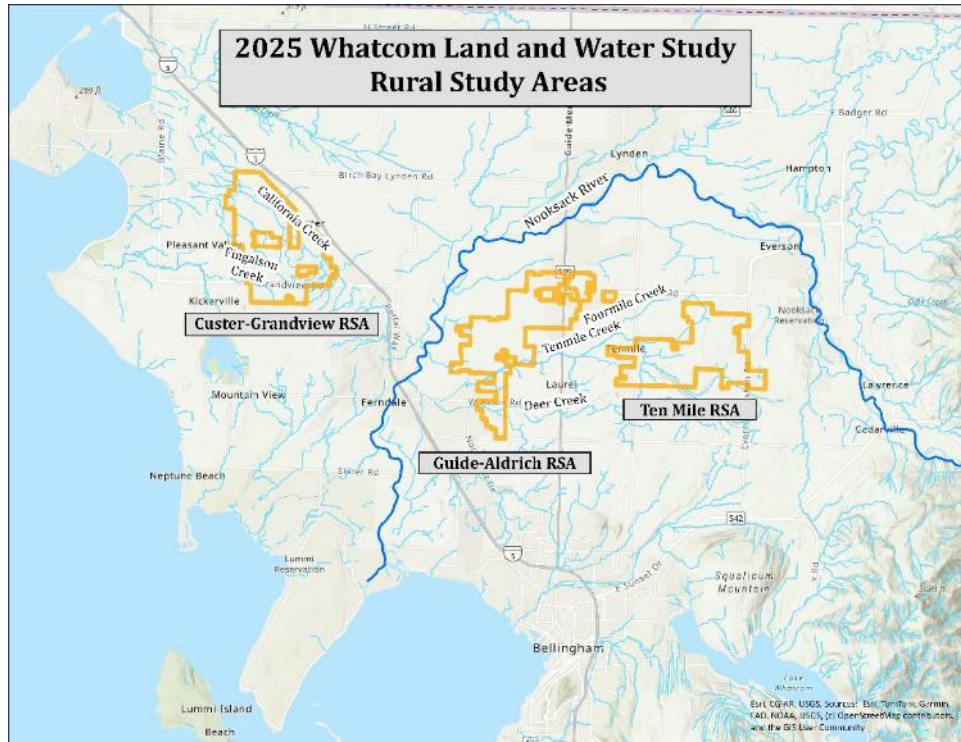


Land and Water Integration Study

Whatcom County

November 24, 2025



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For: WRIA 1 Planning Unit

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Executive Summary

The Land & Water Integration Study was initiated to evaluate existing land use designation and available water supply in three Rural Study Areas: Custer-Grandview RSA, Guide-Aldrich RSA, and Ten Mile RSA. In the review of Rural 5A and Rural 10A parcels, the Study found that there are 888 existing development units and 756 potential additional development units across the three RSAs. More than 70% of the acreage in Ten Mile and Custer-Grandview RSAs and nearly 56% of Guide-Aldrich acreage is comprised of parcels of 10 acres or greater. There are currently insufficient senior irrigation water right quantities within the RSAs to support conventional irrigation and crop demands compared to other parts of the County. There are also not enough available existing water system connections to support potential development build-out which would likely result in additional exempt well development for those domestic needs. The Study identified alternative agricultural practices and water supply which included, potential senior water rights (subject to willingness of owners of those rights) to support new uses, infrastructure needs, water allocation tools and low water demand agricultural practices which would need further investigation. It is a priority to integrate land and water planning to bring both into alignment and protect large tracts of land from fragmentation, in order to support the 100,000-acre farmland preservation goal. In the near-term, it may be important to protect those lands which may support commercially viable agriculture while available water supply is identified. Consistent with the WRIA 1 Planning Unit approved comments of February 28, 2024, provided to Council, we advise that Whatcom County, "Better integrate land use (zoning) with available water supply to build resilience to current and future climate impacts."

Introduction and Background

The Planning Unit provided recommendations to the Whatcom County Council in 2024 and initiated this Study to convey the importance of better integrated water and land use planning in the development of the 2025 Comprehensive Plan update. The goal of the Land & Water Integration Study (Study) is to understand how land use designation and available water supply in three Rural Study Areas (RSAs) align, through a review of existing parcel land use designation, parcel development potential, existing or potential water supply to the RSA, and alternative agricultural practices. Washington Water Trust (WWT) closely coordinated with the staffs of Whatcom County Public Works, Whatcom County Planning & Development Services, a Land and Water Integration Study Project Team and received and integrated comments from the Whatcom County WRIA 1 Planning Unit.

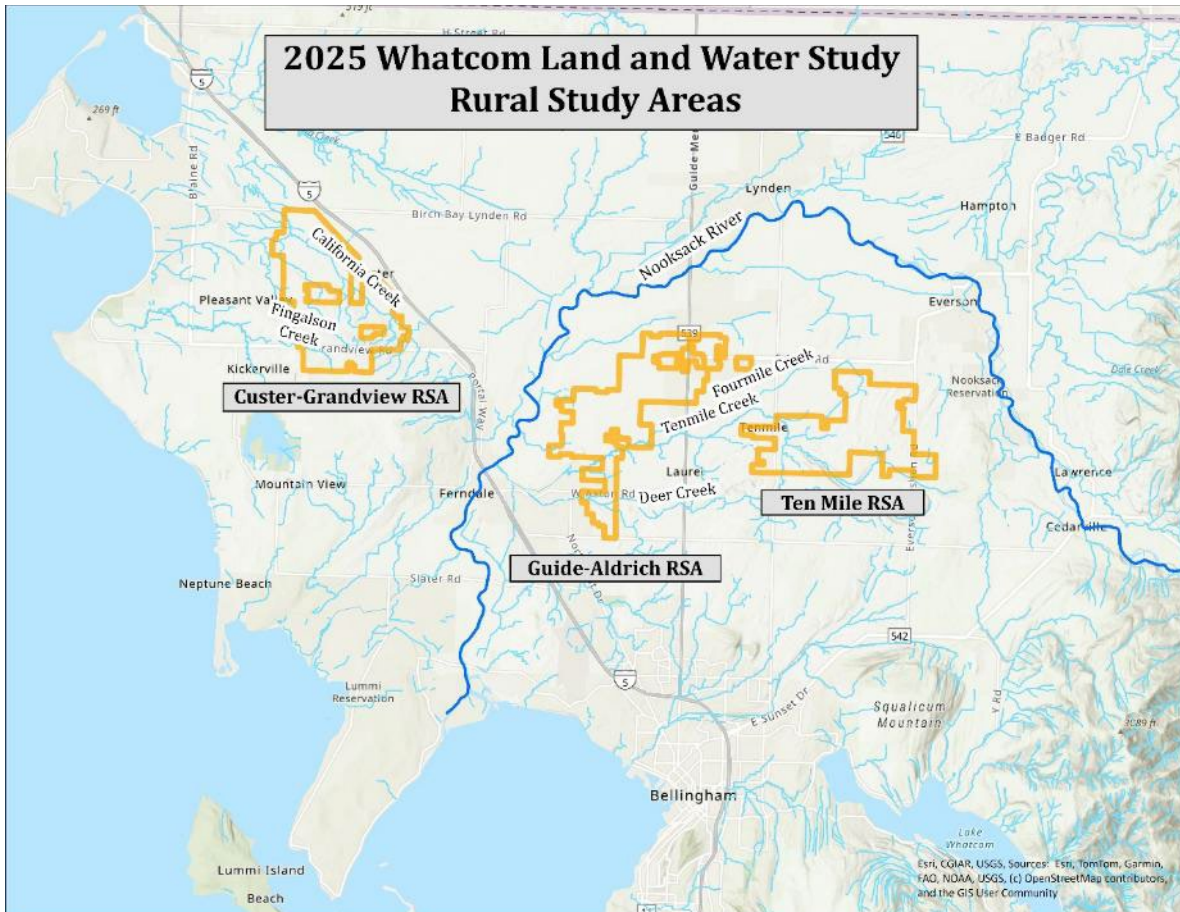
This Study draws on existing efforts and previous studies, including the Whatcom County Rural Land Study (2007), the Whatcom County Rural Land Study 2019 Update, the Whatcom County Agricultural Land Assessment (ALA) (2025 update to Rural Land Study 2019), the Whatcom County Coordinated Water Supply Plan (2019 & 2025), and the PUD No.1 Regional Water Supply Plan Phase 2 Report, to understand the relationship between land use and water resources within three RSAs.

Since 1990, the Washington State Growth Management Act (GMA) has required Whatcom County to produce and periodically update a Comprehensive Plan to manage population growth, including expansion of Urban Growth Areas (UGAs) (MRSC). Whatcom County's first GMA-compliant Comprehensive Plan was finalized in 1997. One of the requirements of the GMA is to "map, classify, and designate Agricultural Resource Lands (ARLs), which are lands of long-term commercial significance to the agricultural economy" (Whatcom PDS, ALA 1). The classification criteria for ARLs are outlined in WAC 365-190-815 and included in the 2016 Comprehensive Plan. WAC 365-190-815 requires that designated ARLs must be "protected by appropriate zoning and development regulations to ensure incompatible uses...don't impede agricultural uses" (Whatcom PDS, ALA 1). Additionally, as part of the 1997 Comprehensive Plan, Whatcom County identified a farmland preservation goal of 100,000 acres which was affirmed in the Whatcom County resolution 2009-04014 (Whatcom CC).

The Rural Lands Study (2007) identified areas designated as Rural (where there is R5A and R10A zoning) which contained lands of commercial significance as outlined in the Washington State GMA criteria for ARLs, referred to as Rural Study Areas (RSAs). The 2019 update created 22 RSAs and analyzed data to determine farmland loss within them. Despite the RSAs meeting the ARL criteria to varying degrees, Whatcom County did not redesignate the RSAs as ARLs.

The 2025 Agricultural Land Assessment, which is currently in progress, is a County-wide analysis that identifies lands that meet the criteria of agricultural lands of long-term commercial significance per WAC 365-190-050 and assesses land use trends across the agricultural land base. The 2025 ALA also addresses loss of ARLs to expansion of UGA boundaries for three cities, Everson, Nooksack, and Sumas, who are proposing to expand their UGAs as part of the 2025 Comprehensive Plan update. The updated boundaries would incorporate lands currently designated as Agriculture into the UGA. As part of the GMA requirement, the ALA will identify potential mitigation options to address the loss of ARLs (Whatcom PDS, *ALA* 8). The ALA confirmed what the past Rural Land Studies identified: Rural Study Areas meet many of the criteria for “agricultural lands of long term commercial significance.” Per WAC 365-196-815, Counties “must adopt development regulations that assure the conservation of designated agricultural, forest, and mineral lands of long-term commercial significance” (3). The ALA explores options to address WAC 365-196-815 and implement stricter measures, such as potentially rezoning to Small Lot Agriculture Districts, strengthening conservation easements, and developing policies to minimize non-agricultural development.

