG zoning or Rural Study Area. See Ag Priorities maps: Ag Land Base, and Ag Reference map: Agriculture Priority Areas. Ag land base priority Protection from development pressure is an ag priority 85% of soils are prime 1-10 in Dakota North area – See Ag Priorities maps: Prime Soils Prime soils priority		
Dakota Creek (North Fork) AU1118 Notes from work session in February 2016.	Not much groundwater available - deep wells are low producing (70gpm).	Animals on the fields in the winter can create water quality issues if pastures are overstocked.			North of the WID boundary is mostly Rural zoning.		

[4] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html (Accessed March 28, 2016)

[5] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

3D. Agricultural Enhancement Priorities: Haynie Creek							
	Water quantity: Irrigation, stock, and processing	Water quality	Drainage	Flood protection	Land	Other	Possible actions
Haynie Creek AU1119 Notes from reference maps and other documents	3 new applications for water rights in Haynie – See Ag Priorities maps: Water Quantity Ag water quantity priority	A section of Dakota Creek in Haynie is in category 5 for DO and bacteria.[6] *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows the section of Dakota Creek within Haynie subbasin is in category 5 for bacteria, DO, and temperature and Haynie Creek is in category 5 for bacteria and DO.*[7]	<25% of the soils in this area are prime if drained.	<5% of soil is prime if protected from flooding. Haynie Creek at the confluence with Dakota Creek lies in 1:100-year flood zone, but this is outside the WID – See Ag Priorities maps: Flooding	38% of land in Haynie Ag-Watershed Characterization Area is in Ag Zoning & RSAs, but the entire portion that is within Drayton WID is important agricultural land. - See Ag Priorities map: Ag Land Base and Ag Reference map: Ag priority areas Ag land base priority An RSA occupies the southern portion of this subbasin. – See Ag Reference maps: Ag priority areas Protection from development pressure is an ag priority 59% of soils are prime 1-10 in Haynie Ag-Watershed Characterization Area, but in the portion within Drayton WID, almost all soils are prime. – See Ag Priorities maps: Prime Soils Prime soils priority		
Haynie Creek AU1119 Notes from work session in February 2016.	Low surface water flows in summer.						D14/66) AU 1119 Drainage re-routed in the area, used to flow west direct, now jogs south west through woodlot to Haynie Creek. (D17/68) AU 1119 Flooding: Beaver activity causing flooding.

[6] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html (Accessed March 28, 2016)

[7] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

3E. Agricultural Enhancement Priorities: Upper California Creek							
	Water quantity: Irrigation, stock, and processing	Water quality	Drainage	Flood protection	Land	Other	Possible actions
Upper California Creek AU1113 AU1122 AU1123 AU1124 AU1125 Notes from reference maps and other documents	2 new applications for water rights in Upper California – See Ag Priorities maps: Water Quantity Ag water quantity priority	A section of California Creek in Upper California is in category 5 for DO and bioassessment.[8] *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows the section of California Creek within the WID is in category 5 for bacteria, DO, and temperature.*[9] Elevated iron in water likely originates in iron-manganese nodules known to exist in peat in the region.[10]	<50% of soils in the Upper California Ag-Watershed Characterization Area are prime if drained, but in the portion that is within the Drayton WID, most soils are prime if drained. Drainage Improvement Districts #7 and #17 are located within the Upper California subbasin.[11] See Ag reference map: Prime soils. Ag drainage priority	<5% of soil is prime if protected from flooding in Upper California – See Ag Priorities maps: Flooding	58% of land in Upper California is in Ag Zoning & RSAs. - See Ag Priorities maps: Ag Land Base Ag land base priority Rural Study Area occupies most of this subbasin. – See Ag Reference maps: Ag Priority Areas Protection from development pressure is an ag priority 83% of soils are prime 1-10 in California Upper. – See Ag Priorities maps: Prime Soils Prime soils priority		
Upper California Creek AU1113 AU1122 AU1123 AU1124 AU1125 Notes from work session in February 2016.	Irrigation is needed on drier soils on high ground. There is insufficient surface water in summer to satisfy water rights. Groundwater rights are desirable.	High iron concentrations in groundwater in some areas. Groundwater quality may not be suitable for livestock. Ag water quality priority	If reed canary grass is controlled, then drainage is fairly good. Poor drainage around Wiley Lake Road due to peat soils and high water table. Winter flooding on fields near Ham Rd. Many beaver dams on California Creek. Small tiles drain the area east of I-5 at Harksell Rd. No flow around Wiley Lake Rd. Sand mine in the area contributes to wet spot.	Beaver are very active north of WID boundary at California Creek and the big woods west of Valley View Rd. Increased runoff attributed to residential development to the west (Ferndale development along Fox Road). Ditches are insufficient to handle it. In general the area is pretty flat, so any beaver dams will create flooding. Some areas flood in winter and early spring. Railroad is fixing some culverts which will help. Flood protection priority	Participants reported only one residential complaint. Prime ag soils on high ground along Delta Line Road.		(D4/54) AU1125 Drainage: Clogged culvert. (D5/55) AU 1125: Drainage: Beaver problems in wooded area south of California Creek (iii) (D15/56) AU1123: Flooding: Water over Valley View Rd for 1-2 months. (D6/57) AU 1123. Drainage: Blocked railroad culvert. (D7/58) AU 1122. Drainage: Blocked railroad culvert. (D16/59) AU 1122: Flooding: Beaver dams on California Creek affect people on Old Hwy 99 (iii) (D8/60) AU 1122: Drainage: Poor drainage causes houses here to flood (iii) (D9/61) AU 1124: Drainage: Peat soils, drainage required.

[8] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html (Accessed March 28, 2016)

[9] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

[10] Mitchell, RJ, Babcock RS, Hirsch H, McKee L, Matthews RA & Vanderspyen J (2005), *Water Quality: Abbotsford-Sumas Final Report.* Western Washington University. http://kula.geol.wwu.edu/rjmitch/Report_2005.pdf

[11] WCD (2014), *Agricultural Drainage for Drainage Districts.* http://www.whatcomcd.org/ag-drainage-districts [last accessed March 28, 2015]

3F. Agricultural Enhancement Priorities: Schneider Ditch (North)							
	Water quantity: Irrigation, stock, and processing	Water quality	Drainage	Flood protection	Land	Other	Possible actions
Schneider Ditch North AU1109 & small portion of AU1112 Notes from reference maps and other documents	1 new application for water rights in Schneider North – See Ag Priorities maps: Water Quantity	Sections of Schneider Ditch, also known as Keefe Lake Outlet, are in category 5[12] for DO, and category 4a[13] for bacteria. *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows Schneider Ditch, also known as Keefe Lake Outlet, is listed in category 5 for dissolved oxygen, pH, and temperature, and listed in category 4a for bacteria .*[14]	<25% of soils in Schneider North Ag-Watershed Characterization Area are prime if drained. Drainage District #2 is located within the Schneider North subbasin.[15]	<5% of soil is prime if protected from flooding, but much of the Schneider North area lies in floodway and 1:100-year flood zone – See Ag Priorities maps: Flooding Ag flood protection priority	100% of land in Schneider North is in Ag Zoning & RSAs. – See Ag Priorities maps: Ag Land Base Ag land base priority A Rural Study Area occupies most of this subbasin. – See Ag Reference maps: Ag priority areas Protection from development pressure is an ag priority 97% of soils are prime 1-10 in Schneider North. – See Ag Priorities maps: Prime Soils Prime soils priority		
Schneider Ditch North AU1109 & small portion of AU1112 Notes from work session in February 2016.			There are drainage problems in Bertrand WID south of Dalhberg Rd at Nooksack Mainstem. (added as Action B12 in Bertrand WID).				D10/62) AU 1109 Drainage: Beaver activity is plugging drainage tiles, water going under road near Woodland Rd.(iii)

[12] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html (Accessed March 28, 2016)

[13] Category 4a - has a TMDL: water bodies that have an approved TMDL in place and are actively being implemented. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html [last accessed March 28, 2016]

[14] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

[15] WCD (2014), *Agricultural Drainage for Drainage Districts.* http://www.whatcomcd.org/ag-drainage-districts

Table 2. Watershed characterization tables for the Drayton WID

NOTE: Possible actions include: Specific actions identified by WID Actions Map # location and Assessment Units (AU), and General actions which do not have locations specified. Some of these actions do not appear on the WID Priority Actions Map due to: (i) action is general in description no location is noted; (ii) action is specific in description but no location noted; (iii) action is general in description, located outside the WID area; (iv) action is specific in description, located outside the WID.

5A. Watershed Enhancement Priorities: Dakota Creek South Fork (Upper)				
	Wildlife habitat	Salmonid habitat	Water quality	Summary & potential for enhancement
Upper Dakota Creek (South) AU1115 Notes from reference maps and other documents	Critical Habitat: Wetland (See Watershed reference map: Priority Habitats & Species)	Chum, coho, cutthroat[16] (See Watershed reference map: Fish presence & fish barriers)	No impairments listed for this area. *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows the mainstem Dakota Creek and a tributary, Rebel Creek, are listed in category 5 for bacteria and DO.*[17]	<u>Results of PSWC water flow assessment:</u> An area of moderate importance for delivery, discharge and recharge processes. No water quality impairments listed. <u>Summary & potential for enhancement</u>: Overall water flow processes are highly degraded, especially discharge and surface storage processes. Although this is an area of relatively low importance for water flow processes overall, recharge processes are still relatively intact compared to other parts of this watershed. Actions should focus on protecting existing vegetated cover and preventing new impervious cover in order to maintain recharge processes.
Upper Dakota Creek (South) AU1115 Notes from February 2016 work session	Note Enterprise restoration project.			

[16] Fish Habitat Technical Team (2004), WRIA 1 Watershed Management Project. Data provided by Sarah Watts, Whatcom County Planning & Development Services.

[17] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

5B. Watershed Enhancement Priorities: Dakota Creek South Fork (Lower)				
	Wildlife habitat	Salmonid habitat	Water quality	Summary & potential for enhancement
Dakota Creek South Fork (Lower) AU1116 Notes from reference maps and other documents	Critical Habitat: Wetland (See Watershed reference map: Priority Habitats & Species)	Chum, coho, cutthroat[18] (See Watershed reference map: Fish presence & fish barriers)	No impairments listed. However, routine monitoring results indicate elevated fecal bacteria levels in the period 2013-2016 in this reach of Dakota Creek (see Figure 28 Watershed reference map: Routine water quality monitoring results.) *Note: There were no category 4 or 5 Department of Ecology listings in the 2012 Water Quality Atlas data. The 2016 update shows the mainstem of Dakota Creek is in category 5 for bacteria, DO, and temperature. An unnamed tributary is in category 5 for bacteria and DO.*[19]	<u>Results of PSWC water flow assessment:</u> An area of moderately high importance for discharge and recharge processes. <u>Summary & potential for enhancement</u>: No water quality impairments listed. Overall water flow processes are moderately to highly degraded. This is an area of moderate importance for water flow processes overall. Actions should focus on restoring recharge and discharge processes by reducing impervious cover and preventing additional impervious cover, and by decreasing the rate and quantity of subsurface water drainage.
Dakota Creek South Fork (Lower) AU1116 Notes from February 2016 work session	Wetland: area with trees has been impaired by diking up into the trees. Can groundwater recharge activities co-exist with farming in the ponded area near Enterprise Road?			

[18] Fish Habitat Technical Team (2004), WRIA 1 Watershed Management Project. Data provided by Sarah Watts, Whatcom County Planning & Development Services.
[19] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

5C. Watershed Enhancement Priorities: Dakota Creek North Fork				
	Wildlife habitat	Salmonid habitat	Water quality	Summary & potential for enhancement
Dakota Creek North AU1118 & small portion of AU1117 Notes from reference maps and other documents	Critical Habitat: Wetland (See Watershed reference map: Priority Habitats & Species)	Chum, coho, cutthroat[20] (See Watershed reference map: Fish presence & fish barriers) Documented fall Chinook, coho, fall chum, & winter steelhead spawning in N. Fork Dakota Creek[21]	A section of N.F. Dakota Creek is in category 5[22] for DO.[23] *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows North Fork Dakota Creek in this section is listed in category 5 for bacteria, DO, and temperature.*[24] Routine monitoring results indicate elevated fecal bacteria levels in the period 2013-2016 in this reach of Dakota Creek (see Figure 28 Watershed reference map: Routine water quality monitoring results.)	Results of PSWC water flow assessment: AU1118: An area of moderately high importance for discharge and moderate importance for delivery and recharge processes. Overall water flow processes are moderately degraded. AU1117: An area of moderately high importance for delivery. Low importance for all other water flow processes. Overall water flow processes are moderately degraded. Summary & potential for enhancement: There are water quality impairments listed for dissolved oxygen in North Fork Dakota Creek. Although this area is of relatively low importance for water flow processes overall, recharge processes are still fairly intact. Actions should focus on protecting and restoring recharge processes by reducing impervious cover and preventing additional impervious cover.
Dakota Creek North AU1118 & small portion of AU1117 Notes from February 2016 work session		Documented fall Chinook, coho, fall chum, & winter steelhead spawning in N. Fork Dakota Creek[25]	Backup of water at South Fork and North Fork is stagnant. Testing site here captures high fecal.	Monitor conditions at the confluence of North & South Fork for potential water quality problems.

[20] Fish Habitat Technical Team (2004), WRIA 1 Watershed Management Project. Data provided by Sarah Watts, Whatcom County Planning & Development Services.
[21] WDFW (n.d.), *SalmonScape* [interactive webmap] <http://apps.wdfw.wa.gov/salmonscape/> [last accessed May 09, 2016]
[22] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/wqAssessmentCats.html (Accessed March 28, 2016)
[23] Ecology (2012), *Water Quality Assessment for Washington* http://www.ecy.wa.gov/programs/Wq/303d/index.html
[24] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html
[25] WDFW (n.d.), *SalmonScape* [interactive webmap] <http://apps.wdfw.wa.gov/salmonscape/> [last accessed May 09, 2016]

5D. Watershed Enhancement Priorities: Haynie Creek				
	Wildlife habitat	Salmonid habitat	Water quality	Summary & potential for enhancement
Haynie Creek AU1119 Notes from reference maps and other documents	Critical Habitat: None.	Coho[26] (See Watershed reference map: Fish presence & fish barriers) Documented fall Chinook, coho, fall chum, & winter steelhead spawning in Haynie and Dakota Creek in this AU[27]	No listings in Haynie Creek, but a section of Dakota Creek at the confluence with Haynie Creek (outside the Drayton WID area) is in category 5[28] for DO and bacteria.[29] *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows Haynie Creek is in category 5 for bacteria and DO, and the section of Dakota Creek within Haynie subbasin is in category 5 for bacteria, DO, and temperature.* [30]	Results of PSWC water flow assessment: An area of high importance for discharge and moderate high importance for recharge and storage processes. Summary & potential for enhancement: Overall water flow processes are moderately degraded but this area is of highest importance especially for discharge and recharge processes which remain relatively intact. Actions should focus on protecting and maintaining recharge processes by preventing additional impervious cover and reducing the amount of existing impervious cover. Consider actions to restore delivery processes by reducing the rate and quantity of subsurface water drainage.
Haynie Creek AU1119 Notes from February 2016 work session		Good salmon habitat in this area.		AU 1119. Provide refuge habitat (deep pools) to allow fish to survive low flow periods, outside the WID area to the north – Participant comments from WID work session.