In light of potential re-designation to Agricultural, the Study evaluates the relationship between land use and water resources in three RSAs: Custer-Grandview RSA, Guide-Aldrich RSA, and Ten Mile RSA. These RSAs were identified in the ALA and past Rural Land Studies as having high agricultural value and meeting many of the ARL designation criteria (Whatcom County PDS, *ALA* 6). The Study includes the review of the Rural 5A and Rural 10A parcels, their existing and potential residential development, available water supply, potential water supply, and conceptual alternative options for viable agricultural land.



Project Area Map

In the initiation of the Study, WWT staff met with the Land & Water Project Team, comprised of staff from Whatcom County Public Works, Whatcom County Planning and Development Services, Birch Bay Water and Sewer District, the Ag Water Board, and a manager of small water systems in the County, on three occasions to discuss scope, secure input, and shape the Study approach.

To understand the relationship between land and water, WWT reviewed:

- Count and parcel size class of existing parcels within the three RSAs;
- Environmental features of each RSA;
- Existing water supply to serve identified parcels with agricultural potential;
 - Water rights
 - Water systems
- Conceptual water supply alternatives and cultivation practices for viable agricultural lands in RSAs; and
- Recommendations.

Rural Study Areas

All three RSAs are located in north Whatcom County where agriculture is the dominant land use (Whatcom County PDS 44, 56, 58). European settlers began farming in Whatcom County in the late 1800s following the clearing of forestlands. Hops, potatoes, lettuce, celery, summer fruits, flowers, dairy and poultry were among the primary products. The first creamery in the County started in 1892 in Custer, though Lynden became the center of dairying in the 1900s. Whatcom County continues to support one of the largest dairy economies throughout the Pacific Northwest (Oakley). Over the past 50 years, Whatcom County has become a major hub of raspberry and blueberry farms, with 90% of American-grown frozen raspberries coming from Whatcom alone (Varriano).

While agriculture protections existed in Whatcom County prior to 1991, the legislature passed the Growth Management Act (GMA) in 1991 which identified criteria for Agricultural Resource Lands and required the protection of these lands through land use regulations (Whatcom County PDS 5). The Agriculture Designation helped determine local agricultural zoning requirements, which allows for 1 development right per 40 acres. The RSAs contain working farmland and meet many of the GMA criteria for designating Agricultural Resource Lands; however, these areas are designated as Rural and zoned as either Rural 5A (1 development right per 5 acres) or Rural 10A (1 development right per 10 acres). Due to the different subdivision regulations in the Rural zone, RSAs are more susceptible to development pressure and parcelization.

The focus of this Study is to evaluate the relationship between land use and water resources in three of the 22 RSAs. Whatcom County Public Works and Whatcom County Planning and Development Services (PDS) selected these three RSAs as the highest priority for this Study due to the RSAs meeting the majority of the GMA criteria.

The Project Area Map above displays the location of the RSAs which are briefly described below. Please note that this Study is a desktop exercise and actual observations may differ from the data provided.

Custer-Grandview

(3,774 acres)

The Custer-Grandview RSA is located west of Interstate 5 and Portal Way, east of Lake Terrell and the British Petroleum (BP) Cherry Point Refinery, and northwest of the City of Ferndale. It is within the Drayton Harbor and Birch Bay watersheds. California Creek, a salmon-bearing stream which flows into Drayton Harbor, enters at the southeast corner of the RSA and flows northwest to the northwest corner of the RSA.

Guide-Aldrich

(3,696 acres)

The Guide-Aldrich RSA is located east and south of the mainstem of the Nooksack River, west of the Ten Mile RSA, and east of the City of Ferndale. It is within the Wiser Lake/Cougar Creek and Barrett Lake watersheds. Tenmile Creek, which flows southwest into the Nooksack River, and Deer Creek, a tributary to Tenmile Creek, bisect the middle of the RSA.

Ten Mile

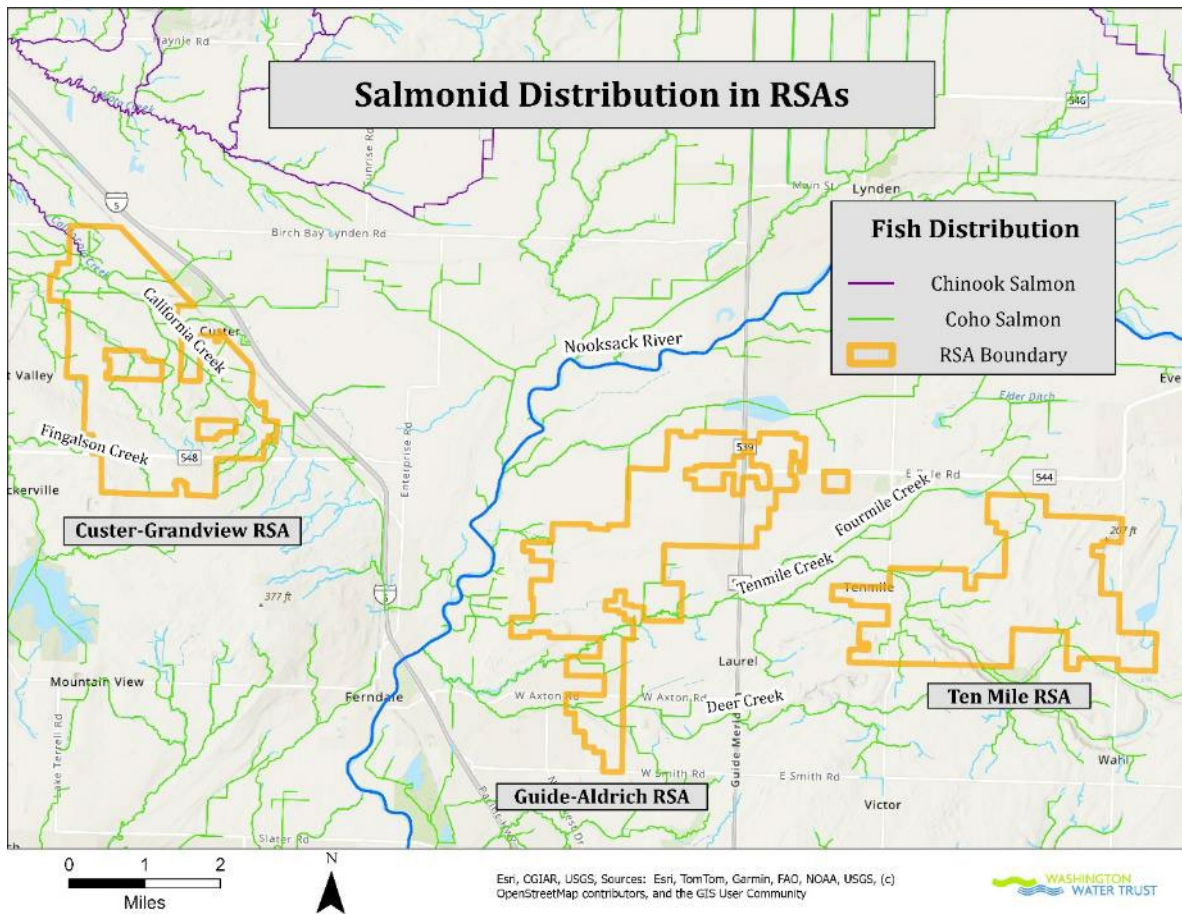
(3,320 acres)

The Ten Mile RSA is west and south of the mainstem of the Nooksack River. It is within the Barrett Lake watershed. Portions of Tenmile Creek, a tributary to the Nooksack River, and Fourmile Creek, a tributary to Tenmile Creek, are within this RSA.

RSA Environmental Features

Each of these RSAs contain important environmental attributes including those which are environmentally sensitive and comprise the Whatcom County Critical Areas Ordinance (CAO), Critical Areas, as defined by the Growth Management Act, include wetlands, critical aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas. While this Study did not map Critical Areas, we recognize that the compendium of factors which define these areas are also within the RSA lands. Other significant attributes within the RSAs include the presence of wetland and floodplains, salmonid utilization, and flow conditions.

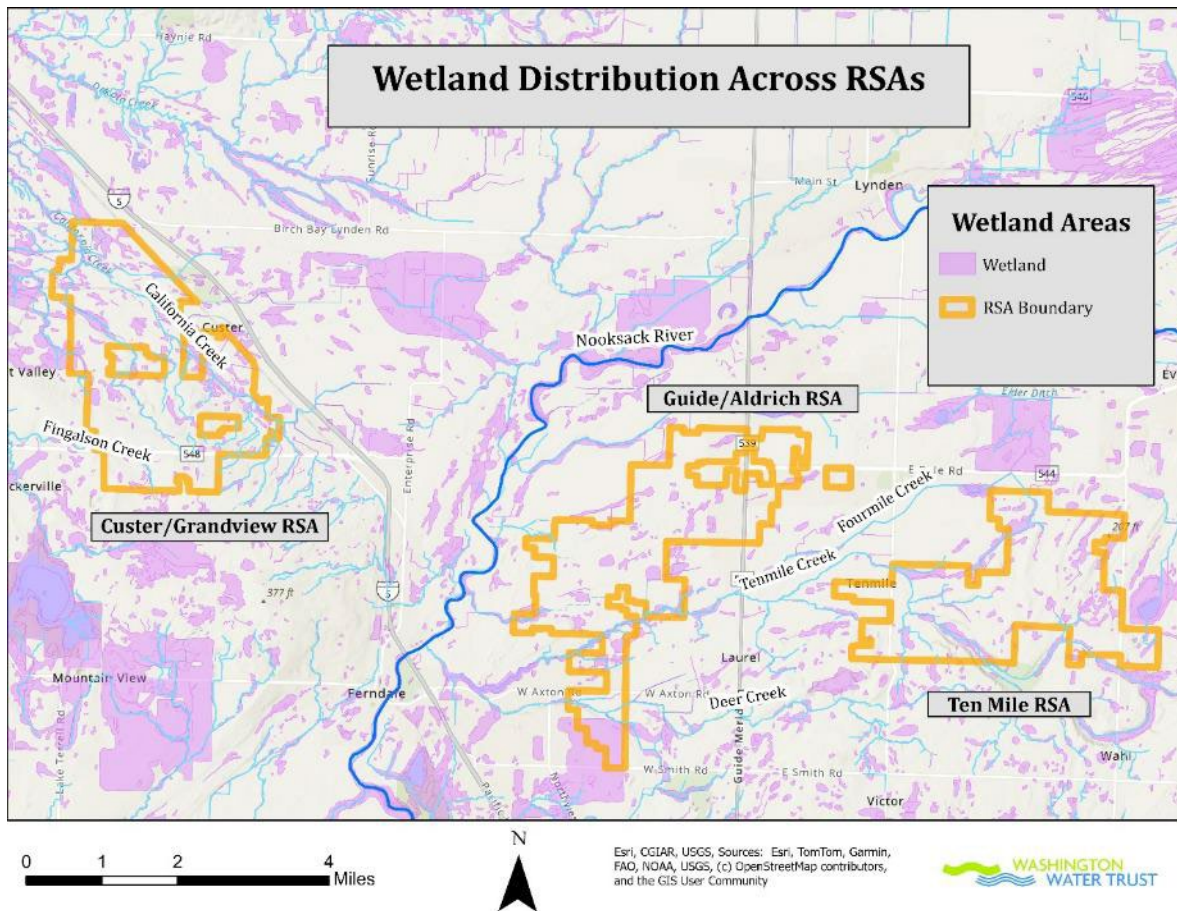
While not an exhaustive list, key measures of environmental function and health within the RSAs include streams closed to new surface water uses, flow limited streams, a decline in wetlands, as well as the need limiting factors for salmon recovery. In the review of land use and water availability in this Study, it is essential to factor in these environmental features when considering any modification to land uses or provision of additional water supply to RSA parcels.



The Nooksack River is home to three salmonid species listed as threatened under the Endangered Species Act (ESA), chinook, steelhead, and bull trout, in addition to coho, pink, chum, and sockeye. Salmon recovery efforts have been focused on restoring habitat and ecological processes, addressing fish passage barriers, improving instream flows, and reducing ongoing anthropogenic impact (WRIA 1 Salmon Recovery Board). Multiple salmonid species utilize portions of streams found within the RSAs as shown in the table [Fish Distribution within RSAs](#) (WDFW). Please note the Study is a desktop exercise which relied on fish data provided by WDFW and actual observations may differ. The [Salmonid Distribution Map](#) displays the location of coho and fall chinook-bearing streams as an illustrative example of salmonid presence throughout the three RSAs.

Fish Distribution within RSAs			
RSA	Species	Stream	Fish Distribution
Custer-Grandview	Fall chinook	California Creek	Potential Presence
	Coho	California Creek	Documented Rearing, Spawning
	Winter Steelhead	California Creek	Documented Presence
	Bull trout	California Creek	Presumed Presence
	Coho	Fingalson Creek	Presumed Presence
	Bull trout	Fingalson Creek	Presumed Presence
	Coho	Deer Creek	Documented Presence
	Winter steelhead	Deer Creek	Presumed Presence
	Bull trout	Deer Creek	Presumed Presence
Guide-Aldrich	Coho	Tenmile Creek	Documented Rearing
	Winter steelhead	Tenmile Creek	Documented Presence
	Bull trout	Tenmile Creek	Presumed Presence
Ten Mile	Coho	Tenmile Creek	Documented Presence
	Coho	Fourmile Creek	Documented Presence
	Winter steelhead	Tenmile Creek	Documented Spawning
	Bull trout	Tenmile Creek	Presumed Presence
	Bull trout	Fourmile Creek	Presumed Presence

With declining flow in many streams across Whatcom County, the Washington State Department of Ecology (Ecology) implemented an instream flow rule in 1985 which established minimum flow levels on the mainstem Nooksack and tributaries, and set conditions for new uses including closures, partial closures and low flow provisions (Ecology, *Instream Resources - Nooksack*). California Creek, which bisects the Custer-Grandview RSA, and Terrell Creek, which has a tributary which crosses through the southwest corner of the same RSA, are closed either permanently or partially due to a lack of water. Emphasizing the significance of low flow conditions, *The Salmon and Steelhead Habitat Limiting Factors in WRIA 1, the Nooksack Basin* (2002), states that the "...stream closures accentuate the need to preserve stream flows, and the extensive amount of water rights (especially in Dakota and California Creeks) strongly suggest that efforts should be made to reduce water withdrawals. These concerns result in a 'poor' rating for low stream flows" (Smith 194). The "poor" rating for low stream flows, which contribute to elevated stream temperatures and fish passage concerns, significantly affects salmon distribution and recovery. Improving instream flow and sustainably managing instream/out of stream water demand is central to salmon recovery.



A priority action for the WRIA 1 Salmon Recovery Plan is to integrate floodplain management with salmon recovery. The Lummi Nation chapter of the 2020 State of Our Watersheds report identifies a declining trend for floodplain wetlands to be addressed in salmon recovery (Northwest Indian Fisheries Commission 107). The WRIA 1 Salmon Recovery Plan (2005) also prioritized implementation of “a policy of “no net loss” of area or function for wetlands that provide or support salmonid habitat” (70). The Wetland Distribution Map displays the approximate location of wetlands within the RSAs.¹ Given the priority for salmon recovery, the presence of wetlands should be explored and considered when exploring any land use modifications.

Critical Areas, as defined by the Growth Management Act, include wetlands, critical aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, and

¹ Whatcom County Wetland Data Sources Disclaimer: The wetlands map is a conglomeration of Whatcom County's GIS data related to wetlands. These data are intended only as a flag indicating further review may be necessary. See Critical Areas Ordinance Article VI – Wetlands Map.

geologically hazardous areas.² While this Study did not map Critical Areas, we recognize that the compendium of factors which define these Areas are also within the RSA lands.

Lands Evaluation

The principal reference point for assessing lands within each RSA were the tax parcels zoned as either R5A or R10A, their estimated current acreage, the count of existing residential units, referred to as Existing Development Units (EDUs), and the residential development potential of each parcel, referred to as Potential Additional Development Units (PADUs). Understanding the development potential involves identifying the existing unexercised development rights, or potential development.

Parcels zoned R5A are allotted one residential development right per 5 acres and parcels zoned R10A are allotted one development right per 10 acres. For example, a 10-acre parcel zoned R10A would be assigned one development right, but a 20-acre parcel of the same zoning would be assigned two development rights.

Data provided by Whatcom County Planning and Development Services (PDS) calculated the Existing Development Units (EDU)s, Total Potential Development Units (TPDU)s and Potential Additional Development Units (PADU)s of rural tax parcels based on their current zoning designation and 2022 Whatcom County Assessor's parcel data (Whatcom PDS 3-4). The 2022 parcel data was used to estimate EDUs by assuming parcels that have tax assessor improvement values greater than \$10,000 had utilized the development right. TPDU was calculated by using the tax assessor parcel acreage and zoning to determine the number of development rights the property may have. PADU was calculated by subtracting the EDU from the PDU.

Accessory Dwelling Units (ADU)s were not included as part of the calculations, as they are tracked under Administrative Permits which do not differentiate between ADU permits and other Administrative Permits³. In addition, in the case of use or development of a rural well, ADUs, as an accessory to the primary, would fall under the same water budget of 500 gallons per day (gpd) as allowed for rural wells (*Ecology, Nooksack Amendment*).

To understand the existing fragmentation of parcels within the subject RSAs, parcels were organized into four Parcel Size Classes and the total acreage of each Parcel Size Class was calculated. The Parcel Size Classes are categorized as:

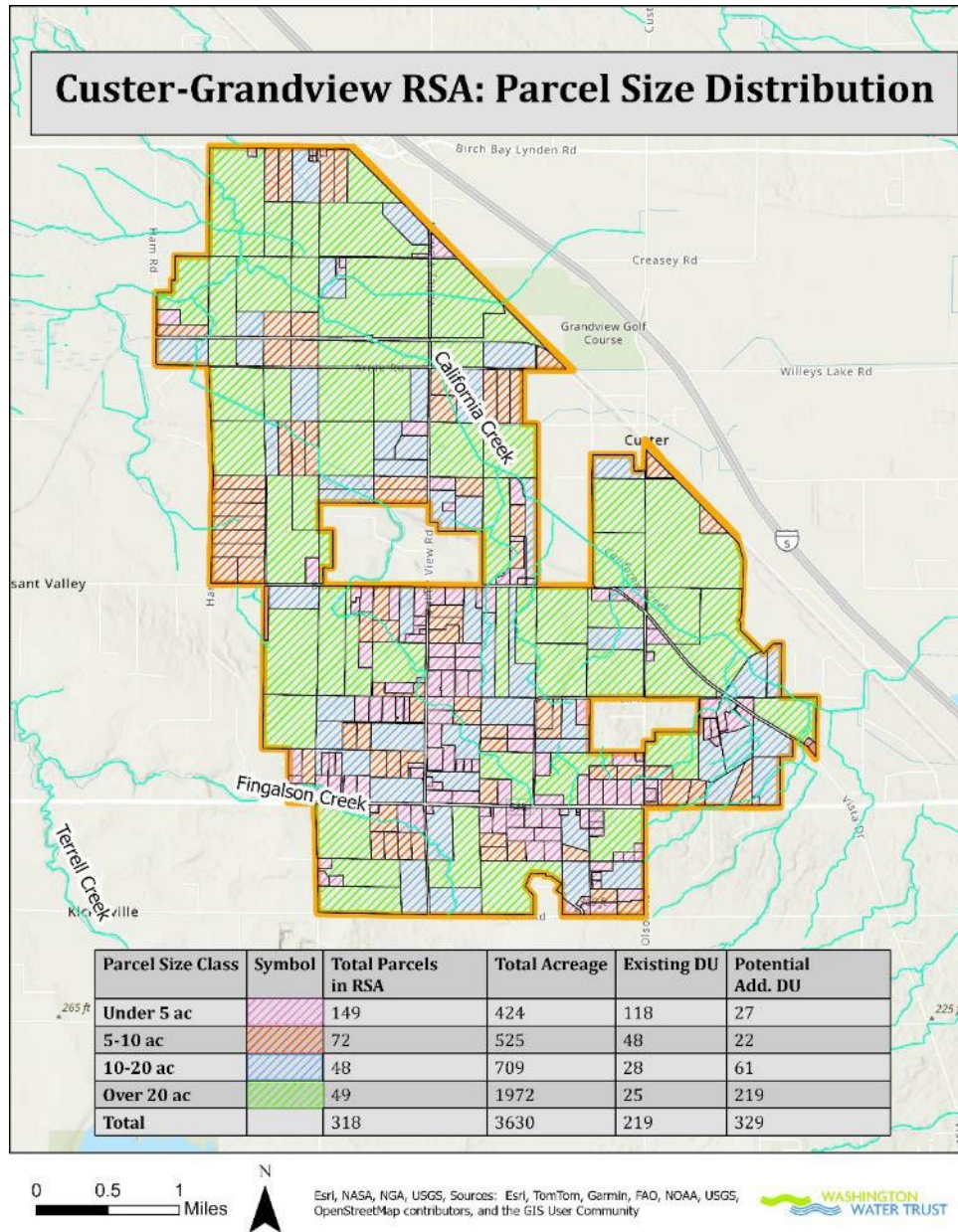
² Per RCW 36.70A.030 (12)