[26] Fish Habitat Technical Team (2004), WRIA 1 Watershed Management Project. Data provided by Sarah Watts, Whatcom County Planning & Development Services.
[27] WDFW (n.d.) *SalmonScape* [interactive webmap] <http://apps.wdfw.wa.gov/salmonscape/> [last accessed May 09, 2016]
[28] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/wqAssessmentCats.html (Accessed March 28, 2016)
[29] Ecology (2012), *Water Quality Assessment for Washington* http://www.ecy.wa.gov/programs/Wq/303d/index.html
[30] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

5E. Watershed Enhancement Priorities: California Creek (Upper)				
	Wildlife habitat	Salmonid habitat	Water quality	Summary & potential for enhancement
California Creek AU1122 AU1123 AU1124 AU1125 Notes from reference maps and other documents	Critical Habitat: Wetland, Band tailed Pigeon (See watershed reference map: Priority Habitats and Species)	Coho, cutthroat, & steelhead[31] Documented coho spawning[32]	Sections of California Creek in AU1123 are in category 5 for DO and bioassessment.[33] A section of California Creek in AU1125 is in category 5 for bacteria.[34] *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows the section of California Creek within the WID is in category 5 for bacteria, DO, and temperature.*[35] Routine monitoring results indicate elevated fecal bacteria levels in the period 2013-2016 in the reach of California Creek within AU1123 and upstream (see Figure 28 Watershed reference map: Routine water quality monitoring results.)	Results of PSWC water flow assessment: AU1122: An area of high importance for discharge and moderate importance for surface storage. AU1123: An area of high importance for discharge and surface storage processes. There are impairments listed for dissolved oxygen, bacteria and for bioassessment in California Creek. AU1124: An area of high importance for surface storage and moderate importance for discharge. Overall water flow processes are highly degraded. AU1125: An area of high importance for surface storage and discharge processes. Overall water flow processes are moderately to highly degraded. Summary & potential for enhancement: Overall water flow processes are moderately high to highly degraded, especially discharge and surface storage. Much of this area is of high importance for water flow processes overall. Actions should focus on restoring discharge and storage processes, by decreasing the rate and quantity of subsurface water drainage while also looking for opportunities in the landscape to retain surface flows for longer.
California Creek AU1122 AU1123 AU1124 AU1125 Notes from February 2016 work session	No notes were added at the February 2016 work session.			

[31] Fish Habitat Technical Team (2004), WRIA 1 Watershed Management Project. Data provided by Sarah Watts, Whatcom County Planning & Development Services.
[32] WDFW (n.d.) SalmonScape [interactive webmap] <http://apps.wdfw.wa.gov/salmonscape/> [last accessed May 09, 2016]
[33] Ecology (2012) *Water Quality Assessment for Washington.* http://www.ecy.wa.gov/programs/Wq/303d/index.html
[34] Ecology (2012), *Water Quality Assessment for Washington.* http://www.ecy.wa.gov/programs/Wq/303d/index.html
[35] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

5F. Watershed Enhancement Priorities: Schneider Ditch (North)				
	Wildlife habitat	Salmonid habitat	Water quality	Summary & potential for enhancement
Schneider Ditch North AU1109 & small portion of AU1110 Notes from reference maps and other documents	Critical Habitat: Band-tailed pigeon (See watershed reference map: Priority Habitats and Species)	None in the area of Schneider Ditch North that is within the Drayton WID.	Sections of Schneider Ditch, also known as Keefe Lake Outlet, are in category 5[36] for DO, and category 4a[37] for bacteria. *Note: The above is from the Department of Ecology 2012 Water Quality Atlas data. The 2016 update shows Schneider Ditch, also known as Keefe Lake Outlet, is listed in category 5 for dissolved oxygen, pH, and temperature, and listed in category 4a for bacteria .*[38]	Results of PSWC water flow assessment: Degradation of overall water flow processes is moderate-high, with surface storage and delivery processes in particular being highly degraded. However, this area is of relatively low importance for water flow processes overall in the watershed. Summary & potential for enhancement: Protection and restoration of forest cover and riparian vegetation in this area would help to improve delivery processes. Investigate opportunities to increase surface storage and retain surface flows for longer in this area.
Schneider Ditch North AU1109 & small portion of AU1110 Notes from February 2016 work session				

[36] Category 5 - Polluted waters that require a TMDL (total maximum daily load) or other WQI (water quality Improvement) project: the traditional list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2008 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html (Accessed March 28, 2016)

[37] Category 4a - has a TMDL: water bodies that have an approved TMDL in place and are actively being implemented. WA Department of Ecology, 2015. *Water Quality Assessment Categories.* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html [last accessed March 28, 2016]

[38] Ecology (2016), *Water Quality Assessment for Washington*. http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html

Appendix C: Selected Reference Maps for the Drayton WID

Contains a selection of reference maps related to the Drayton watershed and various WID priorities. Most of the maps in this appendix were also included in the 2016 Agriculture-Watershed Characterization and Mapping Report, and are appended here for readers' convenience. Figure and page numbers for these maps are unchanged from the original report.

Source for these maps:
Whatcom County Agriculture-Watershed Pilot Project (2016). *Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District*. Whatcom County Planning & Development Services. https://www.Draytonwid.com/ [Alternative download <here>]

In future technical work associated with the WID's management plan, these maps might be updated or refined to include more detail as required for baseline studies and development of an action plan.

Maps included in this appendix:

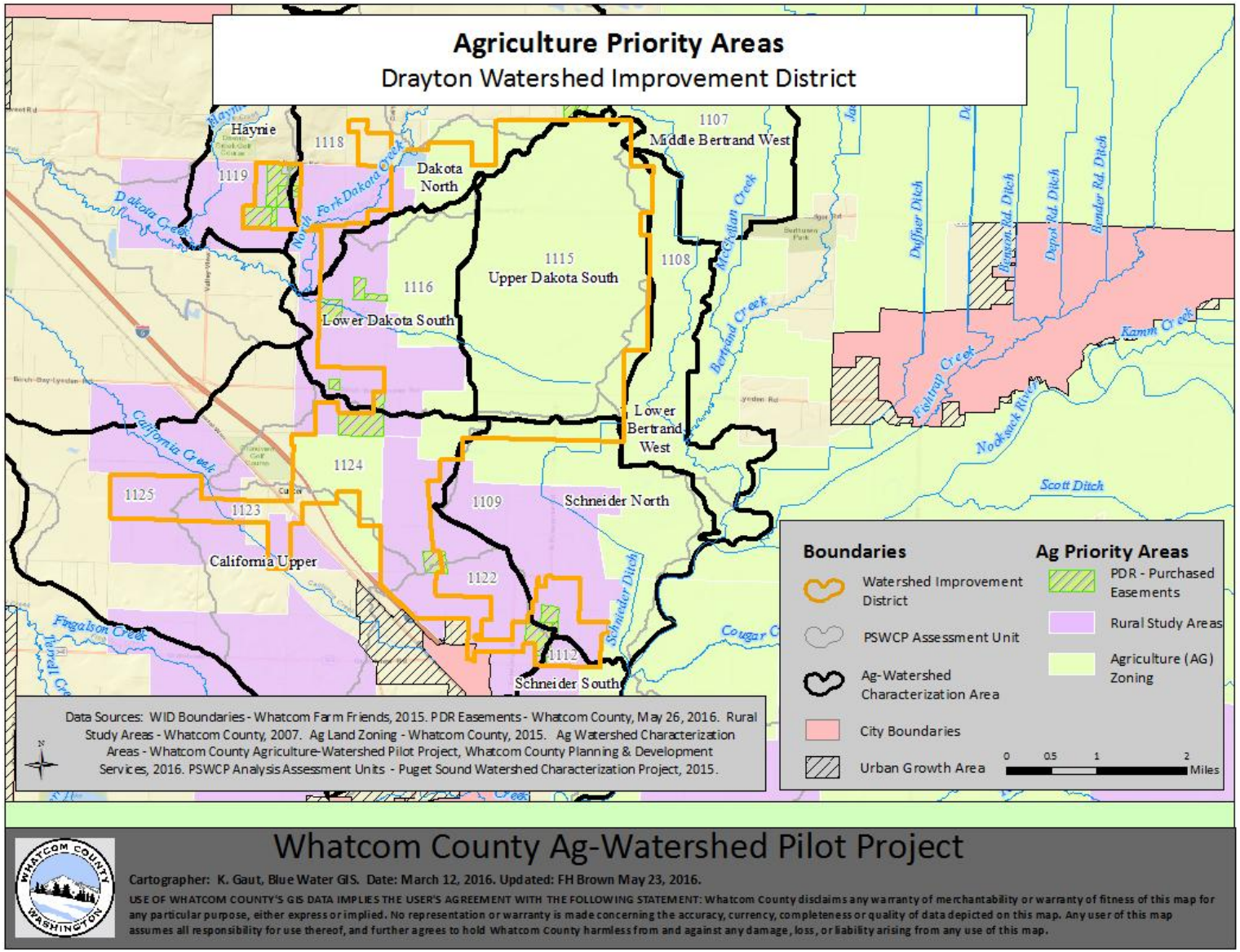


Figure 17. Drayton WID Reference map: Agriculture priority areas

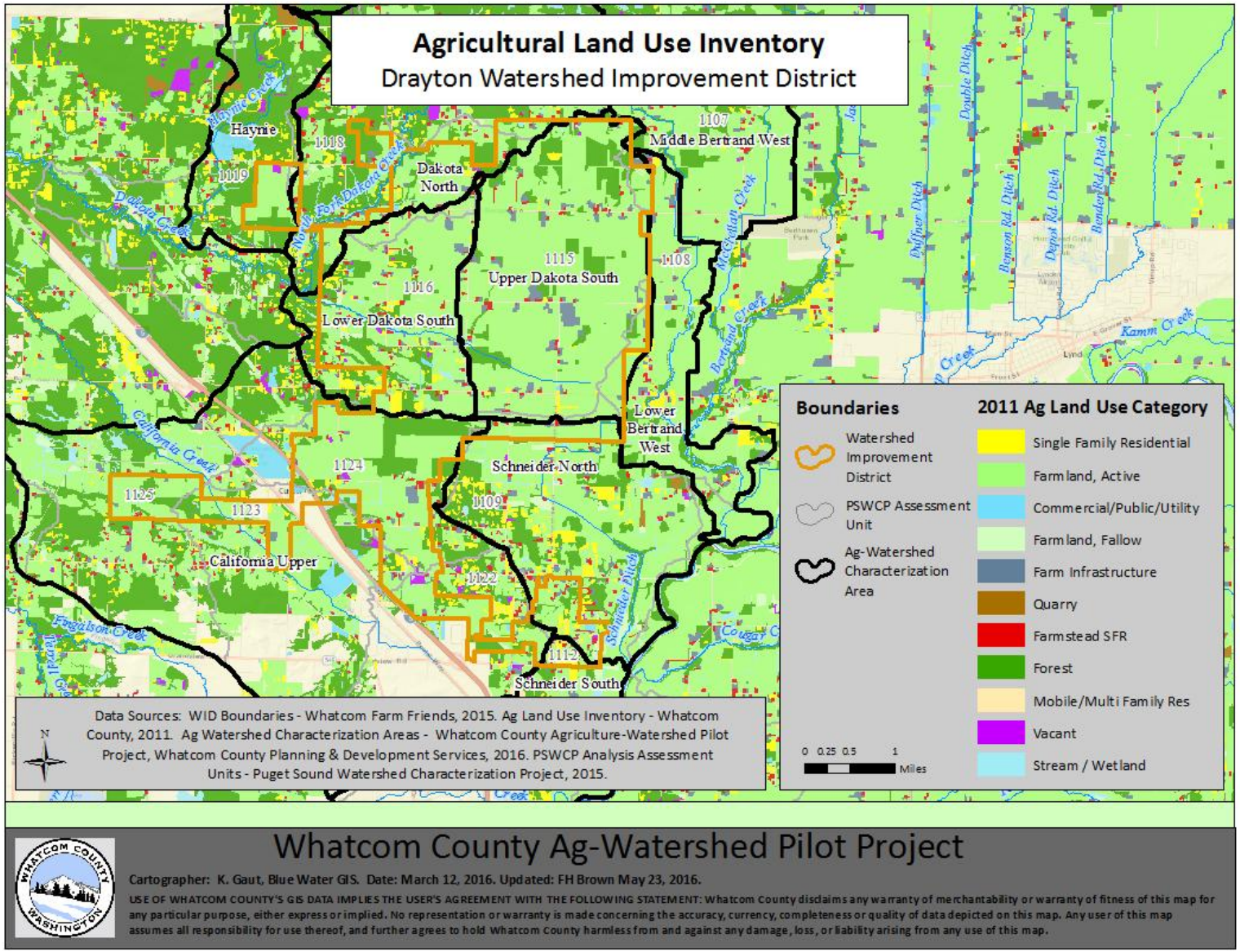


Figure 18. Drayton WID Reference map: Agricultural land use inventory

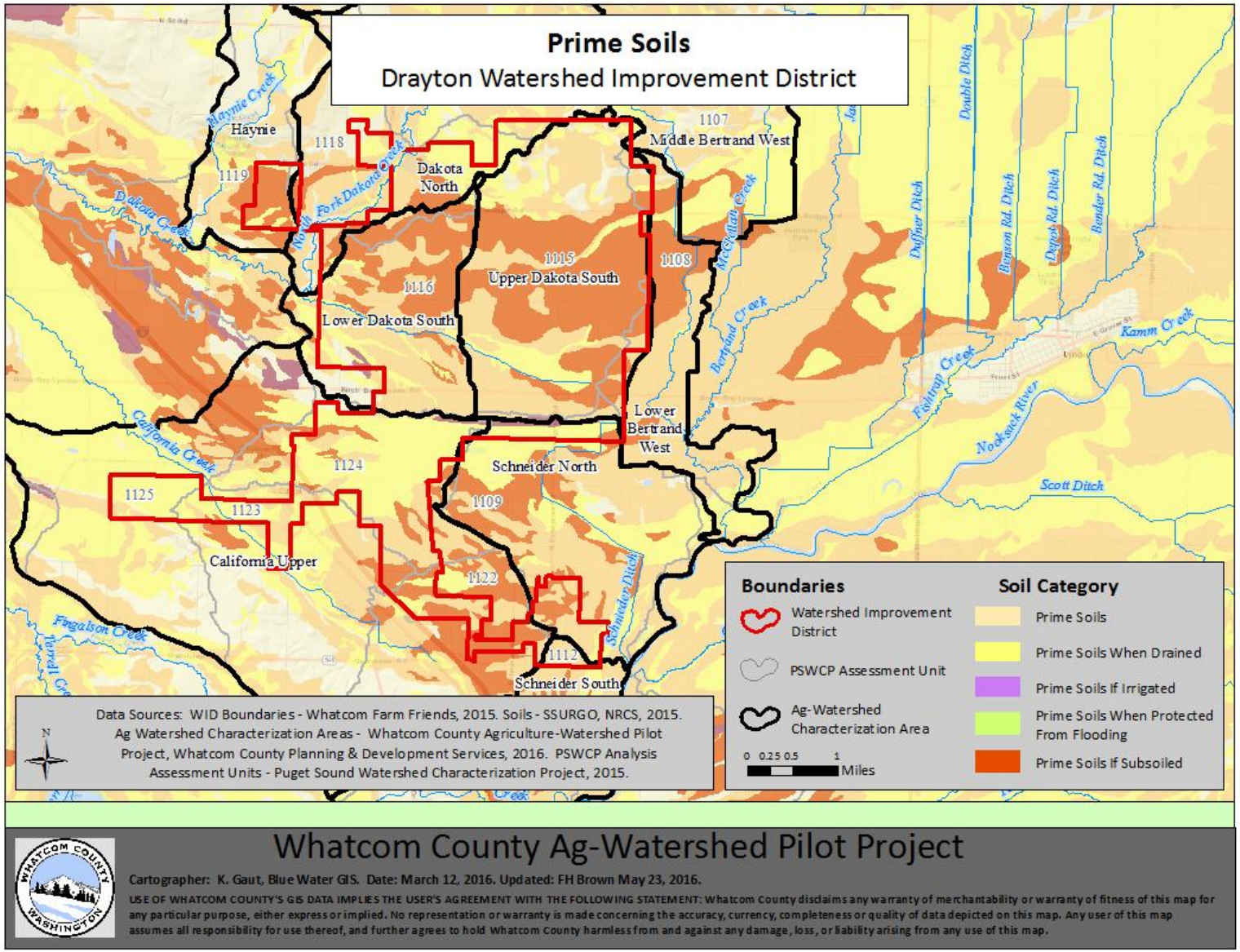


Figure 19. Drayton WID Reference map: Prime soils

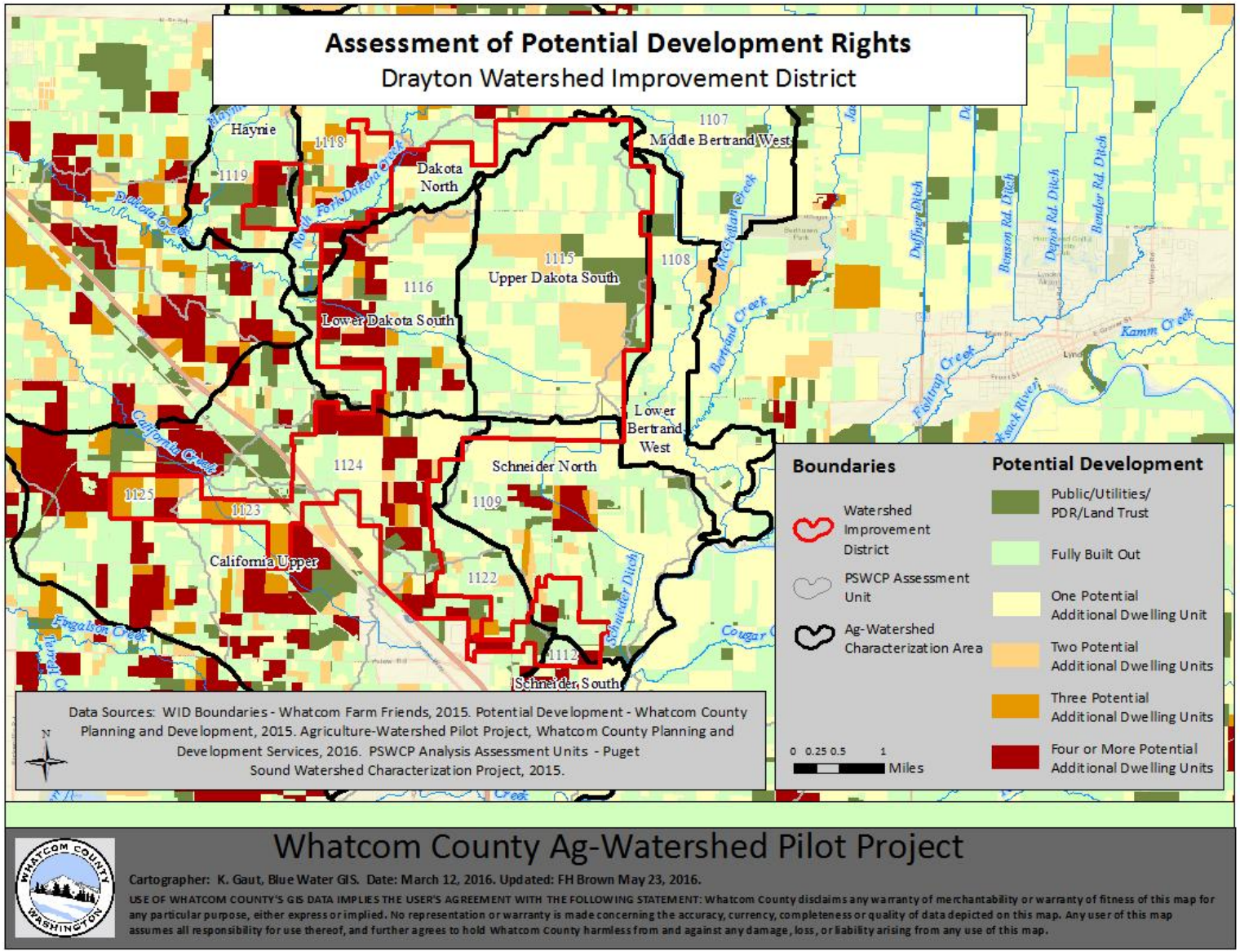


Figure 20. Drayton WID Reference map: Assessment of potential development rights

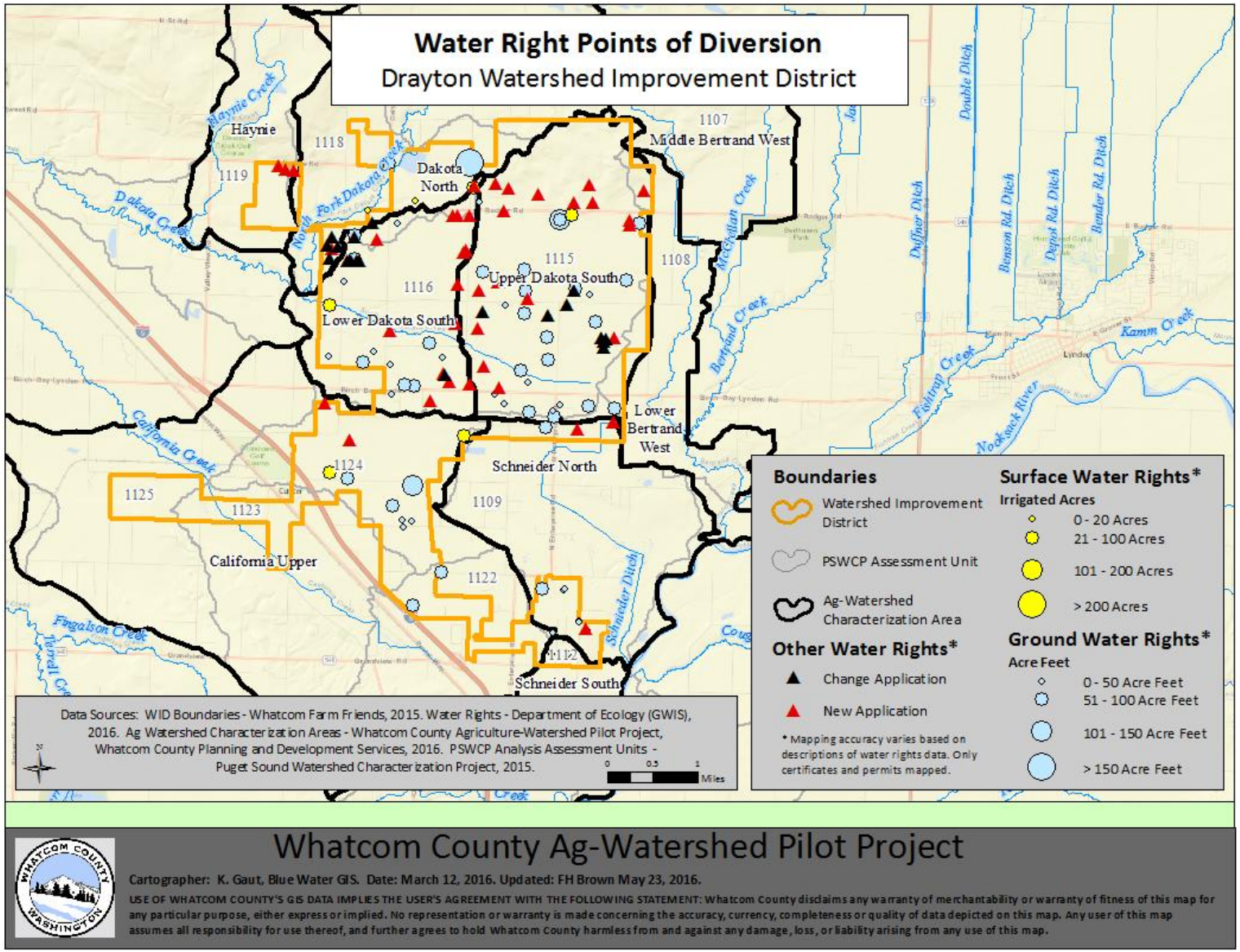


Figure 21. Drayton WID Reference map: Water right points of diversion

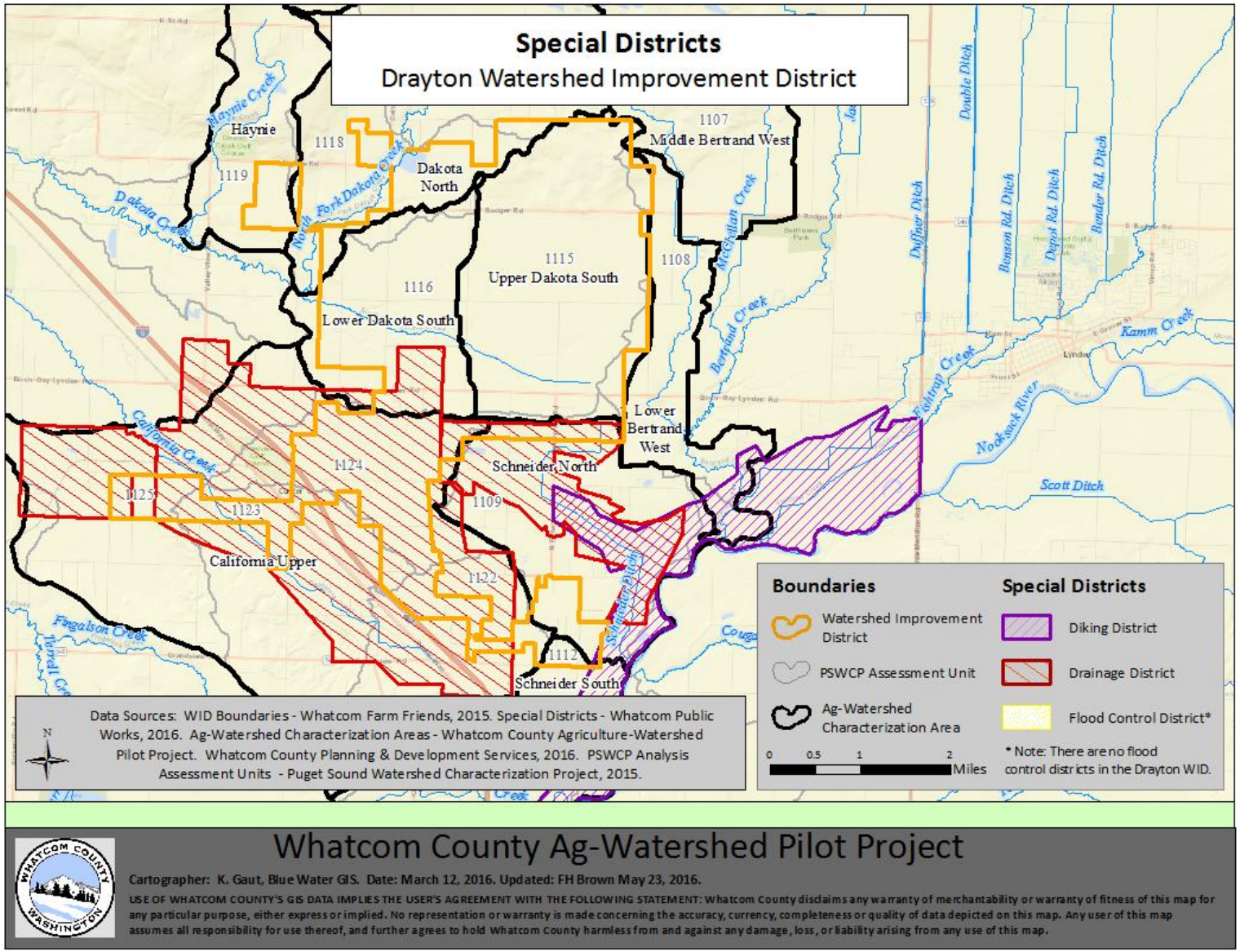


Figure 22. Drayton WID Reference map: Special districts

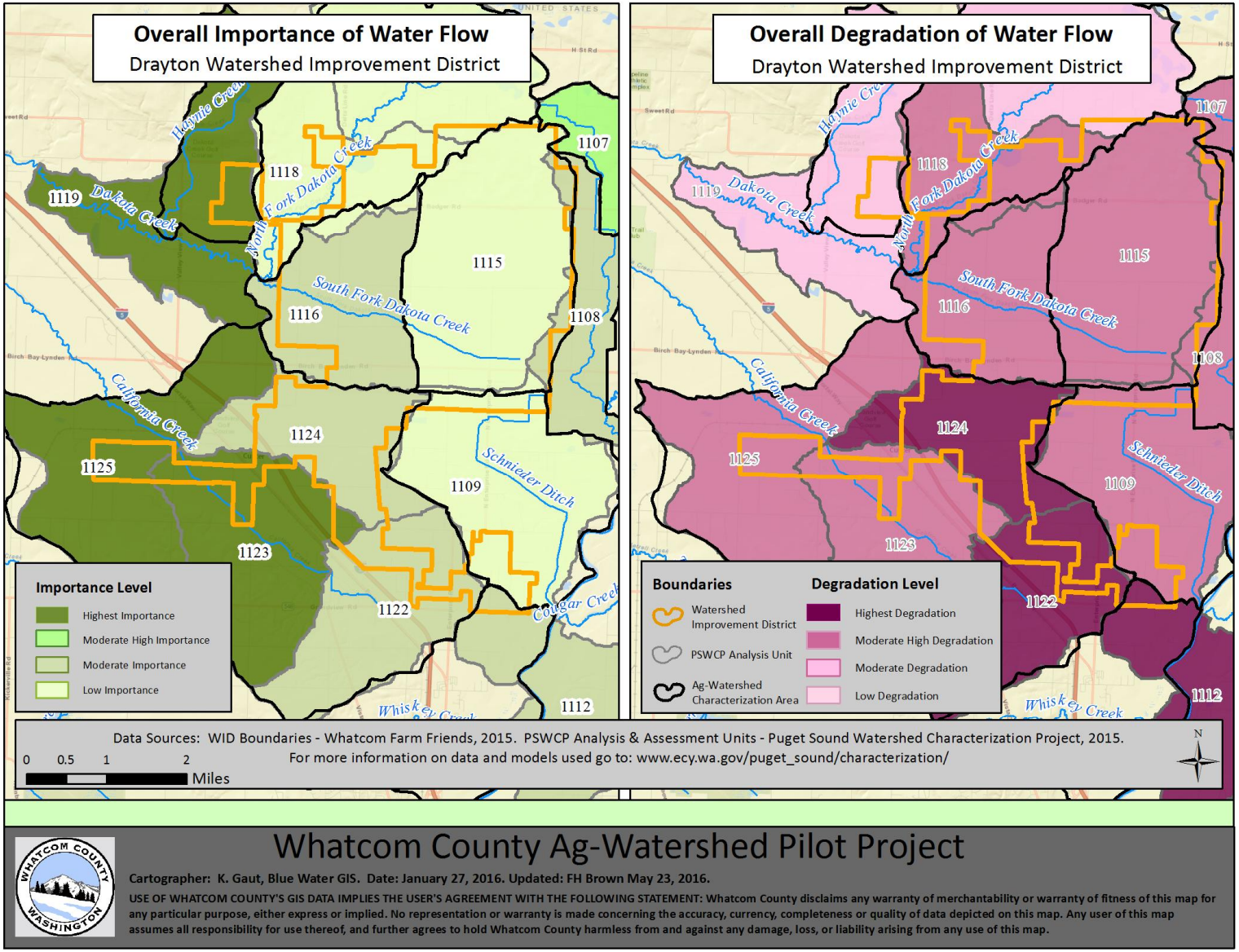


Figure 14. Drayton WID: Overall importance and degradation of water flow processes

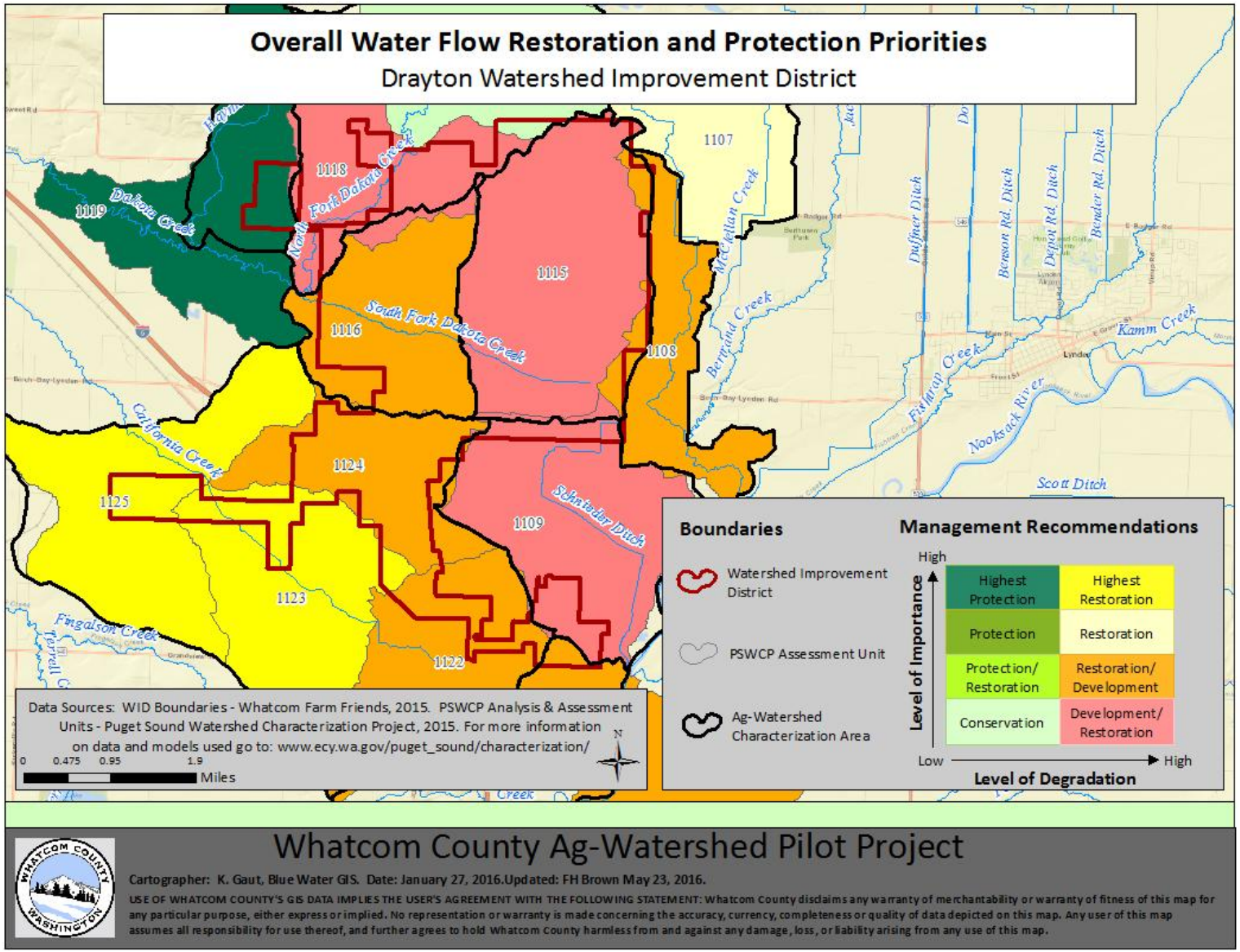


Figure 15. Drayton WID: Overall water flow protection and restoration priorities

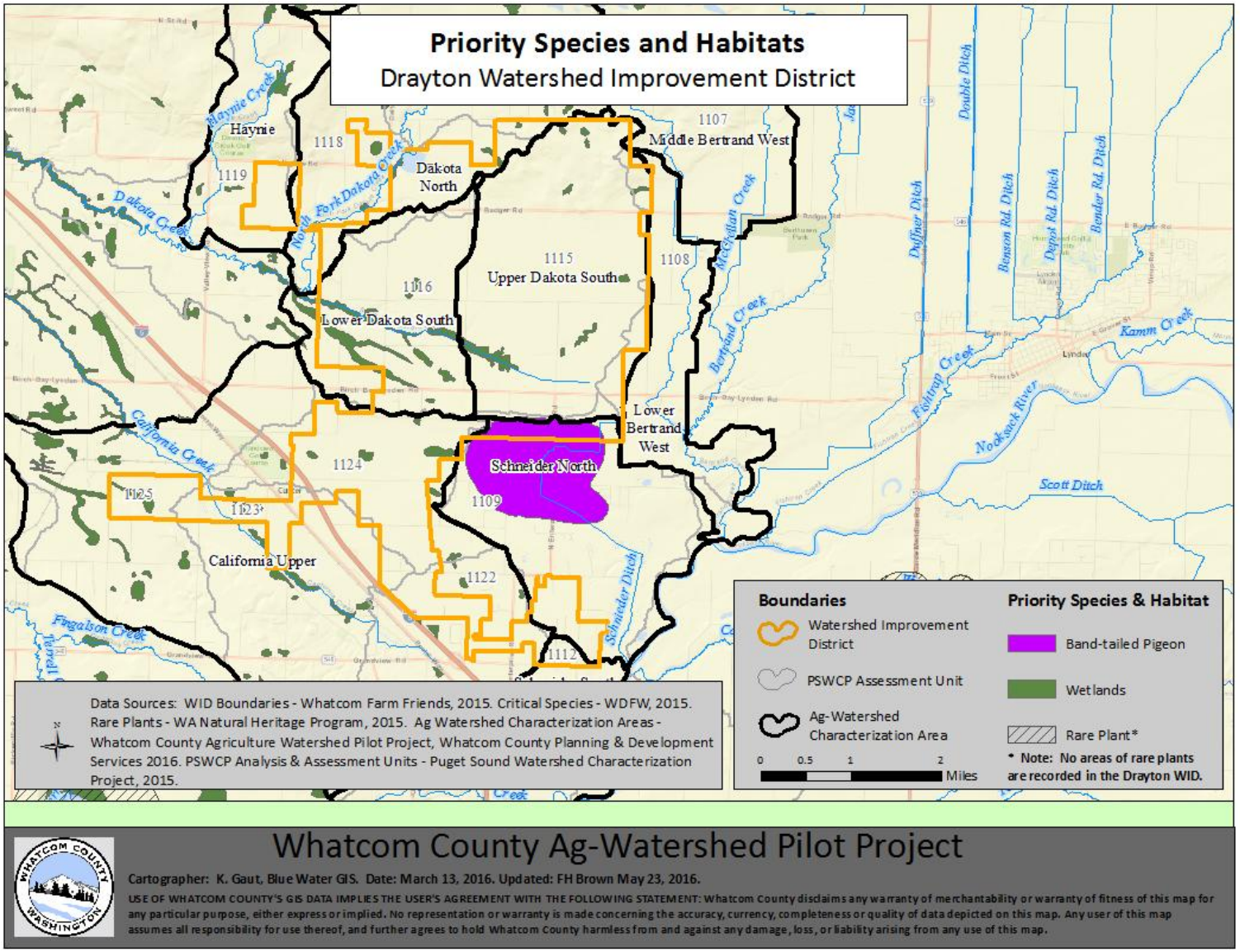


Figure 24. Drayton WID Reference map: Priority species and habitat

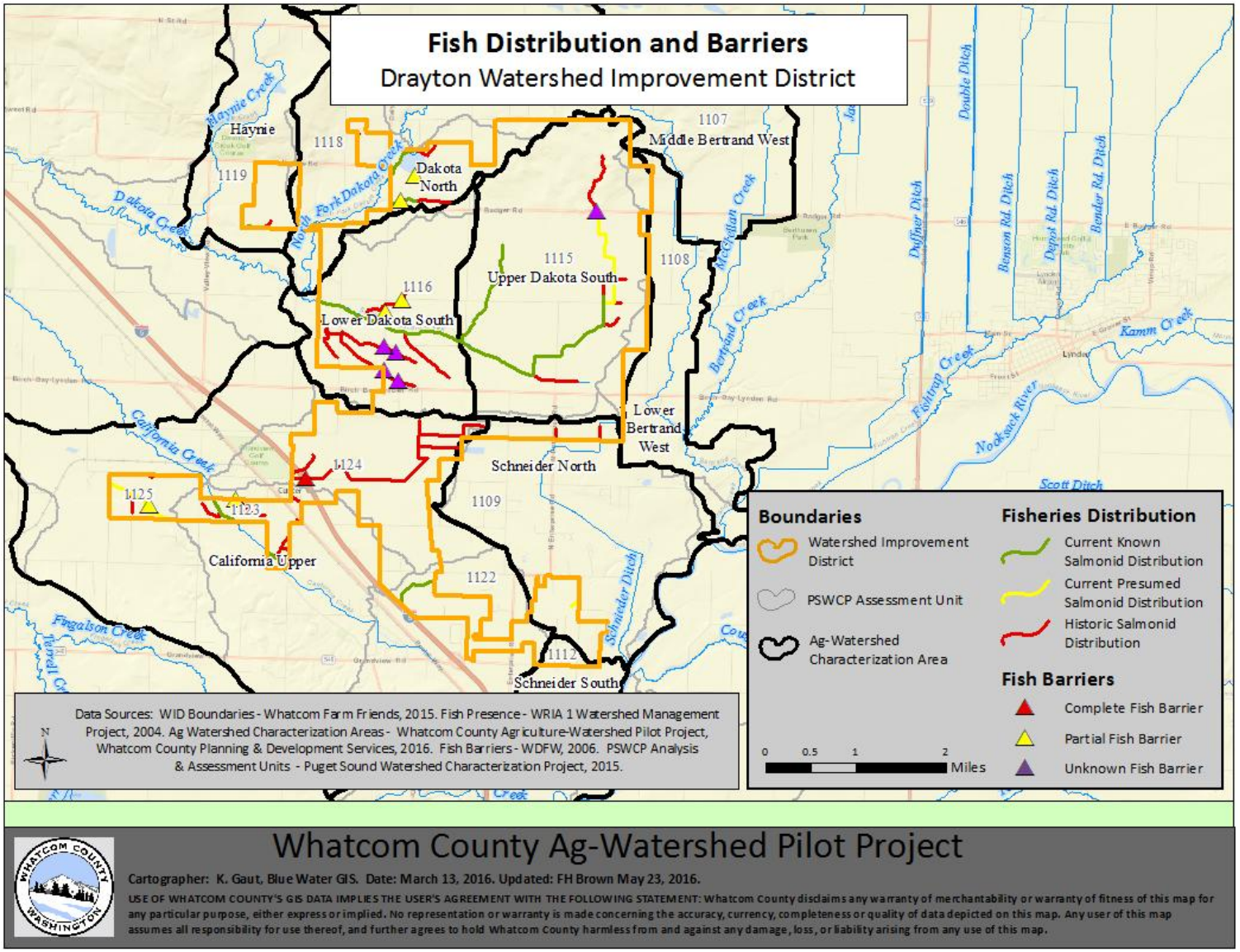


Figure 25. Drayton WID Reference map: Fish distribution and fish barriers

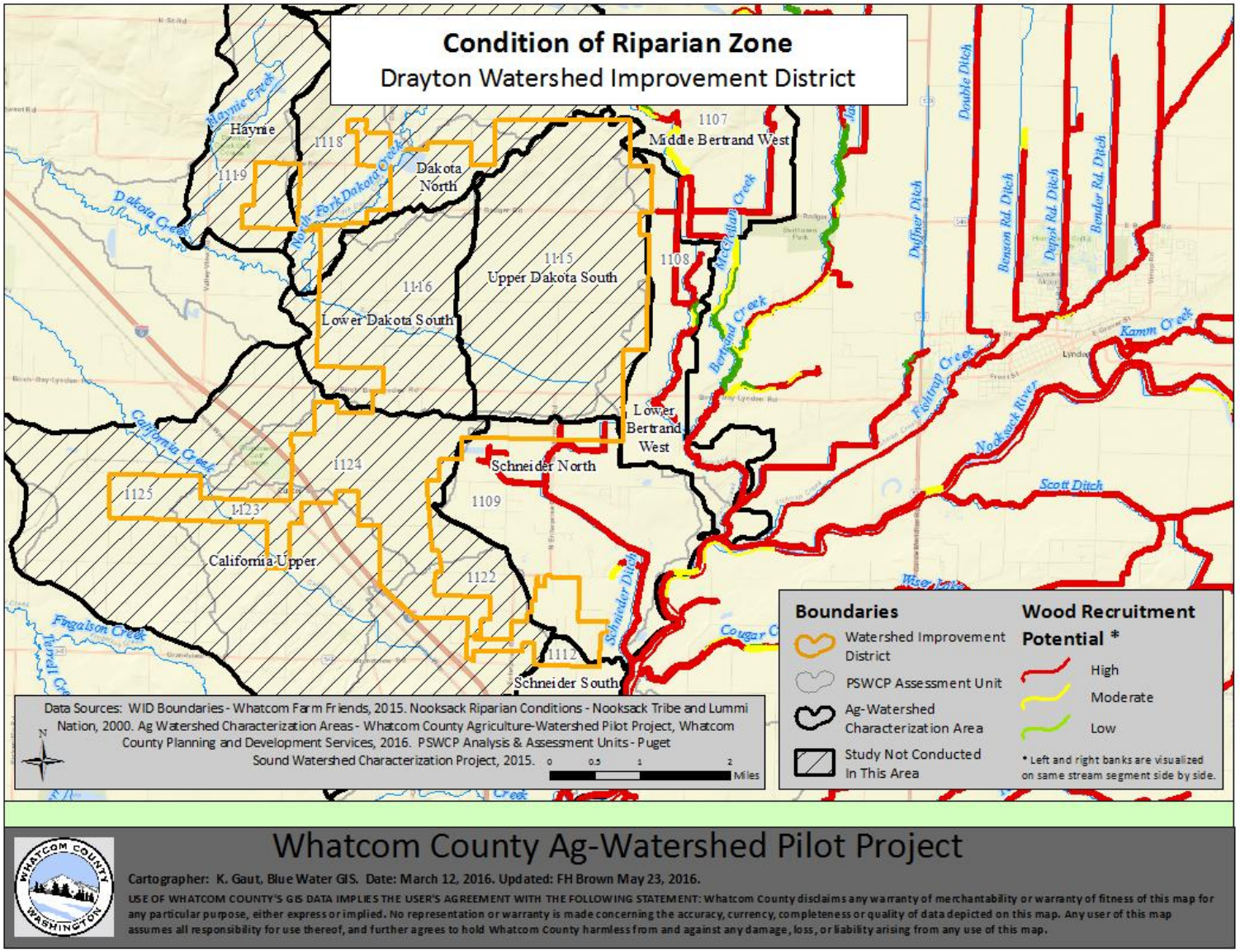


Figure 26. Drayton WID Reference map: Condition of riparian zone

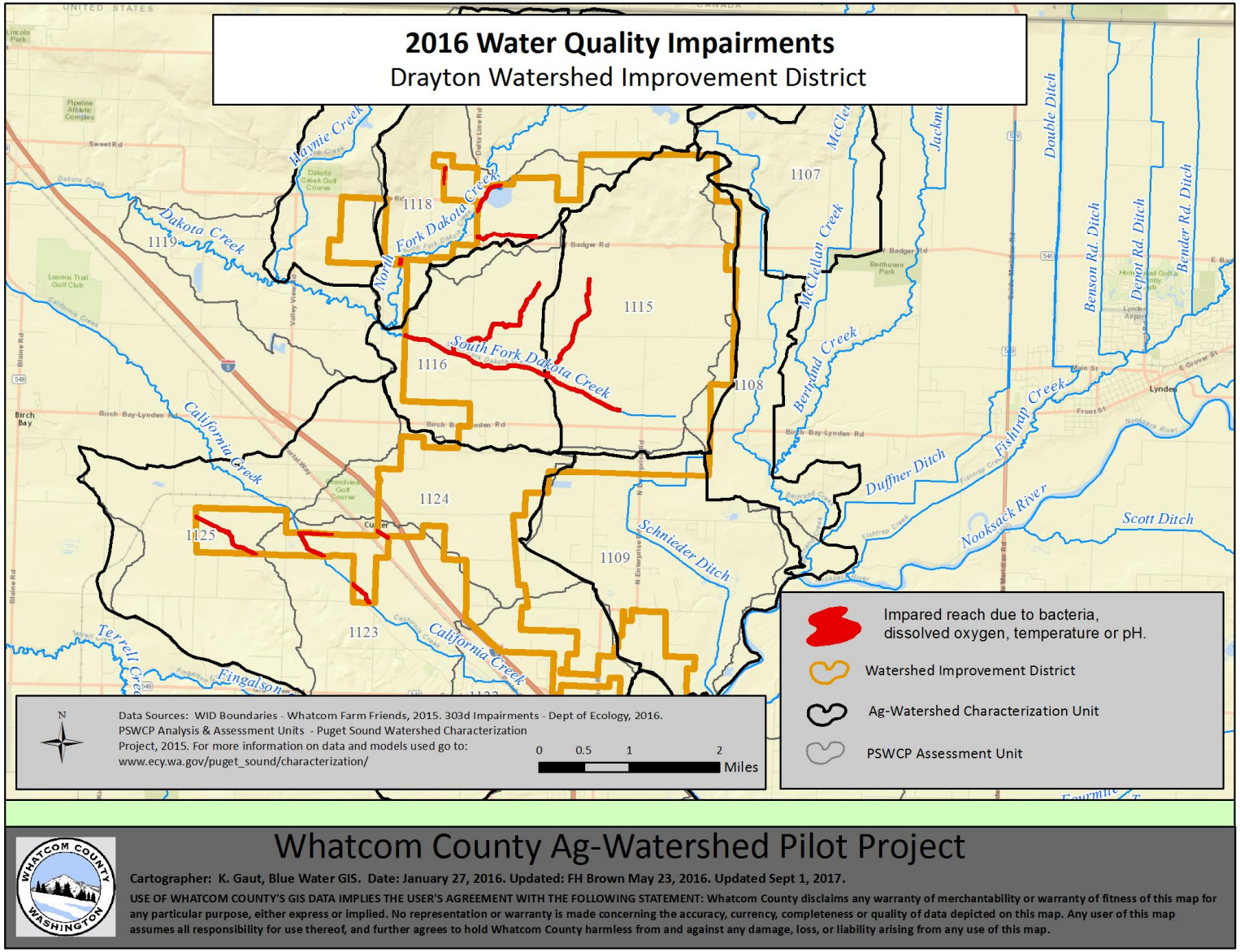
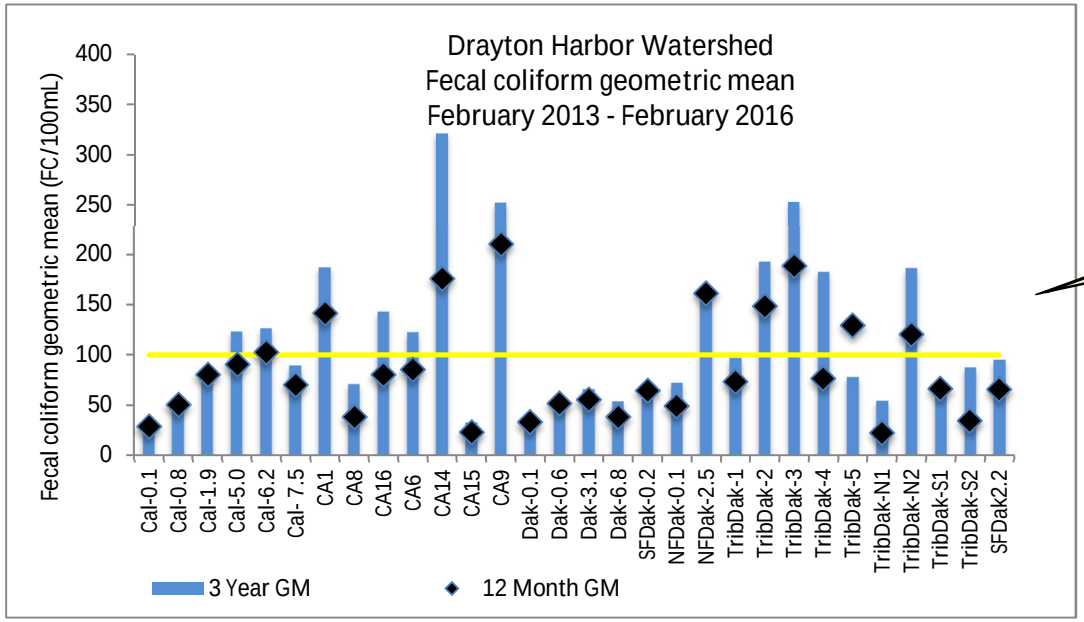
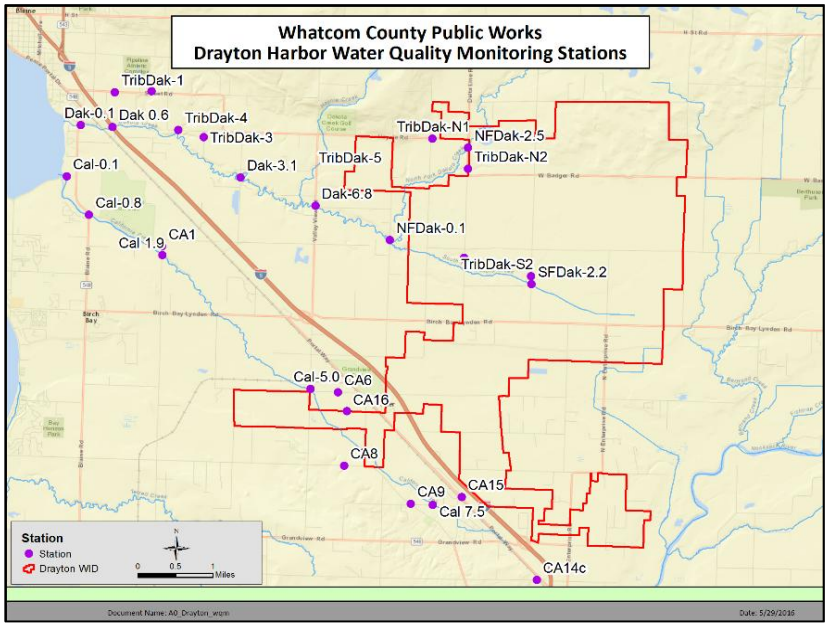
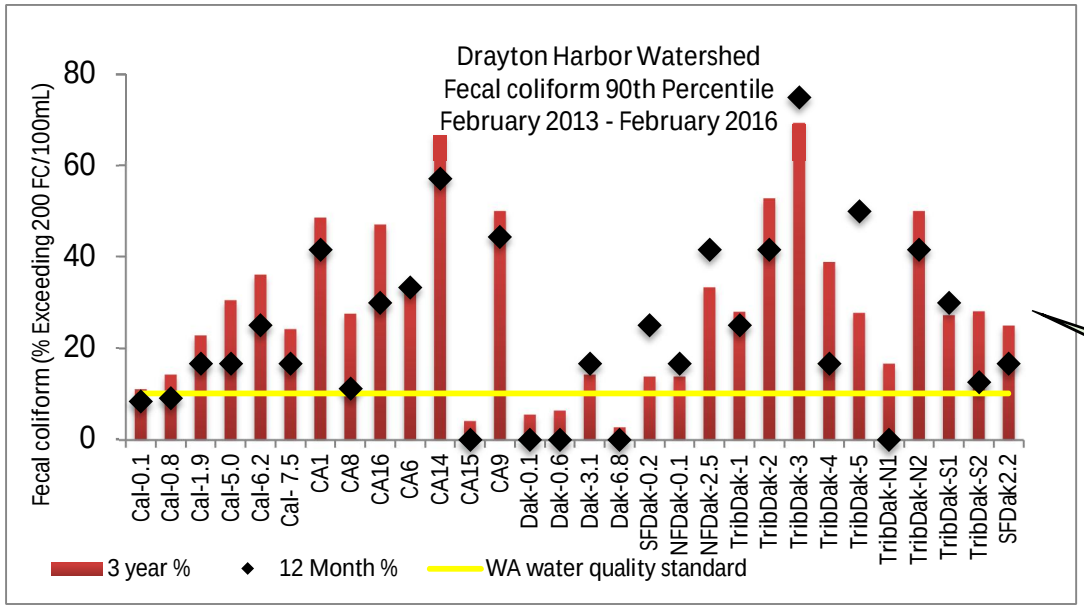


Figure 27. Water quality impairments in the Drayton WID (2016)



This graph illustrates fecal coliform geometric means at routine stations. A black dot located above the blue bar indicates that bacteria levels have been increasing in the past twelve months at that site. Data from Whatcom County Public Works.





This graph illustrates the percent of samples exceeding 200 FC/100mL at routine monitoring stations. A black dot above the red bar indicates that bacteria levels have been increasing in the past twelve months at that site. Data from Whatcom County Public Works.

Figure 28. Drayton WID Reference map: Routine water quality monitoring results. Data from Whatcom County Public Works

Appendix D: Relevant goals and policy statements for the WRIA 1 Watershed Management Project and the Whatcom County Comprehensive Plan (2016), compared to suggested priorities for the Drayton WID

Priority	WRIA1 watershed management project	Whatcom County Comprehensive Plan (Aug 2016)
	WRIA1 Watershed Management Project (2008). *Goals of the WMP.* http://wria1project.whatcomcounty.org/About-The-Project/Goals-Of-WMP/17.aspx	Whatcom County Comprehensive Plan, adopted August 2016. http://wa-whatcomcounty.civicplus.com/DocumentCenter/View/21056[1]
Water quantity - water availability (hydrology)	To assess water supply and use, and develop strategies to meet current and future needs. The strategies should retain or provide adequate amounts of water to protect and restore fish habitat, provide water for future out-of-stream uses, and ensure that adequate water supplies are available for agriculture, energy production, and population and economic growth under the requirements of the state's Growth Management Act.	Chapter 2 Land Use, Goal 2A Chapter 8 Resource Lands, Goal 8A, 8F Chapter 10, Goal 10D, 10F, 10G, 10I