³ Per Whatcom County Code 20.36.130

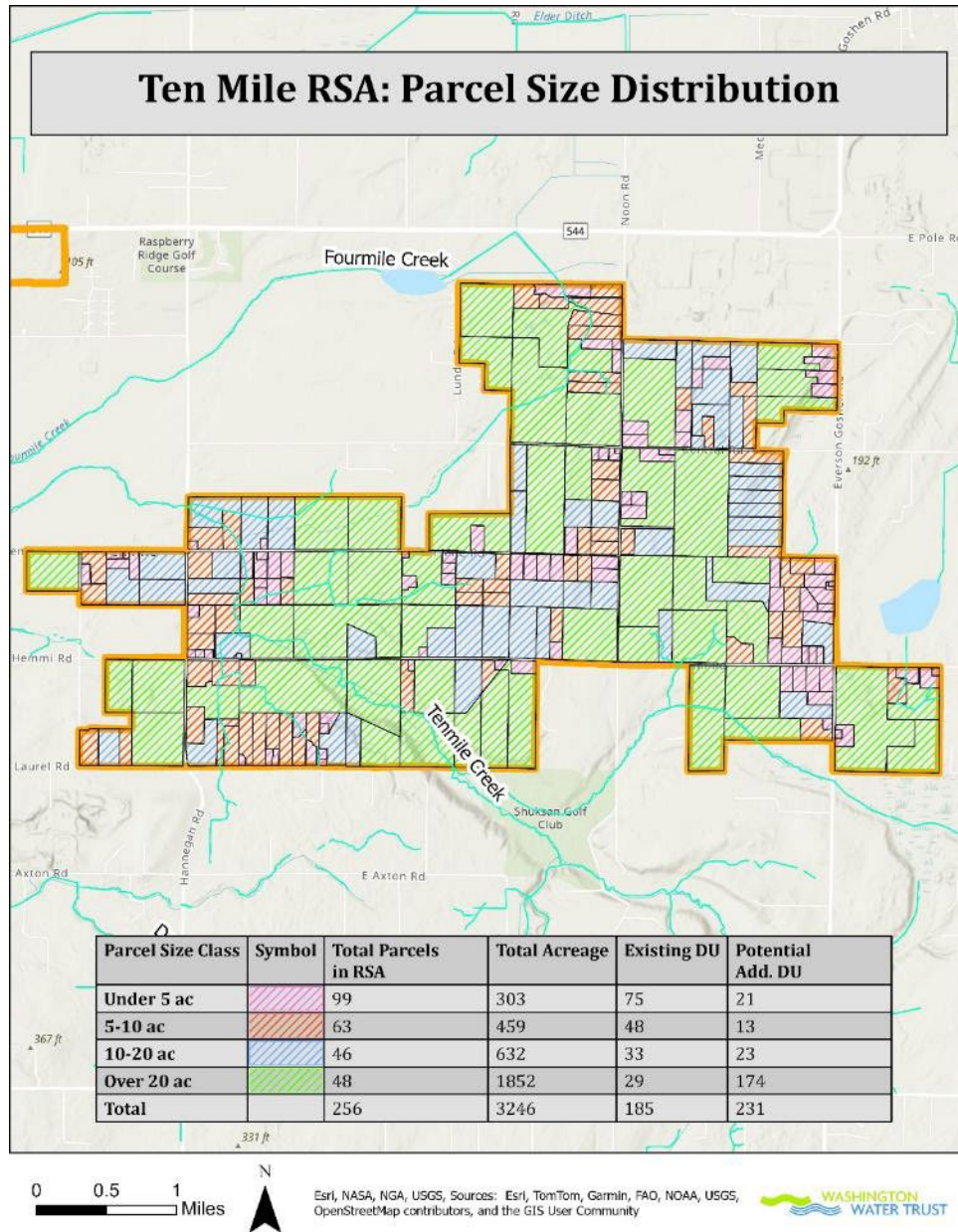
Parcel Size Classes
Under 5 acres
5-10 acres
10-20 acres
Over 20 acres

Findings

The following Parcel Size Maps show the breakdown of the Parcel Size Classes and their associated acreages, in addition to the existing and potential development as displayed in development units.



As shown in the Custer-Grandview Parcel Size Map, 46.8% of all parcels within the Custer-Grandview RSA are less than five acres (149/318 parcels). There are 97 parcels within the 10-20 acre and over 20-acre Parcel Size Class (97/318 parcels) which cover 2,681 acres or 73.9% of the total RSA acreage.



As shown in the Ten Mile Parcel Size Map, 38.7% of all parcels within the Ten Mile RSA are less than five acres (99/256 parcels). There are 94 parcels within the 10-20 acre and over 20-acre Parcel Size Class (94/256) which cover 2,484 acres or 76.5% of the total RSA acreage.

Water Availability

The Lands Evaluation section of this Study identified parcels with R5A and R10A zoning designation across the three RSAs with development risk and ongoing agricultural potential. Consistent with the 2025 Whatcom County Comprehensive Plan update goal 8A, “*Securing an adequate, sustainable, and legal supply of irrigation water sufficient to support the long-term viability of the local agricultural industry,*” (Whatcom County 8-8). The goal of in this section - *Water Availability* - is to identify the availability of existing water or agricultural practices which may support the agricultural viability of each potential agriculturally zoned parcel. The Water Availability evaluation identifies current water systems with service areas which overlap the subject RSAs as well as the presence of irrigation water rights with place of use (POU) that intersect the RSAs.

Water systems which overlap the RSAs hold three critical features which may influence the future of parcels within the RSAs: a valid water right, infrastructure to deliver water, and potentially additional unutilized yet authorized water system connections.

Water rights with irrigation as a purpose of use, if consistently used over time, may be able to serve existing or future water needs within the RSA depending on the historic “beneficial use”, as well as the legally authorized quantities and places of use. Any new water uses sought, would need to identify an existing valid senior water right which may be transferred to the new place of use through a Washington Department of Ecology change process or pursue a new water right which if granted would be interruptible to instream flows (Ecology, *Changes to Water Rights*).

Water Rights

Water law in Washington is primarily based on the framework of “prior appropriation”, which establishes a seniority system of water rights ranked by first use and a priority date. The Nooksack instream flow rule established in 1985⁴ to protect instream resources, designated minimum flow levels and closed some subbasins to new water rights (Ecology, *Nooksack Rule*). The rule with a priority date (12/4/85), effectively established the line between “senior” water users and “junior” water users.⁵ If instream flows at specific measuring points, are at or below the regulatory instream flow level, those with a priority date after the rule are “interruptible” and are required to cease their diversions or withdrawals.

A water right is legal permission to divert or withdraw and use fresh water (a public resource) in Washington.⁶ Water rights may be in the form of a claim, water right permit, or

⁴ Per Chapter 173-501 WAC

⁵ Ibid. 4

⁶ Per Chapter 90.03 RCW

certificate. The claim is an “asserted use” which may have first begun prior to the Washington state surface water code of 1917⁷ or the ground water code of 1945⁸. A water right application, if accepted, may result in a water right permit and, if approved by Ecology, ultimately a water right certificate. A certificate is a “perfected” water right that authorizes the quantities, purposes, season of use and where the water may be withdrawn (ground water) or diverted (surface water). Among the potential water right purposes include irrigation, domestic, municipal, industrial, stock-water, hydropower, and streamflow.

For water rights to remain in good standing, water must be put to “beneficial use” and there may be no lapse of five years or more of consistent use for all or part of the water right. Beneficial use is the application of a reasonable quantity of water to a non-wasteful purpose of use. Non-use of a water right may risk a diminishment or relinquishment of the asserted (claims) or authorized (certificates)(Ecology, *Relinquishment*). Any proposed changes to a water right require going through an Ecology change process, including an “extent and validity” review of historic beneficial use of the water right.

Nooksack Adjudication

As in other basins in Washington, there is uncertainty as to how existing water rights match the physical availability of water. In some basins there has been an over appropriation of authorizations and assertions of water rights compared to the physical availability of water—more demand than supply. The Nooksack Basin is currently undergoing a basin-wide adjudication to sort through and determine water right quantities, the place in line “priority” of water rights and whether the asserted water right use is legal. This process administered by Ecology will ultimately result in a comprehensive decree and final determination of water rights by a Whatcom County Superior Court judge, and will include federal, tribal and other water rights in the basin (Ecology, *WRIA 1 Adjudication*).

RSA Water Rights

To evaluate existing water rights within the RSAs that could support agricultural users, a water rights assessment of rights with irrigation as a purpose of use is undertaken, which may replicate an Ecology review of a water right change. The assessment reviews 2-3 years of aerial imagery and seeks to delineate cultivated or irrigation lands (potential beneficial use) that are within the water right place of use. This desktop assessment can identify water rights which overlap a defined area (i.e. RSA), associated quantities, the anticipated quantities of use and the likely consistent beneficial use.

In this Study, the irrigation delineation was not in the Scope of Work, but the principal first step toward understanding potential water supply was to identify water rights with

⁷ Ibid 6

⁸ Per Chapter 90.44 RCW

irrigation as a purpose of use, which overlap each RSA. Understanding the actual quantity of water that has consistently been used from these water rights be informed by a water rights assessment and a direct conversation with the water user to corroborate desktop findings. Any decision related to a determination of beneficial use or potential relinquishment would be the sole purview of Ecology. See the Irrigation Water Rights tables below for irrigation water right aggregate quantities by RSA. The map that follows shows the identified Place of Use (POU) for those water rights in different colors as well as a representation of the path of the PUD No.1 pipeline. Please note that some of these water right POUs may overlap which may serve as non-additive quantities to a primary water right.

<i>Custer-Grandview RSA Irrigation Water Rights</i>	Qi (cfs)	Qa (Acre Feet/Year)	Acres
WR Certificates	1.8	399.8	278
WR Claims	N/A	N/A	66
Totals	1.8	399.8	344

According to Ecology's records, there are 20 water rights and claims with irrigation as a purpose and a source in the Custer-Grandview RSA. These certificates and claims authorize/assert the use of 399.80 acre-feet/yr (afy) and 1.80 cubic feet per second (cfs).⁹

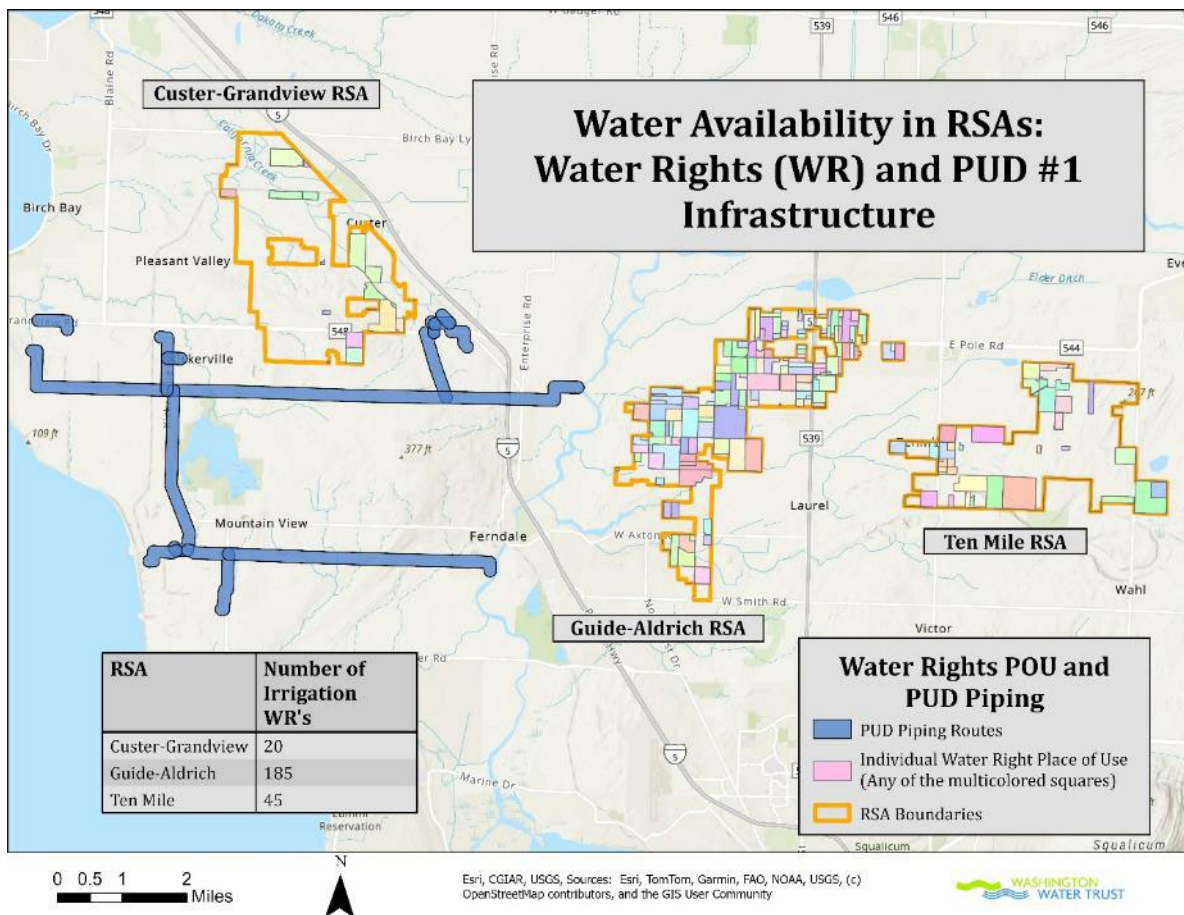
<i>Guide-Aldrich RSA Irrigation Water Rights</i>	Qi (cfs)	Qa (Acre Feet/Year)	Acres
WR Certificates	20.22	2,809.26	1,635.68
WR Claims	0.76	35	581
Totals	20.98	2,844.26	2,216.68

According to Ecology's records, there are 76 water rights and claims with irrigation as a purpose and a source in the Guide-Aldrich RSA. These certificates and claims authorize/assert the use of 2,844.26 acre-feet/yr (afy) and 20.98 cubic feet per second (cfs).

⁹ It should be noted that the ac-ft/yr and the cfs are two distinct measurements that represent two separate time-scales. Ac-ft/yr is the measure of how much water is used throughout the irrigation season, while cfs is a measure of how much water a water right holder may take at any one moment in time. Because irrigation does not occur continuously throughout the day everyday, the ac-ft/yr on any given water right will always be significantly lower when converted to cfs than the authorized instantaneous quantity, which is measure in cfs.

<i>Ten Mile RSA Irrigation Water Rights</i>	Qi (cfs)	Qa (Acre Feet/Year)	Acres
WR Certificates	5.3	770	510
WR Claims	0.31	44.74	170
Totals	5.61	814.74	680

According to Ecology's records, there are 39 water rights and claims with irrigation as a purpose and a source in the Ten Mile RSA. These certificates and claims authorize/assert the use of 814.74 acre-feet/yr (afy) and 5.61 cubic feet per second (cfs).

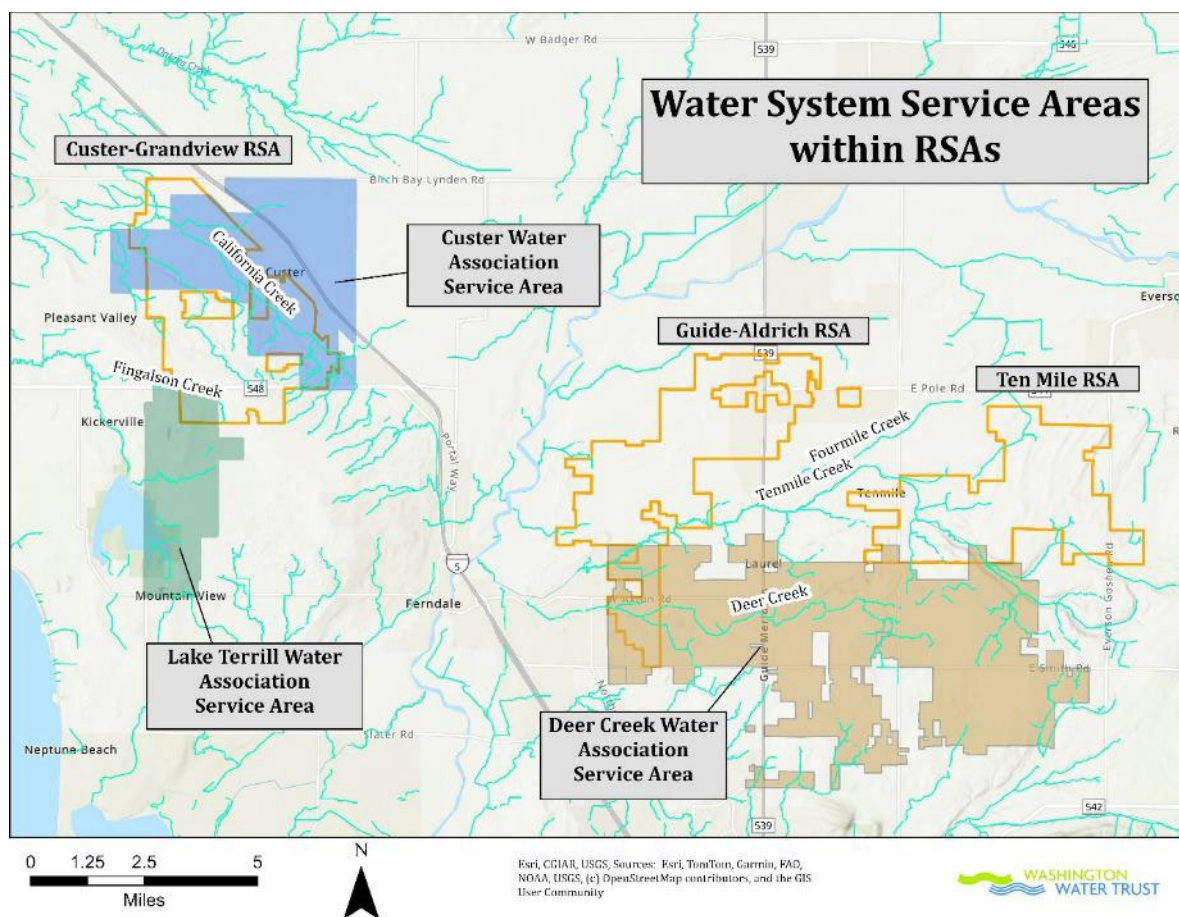


As the Water Availability Map and Irrigation Water Rights tables indicate, the largest concentration of irrigation water rights is within the most developed RSA, Guide-Aldrich. This prevalence of water rights and fewer larger parcels than the other two RSAs, would require additional beneficial use analysis to understand the status of those water rights,

and does invite the need for more pro-active management of existing water rights to ensure they remain in good standing.

Water Systems Serving RSAs

Water systems deliver water to customers within Washington Department of Health (DOH)-approved water service areas. Systems are delineated between Group B which serve less than 15 connections and generally are reliant on an upper limit of 5,000 gallons per day; and Group A systems which serve 15 or greater connections which is limited by the water right quantities which support that system and the number of connections by the DOH in the approved water system plan. WWT sought to understand which Group A water system service areas overlapped the RSAs, have remaining connections available and may have the physical capacity to deliver water beyond domestic use.



The Whatcom County Coordinated Water System Plan was last updated in 2016 and is currently in revision by the County and the Water Utility Coordinating Committee. In consultation with Project Team member Dave Olson of Water Systems Inc, a manager of small water systems in Whatcom County as well as Vice-Chair Water Utility Coordinating

Committee in the Coordinated Regional Water System Plan, he indicated that many small water systems have long waiting lists for existing connections and are unlikely to have additional capacity (Olson). The Water Systems and RSAs tables indicate which systems do and do not have available connections.

Water Systems and RSAs		
RSA	No Connections	Connections
Custer-Grandview	<ul style="list-style-type: none"> •Old Settlers Water Assn •Thornton Water Assn (unknown #) •Bakerview Water Assn •Smaller Systems 	<ul style="list-style-type: none"> •Custer Water Assn (76)
Guide-Aldrich	<ul style="list-style-type: none"> •Guide Meridian Water Assn •Pole Road Water Assn 	<ul style="list-style-type: none"> •Lake Terrill Water Assn (60) •Deer Creek Water Assn (unknown #)
	<ul style="list-style-type: none"> •Smaller Systems 	
Ten Mile	<ul style="list-style-type: none"> •Joe Louie Water Assn 	<ul style="list-style-type: none"> •Lake Terrill Water Assn (60)
	<ul style="list-style-type: none"> •Hemmi Rd Water Assn 	<ul style="list-style-type: none"> •Deer Creek Water Assn (unknown #)
	<ul style="list-style-type: none"> •Meridian School Complex •Smaller Systems 	

The Guide Meridian Water Assn has a 10" main which runs along Guide Meridian corridor and the Pole Road Water Association also has a 12" main which also runs along the same corridor. There are only three water systems with available connections which overlap the subject RSAs: Custer Water Association, Lake Terrill Water Association, and Deer Creek Water Association.

The Water Systems Service Areas Map shows the service areas for water systems which have available connections. The number of available connections is for the complete service area of each association, which is greater than the boundaries of each RSA and therefore the available connections may or may not occur within the RSA. In the instance of Ten Mile RSA, only two parcels are covered by the Deer Creek Water Association. Please note this Study did not determine which parcels are already actively served by the above water systems. As a result of this uncertainty of where the available connections will occur within or outside

each RSA, for water budget purposes it is assumed that each new development unit would utilize 500 gpd, the limit set for new domestic exempt wells in the 2020 Nooksack Instream Flow Rule amendment (Ecology, *Nooksack Amendment*).