Water quantity - access to water (rights/legal access)	To assess water supply and use, and develop strategies to meet current and future needs. The strategies should retain or provide adequate amounts of water to protect and restore fish habitat, provide water for future out-of-stream uses, and ensure that adequate water supplies are available for agriculture, energy production, and population and economic growth under the requirements of the state's Growth Management Act.	Chapter 2, Land Use Goal 2A Chapter 7 Economics, Goal 7K Chapter 8 Resource Lands, Goal 8F (also viable ag)
Water quality	To ensure that the quality of our water is sufficient for current and future uses, including restoring and protecting water quality to meet the needs of salmon and shellfish, contact recreational uses, cultural uses, protection of wildlife, providing affordable, safe domestic water supplies, and other beneficial uses. The initial objectives of the water quality management strategy will be to meet the water quality standards.	Chapter 8 Resource Lands, Goal 8A, 8EChapter 10 Environment, Goal 10F, 10H, 10G,10I, 10K, 10L

Priority	WRIA1 watershed management project	Whatcom County Comprehensive Plan (Aug 2016)
Drainage - subsurface field drainage	n/a	Chapter 8 Resource Lands, Goal 8D, 8E Chapter 10 Envrironment, Goal 10H
Drainage - floodwater	n/a	Chapter 10 Environment, Goal 10H
Education & communication	n/a	Chapter 2 Land Use, Goal 2M Chapter 10 Environment, Goal 10B
Representation (This priority is pulled from the minutes not the stated priorities on the website and representation overlaps with Water Rights).	n/a	Chapter 8 Resource Lands, Goal 8A Chapter 10 Environment, Goal 10L
Media/community relations (this priority is pulled from the minutes not the stated priorities on the website)	n/a	n/a
Habitat	To protect or enhance fish habitat in the management area and to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve habitats on which fish rely.	Chapter 2 Land Use, goal 2A, 2MChapter 7 Economics, goal 7HChapter 8 Resource lands, goal 8B (habitat and reg.s), 8D, 8EChapter 10 Environment, goal 10A, 10B 10C (reg.s), 10F, 10H, 10K, 10L, 10M (wetland)
Water flow processes	n/a	Chapter 10 Environment, Goal 10H, 10G
Land	n/a	Chapter 2 Land Use, Goal 2A Chapter 7 Economics, Goal 7H (also viable ag) Chapter 8 Resource Lands, Goal 8A (also viable ag),

Appendix E: Sources of available data for Drayton WID (July 2016).