As noted in each of the maps, at this time, there are insufficient connections with small water systems to serve all potential development units within these RSAs. Further, there is no guarantee that any available connection would be provided within the RSAs, as the water system service areas overlap the RSA and areas outside the RSA area. If that PADU is exercised, if they cannot be served by a water system, these uses would default to a rural exempt well capped at 500 gpd for an individual and 3,000 gpd for a new Group B water system.

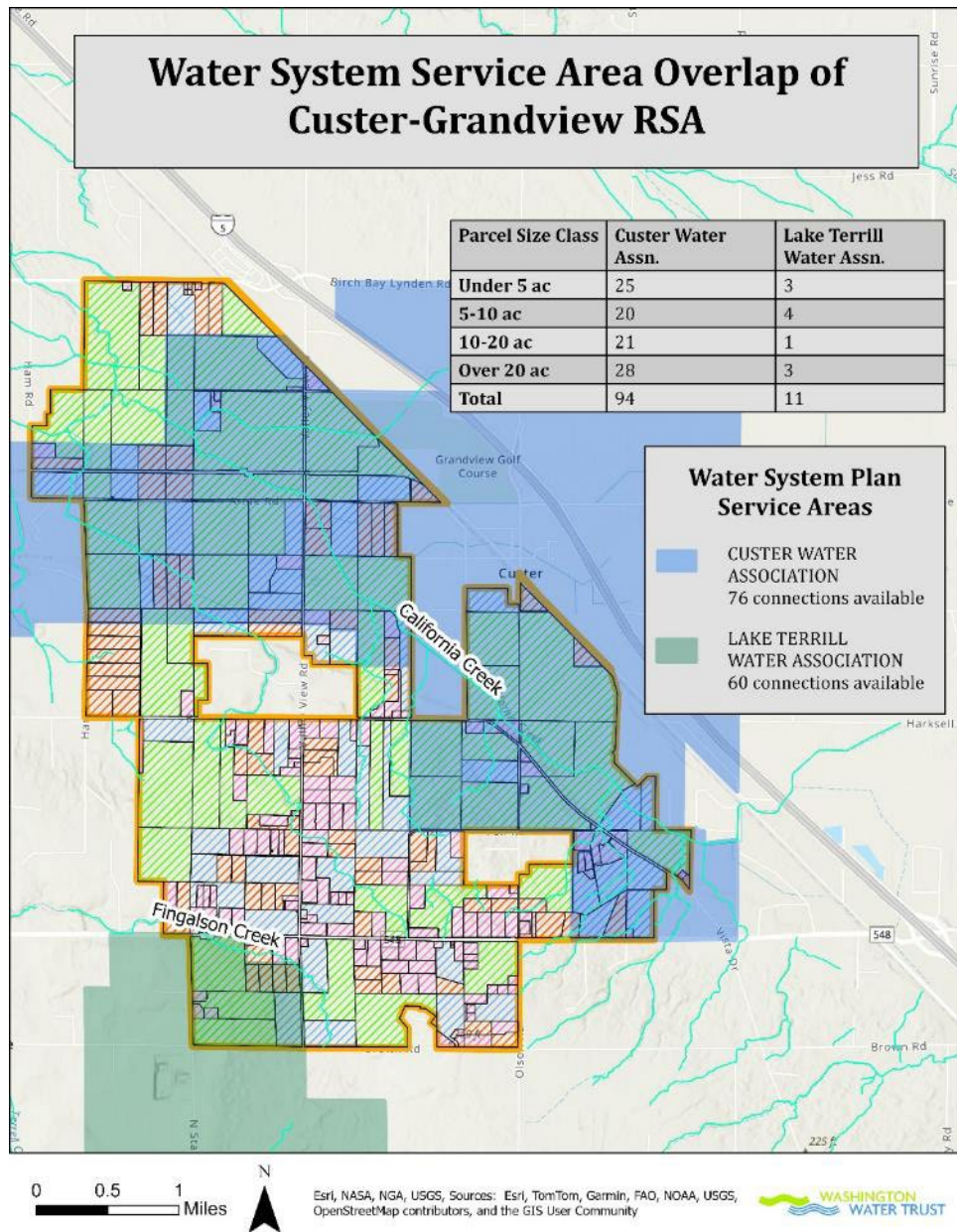
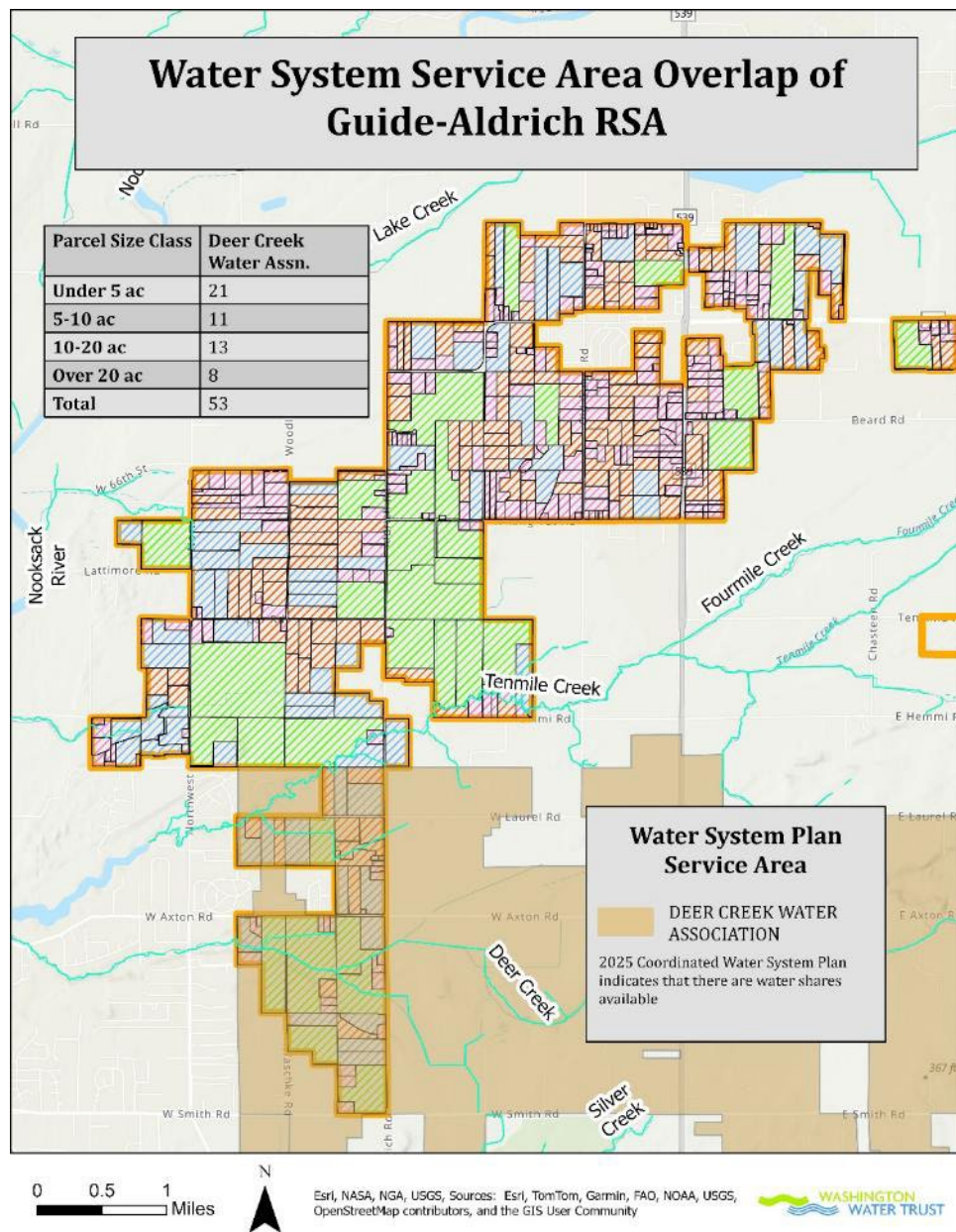


Figure 1 Map displays RSA area, parcel size class, number of parcels that are within water system service area which overlaps RSA. Being within service area is not guarantee of parcel being supplied by that water system.



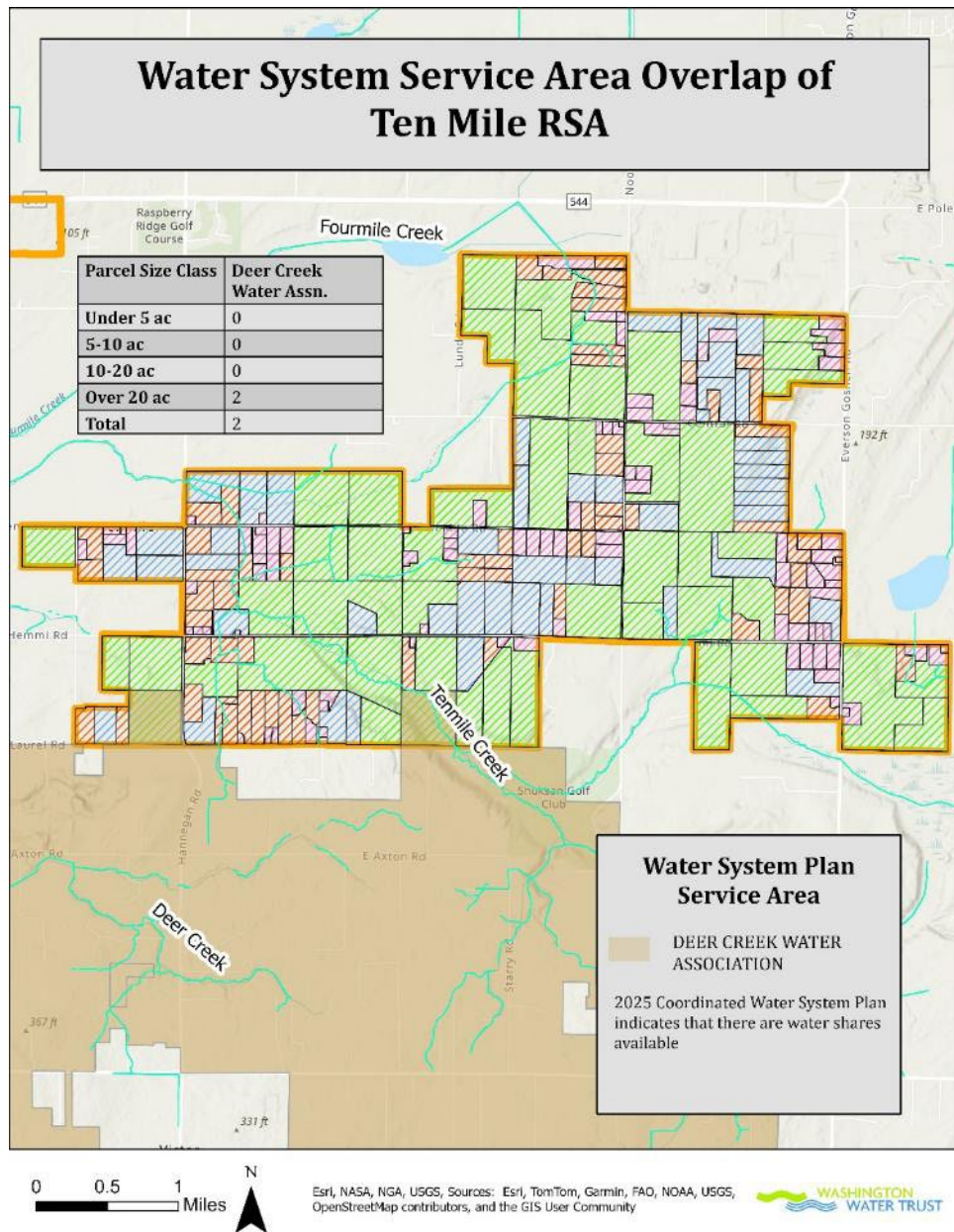


Figure 3 Map displays RSA area, parcel size class, number of parcels that are within water system service area which overlaps RSA. Being within service area is not guarantee of parcel being supplied by that water system.