Reproduced from the Drayton WID mapping report.

Source for this material:
Whatcom County Agriculture-Watershed Pilot Project (2016). *Agriculture-Watershed Characterization and Mapping Report for the Drayton Watershed Improvement District*. Whatcom County Planning & Development Services. http://www.Draytonwid.com/ [Alternative download <here>]

Sources of Available Data for Drayton WID
Updated September 2017

Prepared by Cheryl Lovato Niles & Heather MacKay

Purpose of this document

The purpose of this document is to collate relevant sources of data, particularly sources for data sets generated through longer-term routine monitoring programs. These data sets are potentially useful for field and desk work in the Drayton Watershed Improvement District (WID).

Sources for the following data types have been collated for the Haynie, Dakota, and California Creek watersheds:

- Water quality measures (fecal coliform, temperature, dissolved oxygen, turbidity, nitrogen, and phosphorous) from 2000 to the present,
- Hydrography,
- Stream flow from 2000 to the present,
- Erosion and avulsion hazard in the Nooksack River channel migration zone,
- Watershed level assessments of flow, storage, water quality, and habitat,
- Ground water measurements from 2000 to the present,
- Water rights, and agricultural water use,
- Present and future needs of public water systems,
- Fish presence and habitat evaluations from 1990 to the present,
- Salmon and steelhead population boundaries,
- Aquatic nuisance species,
- Instream and streambank vegetation from 1990 to the present,
- Land use and land cover from 2000 to the present,
- Historical conditions,
- Wildlife, and
- Soils.

Table of Contents

Table 1: Fecal coliform monitoring maps and reports

Watershed/Area	Parameter	Source	Description	URL
Haynie, Dakota North, Dakota South, California Upper	Fecal coliform	Whatcom County	Map of routine monitoring sites and reports of sampling results updated monthly	http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results (see note below for information on how to download FC data)
Haynie, Dakota North, Dakota South, California Upper	Fecal coliform	Conservation District	Watershed Health Assessment (November 2015)	http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results
Whatcom County (Department of Agriculture tests numerous stations routinely and also in response to high FC counts – station locations vary)	Fecal coliform	Washington State Departments of Agriculture and Ecology (only WSDA results shown as of 2/9/16). Data is available upon request from WSDA Dairy Nutrient Management group - Michael Isensee 360-961-7412	Map of preliminary source tracking results	http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results

Accessing water quality data from routine monitoring sites: Figure 1 shows the locations of routine water quality monitoring sites that are within the Drayton Watershed Improvement District.

To see the most recent couple of months of data from the map of routine water quality monitoring by Whatcom County, Nooksack Tribe and Washington State Department of Ecology available online at the County's website http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results, open the map at <http://wacds.maps.arcgis.com/apps/webappviewer/index.html?id=71fa677503c949c8847066178a531099>, and click on the layers symbol in the upper right hand corner. This opens a box titled Layer List. Select the box to the left of "Preliminary WQ Data Results (All)", and then click on the arrow to the right to open up the drop down menu. Select "Open Attribute Table". A detailed table will open up. Under "Options" in the upper left corner of the table, you can choose to export the data and it will automatically populate an Excel spreadsheet. The purple dots indicate station locations; the blue squares indicate that there is data associated with that station in this system. To find earlier data see Table 2 below.

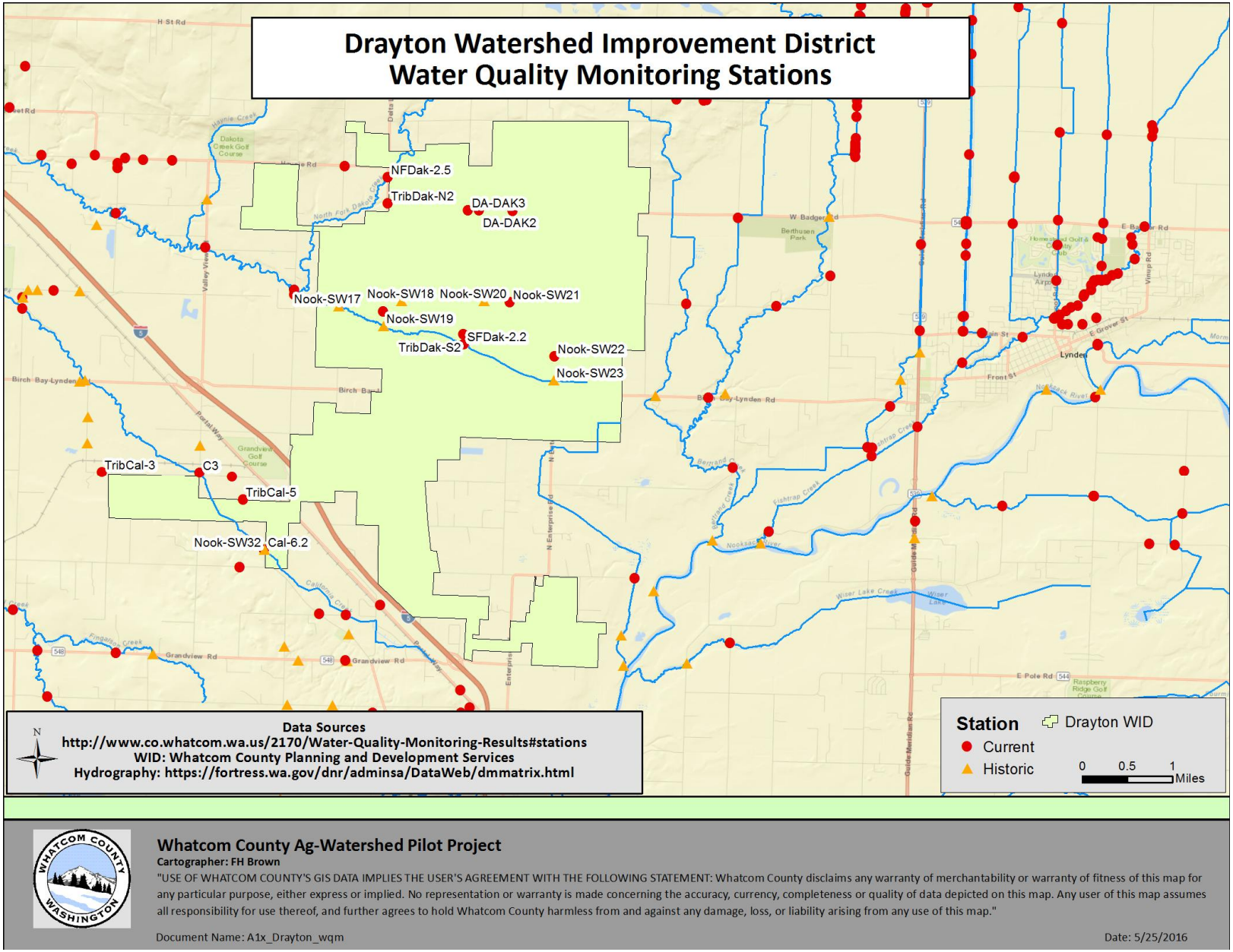


Figure 1: Drayton WID: Routine water quality monitoring stations. See Tables 1 and 2 for more information

Table 2: Where to find earlier water quality data from monitoring stations on Whatcom County Water Quality Monitoring Results for Drayton WID area. Data for the County Health Department is not included here because their monitoring focuses entirely on marine water. Earlier Washington Department of Agriculture data is available by request. See table 1 for contact information.

Historic data available from	Department of Ecology	Whatcom County Public Works	Nooksack Tribe
What	Data generally includes FC, pH, T, Conductivity, and DO. Occasionally flow and wetted width are recorded.	Focused on fecal coliform	Fecal coliform, E.coli, T, pH, DO, Conductivity, Turbidity,
How	Can be accessed via Environmental Information Management System (EIM) map or database. If accessing via the map, you can draw a polygon around the area of interest and request the data via email. Download requests of 50,000 records or less are processed immediately, a link to the file is sent to your email address. The contents can be saved to an excel file. If accessing via the database, you can search for data using specific station names, or by location name, WRIA, and County	Annual reports for 2011 through 2013 are available online at url below.	Available by request
Details	Map:<https://fortress.wa.gov/ecy/eimreporting/Map/Map.aspx?MapType=EIM> Database: <https://fortress.wa.gov/ecy/eimreporting/>	<http://www.co.whatcom.wa.us/2172/Resource-Library>	Jezra Belieau, Water Resources Specialist Nooksack Indian Tribe jbeaulieu@nooksack-nsn.gov
Station Names	1-CAL-0.1 1-CAL-0.8 1-CAL-3.1 1-CAL-5.0 1-CAL-6.2 1-CAL-SD1 1-DAK-0.1 1-DAK-3.1 1-DAK-4.9 1-DRAYSHORE-37 1-NF-DAK-0.1 1-NF-DAK-2.5 1-SF-DAK-0.2 1-SFDAK-2.2 1-TRIBCAL-0	Cal-0.1 Cal-0.8 Cal-1.9 Cal-5.0 Cal-6.2 Cal-7.5 Dak0.1 Dak0.6 Dak 3.1 Dak 6.8 NFDak-0.1 NFDak2.5 SFDak0.2 SFDak2.2	SW17 SW18 SW19 SW20 SW21 SW22 SW23 SW24 SW25 SW26 SW27 SW28 SW29 SW30 SW31 SW32 SW37

Historic data available from	Department of Ecology	Whatcom County Public Works	Nooksack Tribe
	1-TRIBCAL-1 1-TRIBCAL-2 1-TRIBCAL-3 1-TRIBCAL-4 1-TRIBCAL-5 1-TRIBDAK-3 1-TRIBDAK-4 1-TRIBDAK-5 1-TRIBDAK-N1 1-TRIBDAK-N2 1-TRIBDAK-S1 1-TRIBDRAY-1 NWIC-C1* NWIC-C3* NWIC-D1* NWIC-DG* RSM06600-001776 WAM06600-001776 – California Creek	 TribDak1 TribDak2 TribDak3 TribDak4 TribDak5 TribDakN1 TribDakN2 TribDakS1 TribDakS2 CA1 CA8 CA16 CA6 CA14 CA15 CA9	SW38 SW39 SW40 SW41 SW42 SW43 SW44 SW45 SW46

Table 3: Washington State list of water bodies impaired by pollution

WID/Area	Parameter	Source	URL
All	Water quality Assessment and 303(d) list	WA Department of Ecology	http://www.ecy.wa.gov/programs/wq/303d/

Table 4: Streamflow

Watershed	Ongoing/ Completed	Station ID	Description	Lat	Long	Collected by	Source	URL
California Upper	Ongoing	12213500	California Creek near Custer	485515	1223935	USGS	USGS "Summary Information for Continuous Streamflow Gages in and near the WRIA 1 Study Area"	http://wa.water.usgs.gov/projects/wria01/sw.htm [last accessed October 1, 2015]
Haynie	Ongoing	12214000	Dakota Creek near Blaine	485725	1223930	USGS	same	same

Table 5: Hydrography

Area	Parameter	Source	URL
US	Hydrography	USGS. The National Map, Hydrography	http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd [last accessed September 30, 2015]

Table 6: Additional streamflow reports

Ag-watershed characterization area	Watershed	Title	Published	URL
None available				

Table 7: Stream flow plus additional measures

Ag-watershed characterization area	Watershed	Additional parameters	Station ID	Station location	Ongoing/ Completed	Collected by	Source	URL	notes
Drayton	California Upper	T, Pressure, Cond., pH, DO,	17110002	California Creek near Pleasant Valley	ongoing	USGS	River & Stream Water Quality Monitoring	https://fortress.wa.gov/ecy/eap/riverwg/regions/state.asp [last accessed January 20, 2016]	Name doesn't match location on the USGS map, I think it should read "near Valley View"

Table 8: Erosion and avulsion in Nooksack River channel migration zone

Area	Parameter	Document Title	Author	Date	URL
Sumas, S. Lynden, N. Lynden, Bertrand, Laurel	Erosion and Avulsion	Erosion and Avulsion Hazard Mapping and Methodologies for use in the Nooksack River Channel Migration Zone Mapping	Paul Pittman, LEG Whatcom County Public Works and Peter Gill, Whatcom County Planning and Development Services,	2009	http://wa-whatcomcounty.civicplus.com/DocumentCenter/View/15492 [last accessed February 29, 2016]

Table 9: Groundwater data

Area	Parameter	Title of Table/Source	Station ID	Source	URL	Notes
all	Well location, use, depth, installation date, open interval	Summary Information for Wells in the WRIA 1 Study Area	1297 wells listed. Latitude and Longitude provided for all.	USGS	http://wa.water.usgs.gov/projects/wria01/data/well_info.htm via http://wa.water.usgs.gov/projects/wria01/gw.htm [both last accessed October 1, 2015]	This table contains data for all wells in the WRIA 1 study area that were in the USGS database as of December 14, 1999. There are many wells in the WRIA 1 study area that are not in the database. Additional information regarding wells in this table can be obtained by contacting Luis Fuste, the Information Officer of the USGS Washington Water Science Center of the USGS, at (253) 428-3600 x2653. Information in this table may overlap with information in the database of the Whatcom County Health and Human Services Department See Summary Information for Whatcom County Health and Human Services Department Wells in the WRIA 1 Study Area).
all	Well location, use, depth, installation date, open interval	Summary Information for Wells in the WRIA 1 Study Area, Downloaded from the Whatcom County Health and Human Services Department Database	Numerous wells listed. Township, range, section, and quarter section listed for all.	Whatcom County Health and Human Services	http://wa.water.usgs.gov/projects/wria01/data/tableGW2.htm [last accessed October 1, 2015]	This table contains selected data for all wells in the WRIA 1 study area that were in the Whatcom County Health and Human Services Department database as of January 7, 2000. There are many wells in the WRIA 1 study area that are not in the database. Additional information regarding wells in this table can be obtained by contacting Anne Marie Karlberg at the Whatcom County Health and Human Services Department, at (360) 738-2504 x50819. Information in this table may overlap with information in the database of the USGS (see Summary Information for Wells in the WRIA 1 Area, Downloaded from the USGS National Water Information System). Disclaimer: The locations of these wells have not been field checked. Construction information was gathered from driller's logs and may contain errors.

Area	Parameter	Title of Table/Source	Station ID	Source	URL	Notes
all	Well location, use, depth, installation date, open interval	Wells with Sufficient Information to Compute Hydraulic Conductivities, Downloaded from the USGS National Water Information System (NWIS)	Numerous wells listed. Lat. and long. listed for all.	USGS	http://wa.water.usgs.gov/projects/wria01/data/tableGW4.htm [last accessed October 1, 2015]	All information in this table is provisional and subject to revision. The data in the database were collected and entered for a wide variety of projects and purposes over a long period of time and the resulting dataset varies in quality and detail. Although many wells have accurate information (especially those checked and used in recent studies), some problems are known to exist for older entries. Examples of known problems include, but are not limited to, inaccurate well locations, old information regarding the primary use of the well, incorrect installation dates, and erroneous labeling of well locations as having been field-checked. No checks were performed to assure consistency between the latitude and longitude of a well and its assigned local name
all	Water level below surface, date of measurement, method	Historical Ground-Water Levels in the WRIA 1 Study Area	Numerous wells listed. USGS ID is lat long.	USGS	http://wa.water.usgs.gov/projects/wria01/data/water_levels.htm [last accessed October 1, 2015]	Table contains historical water-level information for wells in the WRIA 1 study area that were in the USGS National Water Information System (NWIS) on December 14, 1999, and for which water-level information was available. Additional information regarding wells in this table can be obtained by contacting Luis Fuste, the Information Officer of the USGS Washington Water Science Center of the USGS, at (253) 428-3600 x2653.

Table 10: Additional Reports on Groundwater

Watershed/ Area	Title	Published	Authors	URL
all	Nitrate Contamination in the Sumas-Blaine Aquifer, Whatcom County, Washington	Publication No. 11-03-027, May 2011	Melanie Redding L. Hg., Barbara Carey L. Hg., and Kirk Sinclair L. Hg., Washington State Department of Ecology	https://fortress.wa.gov/ecy/publications/documents/1103027.pdf
all	Sumas-Blaine Aquifer Nitrate Contamination Summary	Department of Ecology Pub. No. 12-03-026, June 2012	Carey, B., and L. Hg.	www.ecy.wa.gov/biblio/1203026.html
all	Hydrogeology, ground water quality, and sources of nitrate in lowland glacial aquifers of Whatcom County, Washington, and British Columbia, Canada	US Geological Survey Water-Resources Investigations Report 98-4195. 1999. 251 pages, 5 plates.	Cox, S. E., and S. C. Kahle	http://pubs.usgs.gov/wri/1998/4195/report.pdf
WRIA1	WRIA 1 Groundwater Data Assessment: Overview. In Bandaragoda, C., C. Lindsay, J. Greenberg, and M. Dumas, editors. WRIA 1 Groundwater Data Assessment	Whatcom County PUD #1, Whatcom County, WA. WRIA 1 Joint Board, 2013.	Lindsay, C. and C. Bandaragoda,	http://wria1project.whatcomcounty.org/

Table 11: Groundwater maps

Watershed/ Area	Parameter	Title	Last modified	Source	URL	Notes
all	Ground-water movement	Generalized Pattern of Ground -Water Movement for the Puget Sound Aquifer System in the WRIA 1 Study Area	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW2.pdf [last accessed October 1, 2015]	Modified from Vaccaro, J.J., Hasen, A.J. and Jones, M.A., 1998. Hydrogeologic Framework of the Puget Sound Aquifer System, Washington and British Columbia; US Geological Survey Professional Paper 1424-D.
all	Selected well locations	Locations of Selected Wells in the WRIA 1 Study Area by Primary Water Use	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW4.pdf [last accessed October 1, 2015]	USGS National Water Information System (NWIS), downloaded December 14, 1999. Not all well locations have been verified and therefore they may plot in the wrong locations.
all	Ground-water levels	Water-Level Contours in the Uppermost Aquifer of the Lynden-Everson-Nooksack-Sumas (LENS) Study Area	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW3.pdf [last accessed October 1, 2015]	From: Cox, S.E., and Kahle, S.C., 1999, Hydrogeology, Ground-Water Quality, and Sources of Nitrate in Lowland Glacial Aquifers of Whatcom County, Washington, and British Columbia, Canada: U.S. Geological Survey Water-Resources Investigations Report98-4195, 5 plates, 251 p.
all	Aquifer tests	Approximate Locations of Aquifer Tests in the WRIA 1 Study Area	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW5.pdf [last accessed October 1, 2015]	From: Various Hydrogeologic Studies in the WRIA 1 Study Area
all	Selected well locations	Locations of Selected Wells in the WRIA 1 Study Area with Sufficient Information to Compute Hydraulic Conductivities	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW6.pdf [last accessed October 1, 2015]	From: USGS National Water Information System (NWIS), downloaded December 14, 1999. Not all well locations have been verified, therefore they may plot in the wrong locations.
All	Selected well locations	Locations of Selected Wells in the WRIA 1 Study Area with Five or More Historical Water Levels	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW7.pdf [last accessed October 1, 2015]	From: USGS National Water Information System (NWIS), downloaded December 14, 1999. Not all well locations have been verified and therefore they may plot in the wrong locations

all	Soil types	Distribution of Soil Map Units in the WRIA 1 Study Area	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW8.pdf [last accessed October 1, 2015]	From: U.S. Department of Agriculture, 1994, State Soil Geographic (STATSGO) Data Base: Date use information, Soil Conservation Service, National Cartography and GIS Center, Fort Worth, Texas, accessed January 28, 2000, at URL http://www.ftw.nrcs.usda.gov/stat_data.html. Note: The soil information for this map was Natural Resources Conservation Service 1994 STATSGO data. STATSGO was compiled at 1:250,000 and designed to be used primarily for regional, multi-state, state, and river-basin resource planning, management, and monitoring.
all	Soil permeability	Soil Permeability in Parts of the WRIA 1 Study Area	2000	USGS	http://wa.water.usgs.gov/projects/wria01/maps/mapGW9.pdf [last accessed October 1, 2015]	Modified from: U.S. Department of Agriculture-Soil Conservation Service, 1992, Soil Survey of Whatcom County Area, Washington, 54 sheets, 481 p.

Table 12: Water rights

Watershed/ Area	Parameter	Title	Source	URL	Notes
all	Quantity, place of use, source, purpose, all documents associated with water rights, and well logs	Water Resources Explorer	Washington State Department of Ecology	http://www.ecy.wa.gov/programs/wr/info/webmap.html [last accessed October 1, 2015]	You can search with an interactive map, or using information such as address, township and range, or latitude and longitude.
all	Water rights	WRIA 1 Water Rights Atlas, 2003	Public Utility District No. 1	http://wria1project.whatcomcounty.org/Resource-Library/Studies-And-Reports/Water-Rights/65.aspx	

Table 13: Present and future needs of public water systems

Area	Parameter	Title	Source	URL
All	Present and future needs for public water systems	Whatcom County Coordinated Water System Plan, 2016	Whatcom County Public Works	http://www.whatcomcounty.us/DocumentCenter/View/24143 [last accessed August 28, 2017]

Table 14: Agricultural irrigation water use and water rights

Area	Parameter	Title	Source	URL
All	Agricultural irrigation water	Quantification of Agricultural Irrigation Water Use and Water Rights, December 2016.	Public Utility District no. 1 of Whatcom County	http://wria1project.whatcomcounty.org/

Table 15: Watershed level assessment of water flow and storage, water quality, and habitat

Area	Parameter	Title	Source	URL
All	Watershed characterization: water flow (delivery and storage), water quality, and habitat assessments	Puget Sound Watershed Characterization Project	Washington State Department of Ecology	http://www.ecy.wa.gov/puget_sound/characterization/index.html

Table 16: Land Use/Land Cover

Watershed/ Area	Parameter	Document	URL
Whatcom County	Agricultural Land Cover Analysis	Whatcom County Agricultural Land Cover Analysis version 2.3. 2013. Whatcom County Planning and Development Services	http://www.whatcomcounty.us/documentcenter/view/3989
Whatcom County	Critical Areas Ordinance Maps	Whatcom County's Critical Areas (CAO) are environmentally sensitive natural resources that have been designated for protection and management in accordance with the requirements of the Growth Management Act.	http://www.whatcomcounty.us/811/County-Wide-Critical-Area-Ordinance-Maps [last accessed October 1, 2015]
Whatcom County	Land Cover Change	WDFW High Resolution Change Detection Project; Whatcom County: Land Cover Change by Sub-Basin	http://wa-whatcomcounty.civicplus.com/DocumentCenter/View/15805 [last accessed February 26, 2016]

Table 17: WDFW Spawner Surveys

Watersheds	Parameter	Site	Station location	Frequency	Date	Collected by	Source
California Creek and Dakota Creek	Limited field data from a one year survey to assess adult Steelhead spawning habitat: Steelhead redds or suitable gravel for Steelhead spawning.	Specifics are available upon request	Specifics are available upon request	One-time	2009	WDFW	WDFW Tasha Geiger Nooksack River Stock Assessment 360-305-2023 Natasha.geiger@dfw.wa.gov

Table 18: Aquatic Nuisance Species

Watersheds/Area	Title - Parameter	Notes	Frequency	Date		Source
Washington State	Aquatic invasive species	Description of aquatic nuisance species with distribution maps. Organized by organism.	ongoing		http://wdfw.wa.gov/ais [last accessed October 1, 2015]	WDFW
Washington State	Washington Herp Atlas		unknown	Maps updated 2013	http://www1.dnr.wa.gov/nhp/refdesk/herp/herpmain.html [last accessed October 1, 2015]	DNR
Washington State	Washington Nature Mapping Program – wildlife distribution maps		unknown	unknown	http://naturemappingfoundation.org/natmap/maps/ [last accessed October 1, 2015]	NatureMapping Program
US	USGS NAS – Nonindigenous Aquatic Species – presence and distribution	Searchable database/maps of nonindigenous aquatic species sightings organized by group, i.e. amphibians, fish, mammals.	unknown	Date of info varies	http://nas.er.usgs.gov/queries/default.aspx [last accessed October 1, 2015]	USGS
Washington State	Washington Department of Ecology Environmental Assessment Aquatic Plant Monitoring	Description of aquatic nuisance plants with distribution maps, searchable survey results by county, lake, or plant name, and downloadable survey data.	ongoing	Date of info varies	http://www.ecy.wa.gov/programs/wq/plants/weeds/index.html [last accessed October 1, 2015]	WA Department of Ecology

Watersheds/Area	Title - Parameter	Notes	Frequency	Date		Source
Whatcom County	Whatcom County Noxious Weeds webpages	Distribution map of some noxious weeds. Field guides and information about noxious weeds.	unknown	Map date is 2008. Website date is 2007. Other material is undated.	http://www.whatcomcounty.us/DocumentCenter/View/2506 [last accessed October 1, 2015]	Whatcom County
Pacific Northwest	Aquatic and Riparian Effectiveness Monitoring Program Invasive Species Report	Description of monitoring program and presence of invasive species in surveyed areas.	2010	2011	http://www.reo.gov/monitoring/reports/watershed/AREMP%20Aquatic%20Invasive%20Species%20Report%202010.pdf [last accessed October 1, 2015]	UW Forest Service and Bureau of Land Management

Table 19: Additional Habitat/Wildlife Documents

Watershed/Area	Parameter	Document
Whatcom County	Fish barriers	Whatcom County Public Works, 2006. Whatcom County Fish Passage Barrier Inventory Final Report - IAC Project Number: 01-1258 N. January, 2006. <http://salmon.wria1.org/resources/documents> [last accessed January 4, 2016]
Includes Dakota and California Creeks	Riparian inventory and function assessment	Anchor QEA, LLC, 2010. Riparian Vegetation Inventory and Function Assessment of Tributaries and Marine Shoreline, Northwest Whatcom County. Whatcom County Water Resources. June, 2010. <http://salmon.wria1.org/resources/documents> [last accessed January 4, 2016]
WRIA 1	Fish habitat	Smith, C.J. 2002. Salmon and steelhead habitat limiting factors in WRIA 1, the Nooksack basin. Washington State Conservation Commission, Lacey, Washington. 325 pp.
Dakota North	2013 Data Integration of WRIA 1 Hydraulic, Fish Habitat, and Hydrology Models	Bandaragoda, C. Joanne Greenberg, and Mary Dumas (2013). Data integration of WRIA 1 Hydraulic, Fish Habitat, and Hydrology Models. 134 pp. Nooksack Indian Tribe, Whatcom County, WA. WRIA 1 Joint Board. Retrieved [Date], from http://wria1project.whatcomcounty.org/
WRIA 1	Fish presence	Anchor Environmental, LLC. 2003. Fish periodicity in WRIA 1. Prepared for City of Bellingham Public Works Department. Seattle, Washington. 43 pp+ Appendices
Whatcom County	Biodiversity	Nelson, R., 2007. Mapping Biodiversity in Whatcom County: Data and Methods. Submitted to the Whatcom Legacy Project, August 2007. <http://wa-whatcomcounty.civicplus.com/DocumentCenter/View/15493> [last accessed February 29, 2016}
Whatcom County	Wildlife	Eissinger, A., 1994. Significant Wildlife Areas. (Available through the public library)
Whatcom County	Fish and wildlife	Watts, S. 1994. Fish and Wildlife Habitat Atlas of Whatcom County. Whatcom County Planning & Development Services.
Township 40N R1E	Historical conditions	Cornelius, J.A, 1872. *Field notes east boundary and subdivisional lines township 40N R1 east by I.A. Cornelius, Dep. Sur. 1872.* General Land Office Cadastral Survey. https://www.blm.gov/or/landrecords/
Exterior lines of township 39N, R1E & 2E	Historical conditions	Smith, I.W. 1859. *Field notes of the exterior lines of townships no. 39 N ranges 2E & 1E, 40N R1W & north boundary of township 38N R1E & 39N R1W*. General Land Office Cadastral Survey. https://www.blm.gov/or/landrecords/survey/ [last accessed August 24, 2017]