PUD No.1

WWT worked with Chris Heimgartner, the General Manager of Whatcom PUD No.1, to gather data layers and information on water system piping near the RSAs, including a shapefile of the general location of the PUD's pipeline. For safety reasons, the shapefile spans a width of 0.2 miles to obscure the exact location of the pipeline. However, this level of detail was adequate for the Study. As seen on the Water Availability Map, the PUD pipeline does not intersect with any of the three RSAs. While not part of this Study, just south of the Custer-Grandview RSA is the Aldergrove RSA, an RSA that does intersect with the PUD line shown on the map. The costs to design and build infrastructure to deliver PUD water to any of the RSAs is unknown and is worth further review.

Exempt Wells

In 2020, resulting from the *Whatcom County v. Hirst* decision Washington Supreme Court decision, the Washington State Legislature passed the Streamflow Restoration Act requiring 15 basins, largely in Western Washington, to adopt watershed plan amendment to address and offset the anticipated rural well development (Ecology, *Hirst*). WRIA 1 stakeholders met to discuss the projected growth of rural wells as well as identify projects to offset the impact of those new uses. While this group was unable to reach consensus on the plan in the prescribed time, Ecology ultimately adopted the amendment under rulemaking in May of 2020.¹⁰ This rule budgeted 500 gallons per day (gpd) for each new domestic well and a new limit of 3,000 gpd (formerly 5,000 gpd) for new group domestic water system, with a limit of irrigation of up to ½ acre for both individual and groups wells. While exempt wells for non-domestic purposes such as stockwater and industrial purposes at 5,000 gpd may still be allowed, the ability to demonstrate that this use will not impair other users or instream flow may make the likelihood to obtain such a well, low. One additional impact to consider is that each additional exempt well will likely require installation of a septic system. The number of exempt wells that were developed and in use prior to the new rule, or the quantity withdrawn from each well is unknown.

Land Use Water Demand

The *Regional Water Supply Plan-Phase 2 Report* has produced water demand estimates by subbasin. Below, the table Domestic Water Demand demonstrates the range of water needed in the event all Potential Development Units were built out and a rural exempt well was installed at 500 gallons per day.

¹⁰ Per Chapter 173-501 WAC

Domestic Water Demand		
PARCEL CLASS SIZE	5 to 10 acre Parcels	Over 10 acre Parcels
Total Potential Development Units	58	612
Water Demand	32.45 afy	342.19 afy

Two previous studies have estimated current and future irrigation consumptive demand, with both citing that this demand will outpace the current legal availability of water.¹¹ Other water demand projections developed for the planning effort that preceded the Nooksack River basin rule amendment provided estimates of future domestic water demand by sub basin. It should be noted that those estimates are based on 20 years of rural well development (2018 – 2038), while the table above assumes the bookend total build out from current development potential. The Department of Ecology, building off of work completed for RH2 in 2018, estimates a water demand of 88.95 acre feet/year for 561 new homes in the Lower Nooksack sub basin (which includes the Guide-Aldrich and Ten Mile RSAs) and 97.37 acre-feet/year for 594 new homes in the Coastal North sub basin (which includes Custer-Grandview RSA) between 2018 and 2038 (Ecology 30).

Below, the table Agricultural Water Demand estimates the water demand if all acreage in the Parcel Size Class, 5-10 acres and Over 10 acres were irrigated with a 75% efficient method,¹² 10% evaporative loss and a range of potential crop types with water demand per crop assumed from the Washington Irrigation Guide (WIG), Bellingham station Crops selected represent those grown in Whatcom County with a range of irrigation water needs. While the WIG does not have a water duty for orchard grass in Whatcom County, after consultation with the Whatcom Conservation District, it was recommended to use the Pasture/Turf water duty.¹³

¹¹ Regional Water Supply Plan – Phase 2 Report, Public Utility District No. 1 of Whatcom County. January 2023. Quantification of Agricultural Irrigation Water Use and Water Rights. Public Utility District No. 1 of Whatcom County. Revised January 2018.

¹² Big Gun irrigation method is estimated at 65% efficiency, wheel line 75% efficient and drip 88% efficient.

¹³ Personal Conservation with Trevor Gearhart, Farm Planner Resource Specialist, Whatcom Conservation District. October 1, 2025

Agriculture Water Demand-Full Water Supply By Crop				
PARCEL CLASS SIZE	CROP	Acre Demand (AFY)	5 to 10 acre Parcels	Over 10 acre Parcels
Total acreage			1881	7177
Water Demand (AFY)	Field Corn	0.8	1504.8	5741.6
Water Demand (AFY)	Pasture/Turf	1.26	2370.06	9043.02
Water Demand (AFY)	Raspberries	1.48	2783.88	10621.96

These demand estimates are intended to provide a range of potential water needs within the subject RSAs.

Climate Change Impact on Water Availability

A compounding factor in water availability is the impact of climate change. The *2021 Climate Change in Whatcom County* report shared important trends in water availability in the face of climate change, with the Nooksack watershed shifting from snow to rain dominant, peak flow occurring earlier, flooding become more frequent and low flows dropping further by 27% in late summer in the 2080s.

Water supply will become further constrained with climate change, making locating new water supplies more challenging and necessitating innovation and adaptation for large consumptive demand. Strategy 6 for Agriculture, the largest consumptive demand in Whatcom County, in the Climate Change Action report is as follows: “Encourage Increases in Research and Development of Drought and Heat-Resistant Agricultural Crops at the state and federal level and Flexible Infrastructure to Support these Crops.” (116). Resilience in the face of climate change will require adaptive tools including alternative farming practices and water demand scenarios.

Agricultural Practices and Water Supply Alternatives

The initial evaluation of both land resources and water supply for the RSAs indicate that additional water would be needed to support potential development and agriculture based on the status quo of current crop and agricultural practices water demand in Whatcom County.

A beneficial use analysis of existing irrigation water rights within each RSA is recommended to best understand the quantities still in use and legally available. In considering alternatives in this Study to providing new water supply to these RSAs, it is likely that these ideas have been contemplated in previous studies and assessments in Whatcom County or otherwise may need additional review.

In the *Land Use Water Demand* section of this study, full agricultural water demand was estimated if all parcels above 5 acres within the subject RSAs were fully cultivated growing field corn, pasture/turf or raspberries, to represent a range of water demands. Since providing a full water supply for those example crops may not be feasible, alternative demand or water need scenarios are presented which represent a portion or percentage of that full water supply (75%, 50%, and 25%) of the same crops. These tables provide different water demand ranges which can generally help quantify how much may be needed to supply RSA agricultural lands. The amount of irrigation water available will inform which crops to grow and how best to use these lands for viable commercial agriculture.

Please see below.

Agriculture Water Demand-75% Water Supply By Crop				
PARCEL CLASS SIZE	CROP	Acre Demand (AFY)	5 to 10 acre Parcels	Over 10 acre Parcels
Total acreage			1881	7177
Water Demand (AFY)	Field Corn	0.8	634.84	4306.2
Water Demand (AFY)	Pasture/Turf	1.26	999.87	6782.27
Water Demand (AFY)	Raspberries	1.48	1174.45	7966.47

Agriculture Water Demand-50% Water Supply By Crop				
PARCEL CLASS SIZE	CROP	Acre Demand (AFY)	5 to 10 acre Parcels	Over 10 acre Parcels
Total acreage			1881	7177
Water Demand (AFY)	Field Corn	0.8	752.4	2870.8
Water Demand (AFY)	Pasture/Turf	1.26	1185.03	4521.51
Water Demand (AFY)	Raspberries	1.48	1391.94	5310.98

Agriculture Water Demand-25% Water Supply By Crop				
PARCEL CLASS SIZE	CROP	Acre Demand (AFY)	5 to 10 acre Parcels	Over 10 acre Parcels
Total acreage			1881	7177
Water Demand (AFY)	Field Corn	0.8	376.20	1435.4
Water Demand (AFY)	Pasture/Turf	1.26	592.52	2260.76
Water Demand (AFY)	Raspberries	1.48	695.97	2655.49

The 2025 Whatcom County Comprehensive Plan update goal 8A-2 states, “*Securing an adequate, sustainable, and legal supply of irrigation water sufficient to support the long-term viability of the local agricultural industry,*” (8-8) As shared in the previous section, in general there is a mismatch between existing legal water -- water rights, water systems capacities -- and conveyance infrastructure to these prime soils and the goal of protecting 100,000 acres of agriculture. Yet, it is useful to note that the Agricultural Resource Lands WAC 365-190-050 designation criteria, for lands of “long-term commercial significance for agriculture”, does not explicitly state the need to identify first the access to or provision of water supply to meet a specified crop or agricultural land use demand. This suggests any change in land use to an Comprehensive Plan designation to Agricultural Resource Land need not be predicated on identifying current legal and physical water supply for these lands.

In assessing water to supply agricultural lands in the RSAs, each alternative discussed has three essential factors:

- Obtain a senior water right;
- May require new infrastructure; and
- Any action should not degrade environmental conditions or diminish instream flows.

The following are potential alternatives for additional water or cultivation practices to R5A and R10A parcels which meet the criteria for Agricultural Lands of Long-Term Commercial Significance.