Table 20: Additional Habitat/Wildlife Maps and Databases

Watershed/Area	Parameter	Document/Website	URL	Source
WRIA 1	Fish Presence Char, Chinook, Chum, Coho, Cutthroat, Kokanee, Pink, Steelhead	Maps: Fish Presence by species available on Whatcom Salmon Recovery website	http://whatcomsalmon.whatcomcounty.org/maps-fishpresence.html [last accessed October 1, 2015]	
Whatcom County	Wildlife	The Whatcom County mappings were completed in 2007, as part of a project to characterize ecosystem processes and wildlife habitat in the Birch Bay Watershed.	http://wdfw.wa.gov/conservation/habitat/planning/lha/whatcom.html	Washington Department of Ecology and Washington Department of Fish and Wildlife
Washington State	Priority Habitats and Species on the Web	PHS on the Web is a Washington Department of Fish and Wildlife web-based, interactive map for citizens, landowners, cities and counties, tribal governments, other agencies, developers, conservation groups, and interested parties to find basic information about the known location of Priority Habitats and Species (PHS) in Washington State.	http://wdfw.wa.gov/mapping/phs/ [last accessed October 1, 2015]	Washington Department of Fish and Wildlife
Washington State	Salmon distribution, status, and habitats	SalmonScape is an interactive mapping application designed to display and report a wide range of data related to salmon distribution, status, and habitats. The data sources used by SalmonScape include stream specific fish and habitat data, and information about stock status and recovery evaluations.	http://apps.wdfw.wa.gov/salmonscape/ [last accessed October 1, 2015]	Washington Department of Fish and Wildlife
West Coast	Salmon	Maps of salmon and steelhead population boundaries	http://www.westcoast.fisheries.noaa.gov/maps_data/maps_and_gis_data.html [last accessed October 1, 2015]	NOAA Fisheries, West Coast Region
Whatcom County	Marine species and Habitats	Whatcom County Marine Resources maps of marine species and habitats	http://www.mrc.whatcomcounty.org/library [last accessed October 1, 2015]	Whatcom County Marine Resources Committee Library

Watershed/Area	Parameter	Document/Website	URL	Source
US	Critical habitat maps for marine and anadromous fishes	Website links to data and maps. The critical habitat maps provided here are for illustrative purposes only. Textual descriptions of critical habitats, which are provided in the associated *Federal Register* notices (see links below), are the definitive sources for determining critical habitat boundaries. Map and *Federal Register* notice links are PDF files.	http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm [last accessed January 21, 2016]	NMFS NOAA
US	Threatened and Endangered Species	Environmental Conservation Online System, data and maps.	http://ecos.fws.gov/ecp/	US FWS
Washington State	Rare plants, animals, ecological communities	Reference Desk of the Washington Natural Heritage Program. Includes searchable databases	http://www1.dnr.wa.gov/nhp/refdesk/gis/index.html [last accessed October 1, 2015]	Washington State Department of Natural Resources
Puget Sound Region	Wetlands	National Wetlands Inventory, data and maps	http://www.fws.gov/wetlands/	US FWS

Table 21: Soils

Watershed	Parameter	Document	URL	Source
US	Soils	Web Soil Survey	http://websoilsurvey.nrcs.usda.gov/app/ [last accessed October 1, 2015]	USDA Natural Resource Conservation Service

Table 22: WRIA 1 Materials Online - *In addition to the WRIA 1 materials included in this memo, there are many additional resources available on the WRIA1 Resource Library webpages*

Watersheds	Type of Resource	Topics or Titles	URL
all	Studies	Water rights, Water Quantity, Water Quality, and Habitat and Instream Flow; The 2010 State of the Watershed Report, 2013 WRIA Groundwater Data Assessment, 2013 Data Integration of WRIA 1 Hydraulic, Fish Habitat and Hydrology Models, The Whatcom County Coordinated Water System Plan, 2000 (a 2016 version is available at http://www.whatcomcounty.us/1035/Coordinated-Water-System-Plan-Update), and 2005 Numerical Groundwater Flow Model of the Abbotsford-Sumas Aquifer	http://wria1project.whatcomcounty.org/Resource-Library/8.aspx>
all	Maps	WRIA 1 Watersheds Map V3 Historic Land Cover Map - USU Existing Land Cover Future Land Cover – USGS Impervious Surfaces – NOAA Population Density – WA DOE Approximate Depth to Water Combined Hydrology Mechanisms, Draft – 11 Precipitation – PRISM Surface Water Storage Alterations Water Right Watershed Status Long Term Monitoring Adopted Map, and Interactive WRIA Monitoring Stations.	http://wria1project.whatcomcounty.org/Resource-Library/Maps/38.aspx

Appendix F: Notes from the Whatcom Watershed Improvement Districts Work Session in Lynden, March 20, 2017.

Notes

Whatcom Watershed Improvement Districts Work Session

Steakhouse 9 - Lynden, WA
March 20, 2015 – 10:30 am to 3:00 pm

Facilitator – Ray Ledgerwood

Meeting Purpose:

- Identify strategic priorities in each WID, discuss coordination on certain priorities, and learn techniques for comprehensive plans.

Opening Comments

Come together to see what we have done, what we want to do as WIDs…individually and collectively.

Watershed Improvement District (WID) Reports of What Has Been Done since April 2015

WID	Report
Bertrand WID	· Raised assessment to have revenue for technical and legal assistance · Surface to ground water · New tide gate on Schell Creek · Active on Lummi negotiations · Streamflow augmentation project · Funding for ground water model · Guide Meridian ditch work · Water quality sampling · Worked with Heather on resource inventory · Culvert replacements
North Lynden WID	· Smallest WID · Water quality testing with county…PIC program…very intense · Farmers in area substantiated by monitoring indicating Canada issues · City of Lynden working on getting septic systems connected and/or addressed · Ditch maintenance on local ditches…difference in water quality sampling improvement · Contacts with neighbors regarding practices · Spray ditches annually for Reed Canary Grass
Laurel WID	· Have discussions on problem areas, identify areas with issues…go out and talk with land owners · Water quality reporting…challenge in bracketing…showing where the problems were noted · Workshop on horse management · Developing a 5 year plan · Developing relationships with other groups · Supporting the bigger water board · Working with 10 mile group

South Lynden WID	· Water quality testing…some things did not make sense · Worked on known problems · Worked on water banking concept, storage of water for later use, deep well possibilities, · Protecting water rights · Comprehensive plan development · Talking with fellow farmers regarding water quality · Drainage issues and river running through our area · Ditch spraying · Possibilities of improving drainage of the river · Supporting AWB
Sumas WID	· Thorough water testing…added sites · Interesting monitoring information · Share water quality data with farmers · Mapping project with help from Heather · Looking at the various areas to do work · Looking at a management plan for the WID with available funding · Outreach lunch in Sumas to take our work to the people in the WID…shared results of water testing · Tour scheduled cancelled because of snow…when Keith is available to see which potential projects are out there · Did drainage work with local drainage district · Looking at prioritizing projects · Met with RESources to work on quality monitoring - elephants in room
Drayton WID	· Work with Birch Bay Sewer and Water and other partner organizations and specialists · Deep water aquifer project and water resource data · Looking at water resource potential, water rights, supply issues · Water quality monitoring · Drayton Harbor shellfish beds opened up…credit due…goal · Conservation workshop · WIDS do more than just the projects we are talking about · AWB work (coordination) with the tribes · Work on legal and political issues…Whatcom Family Farmers…important that we formed WIDs when we did · Disappointed in another organization with a recent assertion that we have not done anything · Entering a most critical phase of negotiation with the tribes · Water conservation, water quality projects completed · Work with Whatcom Family Farmers regarding most serious issues, influence
Resource Specialists	· Got our pollution prevention program going in county · PUD and RH2 worked on water quality report · First 3 phase of ground water data collection · Whatcom Water Supply working group · PUD on drought contingency planning effort · Lummi infrastructure study

	· Integrate water supply efforts…merging boards…system wide improvement of levies · Comprehensive plan update · Purchase development rights program (issue) · Threshold on impervious surfaces (issue that could damage agriculture)…meeting this Thursday

Summary Whatcom WIDs Strategic Priorities (revised 3.20.17)

WID	Priority 1	Priority 2	Priority 3	Priority 4
Bertrand WID	Water Rights	Water Quality	Drainage	Flood Management
Drayton WID	Water Rights	Water Quality	Comprehensive Plan	
North Lynden WID	Drainage	Water Quality	Water Rights	Flood Management
Laurel WID	Water Rights	Drainage	Water Quality	Flood Management
South Lynden WID	Water Quality	Water Rights	Drainage	Flood Management
Sumas WID	Water Quality	Water Rights	Agricultural Protection	Communication, Outreach, Education

Top Activities for Upcoming Year

If we had time, money, energy for one, then that one and one more, those two…etc.

WID	Top Activities for Upcoming Year
Bertrand WID	1. Water augmentation project finished 2. Surface to groundwater transfers…support legislation and legal effort 3. Continue water quality testing to bring quality back 4. Update Comprehensive plan
Drayton WID	1. Continue to work on deep water aquifer…move beyond just the exploration…to supply or mitigation of new water rights 2. Continue to monitor water quality and find hot spots 3. Working with farmers on legal avenues to move water around…spreading, piping, water bank, transfers 4. Public relations…family farmers to dispute misinformation
North Lynden WID	1. 5 year permit for drainage maintenance…Find the funding for development of the 5 year plan…chase paperwork 2. Continue our water quality work with Whatcom County Public Works, and Lynden 3. Work on culvert repair/replacement
Laurel WID	1. Support the AWB for efforts in legal negotiation and lobbying 2. Develop a 5 year plan for drainage 3. Set up the DNA testing for water quality
South Lynden WID	1. Work with resources on DNA sequencing 2. Continue water quality testing 3. Work on water rights…obtain, distribute water rights…lobby to get it done

Sumas WID	1. Ditch cleaning project 2. Continued water quality testing 3. Outreach and education with our land owners

Strategies for Working Together

Strategy	Lead
Communication/Outreach	
· Preserving the "one voice" outreach...continue work with key partners...work together to defend agriculture and get the word out	· Whatcom Family Farmers – Fred, specific partners – eg public affairs people in organizations · Story specific for information · Brad & Rich
· Communication and community outreach...message in positive way	· See above
· Habitat for species...telling people what farmers are doing to benefit habitat	·
Legal	
· Continue to identify legal access to water supply...acquiring, getting water where it needs to go	· Bill, Marty, Henry, Chuck, Greg
· Work together on tribal negotiations on water quality and supply	· Negotiation Team, Fred, Greg · Needs expanded and probably a different team as supply is addressed
· Legal challenges, and holding them off	· Bill, Marty, Scott, Jeff, Greg, Henry
Quality	
· Work together on funding for and implementation of DNA testing	· David – N3, Landon, Kent,
· Water quality projects and how it effects our industry...improving and communicating xx	· Fred, · See above
Drainage	
· Get permits faster and eliminate some of the paper work – 5 year Programmatic Permits	· Karin, Frank, Joel, Henry, Fred
Supply/Access	
· Water quantity projects and ability to have water long term for future generations...mitigation banking	· Bill, Marty, Scott, Jeff, Greg, Henry
Organizational/Administrative	
· Tracking legislation, rule making, agendas, and impacts at County, State, Federal levels...agriculture representation on committees	· Henry, Bill, Fred, partner individuals
· Utilize the influence system of collective WIDs including messengers and skills development (training)	· Whatcom Family Farmers
· Organize the listing of committees and groups to get agriculture representation on	· Henry, Fred and members

Expert Resources

Chuck Lindsay, AESI - hydrogeology	· Hydrologist · 30 years' experience… · Identification, ground water supply · Water right evaluations · Working for County · Stream augmentation work · Surface to ground water transfer information · Development of deep water – Drayton · Water rights guidance manual for farmers
Jon Hutchings – WCPW Director	· Public works director · Drainage, culverts, roads · River and road program · Natural resources and water resources · Expectation and growing number of services that county provides…county council passed water action plan · Work with industry on water quality · No new dollars…fixed revenue from flood control district…action plan developed…correction on revenue side needed
Joel Ingram – WDFW hydraulics permits	· Working with fish and fsh habitat for past 12 years…4 years in Whatcom County · Salmon recovery · Permitting for hydraulic · 5 year plans – certainty about what is expected by WDFW…planning and process work beforehand…revisit each five years · Windows of work · Beaver management, trash racks, · Project work, agreements, streamline process
Aneka Sweeney – WCD Education Specialist	· Packet of information…Conservation District · How to best develop programmatic permits · If you need assistance with projects, information · Assist land managers with conservation choices · 5 year planning…preservation of future of farming · Develop educational program to preserve farming in Whatcom County · Farm Speaker series in cooperation with AWB and WCD…different subject matter · Education in schools about natural resources · Communication plan development · Water quality education group · Grant writing support for partnership programs · Insurance for Farm Tours
Jim Bucknell/Andy Dunn – RH2 Engineering – water right preparation	· Civil engineering firm · Water rights expertise · 35 years' experience with Ecology…change applications

	· Understand water law, statutes, regulations, and know the people · Drought contingency plan, water bank, water exchange · Lummi projects…water for in stream and out of stream – how to move water around for projects…resolving issues · Study with PUD on water rights
Heather MacKay/Cheryl Lovato Niles – FHB Consulting – plan development	· Work with Henry for several years · Banking and trading of water · Whatcom County – Ag watershed data…copy for each WIDs · Worked with each WID regarding priorities and restoration of flow and habitat…need for farming and need for habitat · Worked with farmers on planning resources · Detailed priorities, reference maps, species, ag lands cover…available for each WID · Working with Sumas WID on action plan
Erika Douglas – WCPW – water quality	· Water quality monitoring…bacteria driven · Drainage into key areas · Working with Canada · Routine monitoring throughout drainages in Whatcom County · Seeing water quality areas of concern…focused areas…North Lynden, Nooksack, · Seeing what is going on…pollution prevention program…on hot spots, practice application · Not just one source of pollution…talking with folks about various pollution sources · Partners with Whatcom CD · Success in Drayton Harbor…attributed to community coming together…whole combination of community coming together
Steve Jilk – PUD #1 General Manager	· County wide economic development program · County wide water planning · City administrator…Lynden · One of three agencies with authority to operate and manage water resources in Whatcom County · Took on electricity supply…took on water rights…service of water to BP refinery · Have most water rights in county · Separate irrigation water rights · All of Cherry Point, Ferndale – West, I-5 Grandview Industrial Park · Engaged in watershed planning board · Try to play a problem solving role in water quality · Worked with Bellingham and partners on Lower Nooksack strategy…water supply plan…broad 40,000 ft level of water resources tied to planning · Water supply group

Kent Oostra – Exact Scientific Lab	· Resident of Whatcom CD · E.coli as monitoring · DNA sequencing – non targeted · $20,000 in research regarding DNA testing specific to related · Running fecal Whatcom CD · Looking at Nooksack from mountains to ocean · Bio indicators and what profile is · Tracking sources for $125 per sample · Needing to build a data set now · FDA requiring this type of testing
David – N3	· Drayton WID Board · Feedback loop is very important and open to suggestions on how to do this better · Water test indicating very good · One item is water nitrates…much better than 10 years ago · On committees…must have agriculture representation…see what is going on