City of Bellingham Water Right

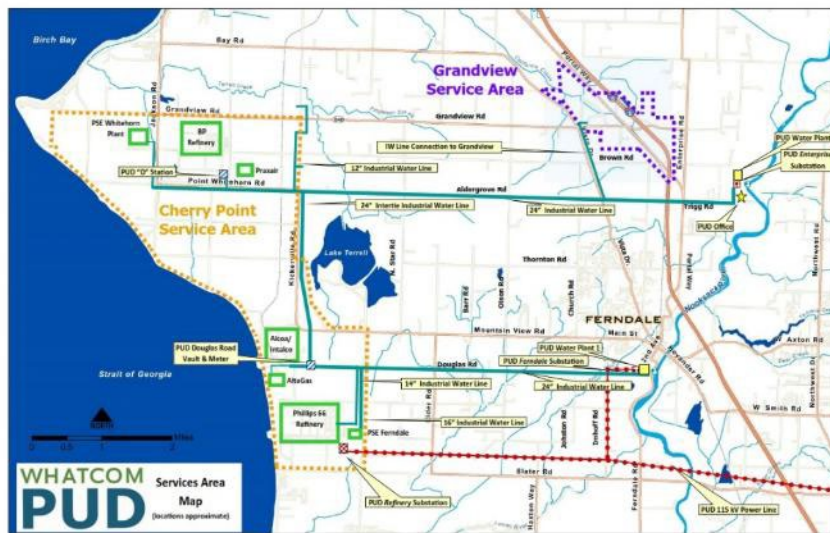
The City of Bellingham (COB) has an authorized diversion on the Middle Fork Nooksack River which is then conveyed via a 40-inch diameter tunnel to Mirror Lake and then to Anderson Creek and Lake Whatcom, to supply domestic and industrial uses in the COB water services area (COB 2-5). Diversion at the Middle Fork is supported by a 1954 priority date water right certificate, S1-00547C, to continuously divert 125 cfs from the Middle Fork Nooksack River. A second certificate, 1508515, is the result of an approved additional purpose of use for S1-00547C to include power generation (COB 6-5). The COB is, “not required to comply with the instream flow requirements on the Middle Fork because City water rights predate the rule. However, the City has voluntarily complied with Ecology’s instream flow rule by limiting times water is diverted. Ecology’s minimum in-stream flow requirements are listed in Table 6.1.” (COB 6-5). The Nooksack Instream Flow Rule lists instream flow measurement at control points cited in WAC 173-501-030. Please note that the instream flow gauge at the Middle Fork, above Clearwater Creek, was discontinued in 2009 due to budget cuts (Ecology, *M.F. Station*).

Table 6.1 Minimum In-Stream Flows for the Middle Fork of the Nooksack River

Period	Minimum In-Stream Flow (cfs/mgd)
August 1 to January 31	275 / 178
February 1 to May 14	380 / 246
May 15 to May 31	450 / 291
June 1 to July 14	575 / 372
July 14 to July 31	400 / 372

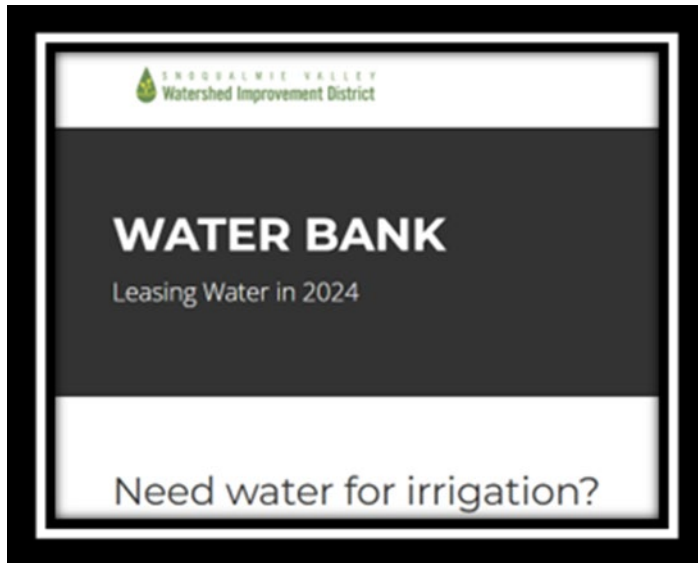
In the event a portion of the City of Bellingham's water right were available, or the City was willing to provide water to users within the RSAs, water could remain in the Middle Fork Nooksack River and be diverted from the mainstem Nooksack River if such use does not deplete instream resources. Water right changes and potentially changes to the City's Water System Plan, as well as diversion and conveyance infrastructure would be needed. Supplementing instream flows with City of Bellingham water rights in the South Fork Nooksack River was cited in the *Regional Water Supply Plan – Phase 2 Report (151)*. Providing a significant agricultural water supply from the City of Bellingham is not noted in their 2025 Water System Plan nor in other assessments, as the City is likely stewarding that supply for long-term needs within its existing service areas. It was outside the SOW to engage the City of Bellingham on their willingness to participate in a potential project or how they utilize Middle Fork Nooksack water to manage Lake Whatcom water supply.

PUD No. 1 water right POD



Whatcom PUD No. 1 has water right capacity and diverts water from two points of diversion on the mainstem Nooksack River near Trigg Road and Douglas Road to supply water to large industrial properties in the Cherry Point industrial area, including both refineries. The PUD water lines also serve approximately 50 irrigation customers (PUD). The infrastructure includes a main line which runs east to west, approximately 1/2 mile from the southern boundary of the Guide-Meridian RSA and 0.17 miles from the southeast boundary of the RSA (Whatcom PUD No.1). The PUD's water right could be used to serve agricultural uses, as it currently serves industrial users and some farms, and their service area is County-wide. Phase 2 of the PUD's Regional Water Supply Plan did not include a beneficial use water rights assessment. Additionally, infrastructure would be required to deliver water from existing PUD pipelines to agricultural water users. Existing ditches, presently used only for drainage, could be used to move water to new customers (see Conveyance section).

Agricultural Water Bank



Water banks are a water reallocation tool to make water available for new uses where no new water is available. An agricultural water bank is a flexible way to seasonally redistribute water among users within a defined place of use (POU) or service area. An RSA or a Watershed Improvement District could serve as the boundaries of an agricultural water bank. Central to this tool is securing senior water right(s) to seed the bank and having the infrastructure to distribute the

water to users.

In WRIA 7, the Snoqualmie Valley Watershed Improvement District (SVWID) was formed on December 7, 2015, with boundaries which generally matched the King County designated Snoqualmie Agricultural Production District (APD) comprised of 14,000 acres along the Snoqualmie Valley between the Snoqualmie Falls and the town of Duvall. APDs were initiated in the 1985 Comp Plan Update to protect the most valuable existing soils and farmlands at risk of conversion.

One of the central organizing goals of SVWID was to identify and purchase water rights to supply agricultural users within the service area¹⁴. In 2016, Ecology provided the partner organization Snoqualmie Valley Preservation Association (SVPA) a grant to identify and acquire an upland water right which could seed the bank. This resulted in the acquisition of a former Weyerhaeuser water right on Tokul Creek, in the amount of 56.71 afy. The SVWID has reportedly acquired a second water right from the former Tall Chief Golf Course in Fall City. Regarding the Tokul Creek water right, the SVWID has conveyed the water down the Creek and in the Snoqualmie River. The SVWID has entered 1–5-year agreements with water users in the valley to provide specific users' water. For the 2026 season, SVWID is offering water leases at \$125/acre-foot to eligible buyers (SVWID, 2026 Lease).

Of principal importance in development of an agricultural water bank is securing senior water right (s) to seed the bank and identifying the infrastructure necessary to distribute the water to users. As previously discussed, two potential water right sources may be the PUD No. 1 or the City of Bellingham, as both rights would be sourced from the Nooksack River, however, conveyance infrastructure would need to be identified.

¹⁴ <https://svwid.com/>

As part of their *Snoqualmie Valley Water Improvement District – Strategic Plan, June 2024*, the SVWID commissioned several storage studies and sought to further evaluate additional farm storage opportunities including the re-purposing of manure lagoons (SVWID, *Strategic Plan*). At the Planning Unit meeting of September 24, 2025, Agriculture Caucus representative Henry Bierlink shared that some small on farm water storage projects are occurring with individual farms. Additional investigation of farm water storage capacity within the RSAs may be warranted.



line running east to west generally along Aldergrove Road to industrial users at Cherry Point, is located roughly within ½ mile of the border of the Custer-Grandview RSA. Although not part of this Study, this PUD main generally bisects the Aldergrove RSA.

As indicated in the Water Systems section of this assessment, two water associations- Guide Meridian Water Assn and Pole Road Water Assn have 12" and 10" mains which run along the Guide-Meridian corridor and are closest to the Guide-Aldrich RSA. Of interest is whether these two associations would have additional pipe capacity within those mains to move water to the Guide-Aldrich RSA.

There is an extensive array of drainage ditches constructed to move water off agricultural properties within and around these northern county RSAs. Although the ditches were developed for another purpose, of interest is whether these ditches or ditch right ways (with pipe placed in them) could be utilized to distribute water within the RSAs. The Canal

and Ditch Route Map shows the approximate location of these ditches. Additional scoping may have already been done in conjunction with the Agricultural Water Board and participating Watershed Improvement Districts to inventory and assess the viability of ditch infrastructure to deliver water to water users.

Reducing Consumptive Uses and Alternative Cultivation Practices

As water demand increases in the Nooksack basin and climate change constrains water availability, integrating water conservation strategies such as irrigation efficiency, water reuse, and alternative agricultural practices will be necessary where water supply is limited, instream flows must be met and there is an interest in maintaining a robust agricultural land base.

Irrigation Efficiency

In Whatcom County, the farming community has pursued irrigation efficiency through the Natural Resources Conservation Services Environmental Quality Incentives Program (EQIP)¹⁵ and the Washington State Conservation Commissions, Irrigation Efficiency Grant Program.¹⁶ Additional strategies to maximize available water efficiently include automated computerized drip irrigation used to deliver water precisely where needed, reducing waste.

Low Water Use Agriculture

With constrained water supplies-both legal and physical, the latter of which may be further constrained by climate change impacts, it will be increasingly important to develop water-resilient cultivation practices which may adapt to changing water supply. Low water use agriculture is an adaptive strategy and management tool that can adjust climate change impacts to water supply and uncertainty surrounding adjudication.

American Farmland Trust (AFT), Washington Water Trust (WWT) and the Dry Farming Institute (DFI) have pursued projects to identify best practices and suitable crops to cultivate without irrigation or to deficit irrigate¹⁷ in Washington. Based on these projects, a variety of sustainable water practices were trialed on participating farms in the Pacific Northwest to assess water resilience. These practices included dry farming techniques, which rely on natural soil moisture without irrigation, and were applied to crops like tomatoes, melons, cucumbers, rye, potatoes, and beans. While these crops were tested in the Pacific Northwest, the specific crops and dry farming best management practices would need to be developed in Whatcom County. Reduced or no-till farming was also showcased to minimize soil disturbance and retain moisture. Farms implemented mulching strategies using materials such as paper and straw to suppress weeds and reduce evaporation.

¹⁵ <https://www.nrcs.usda.gov/programs-initiatives/environmental-quality-incentives-program>

¹⁶ <https://www.scc.wa.gov/programs/irrigation-efficiencies-grant-program-ieg>

¹⁷ A water conservation practice to provide less water than is typical for crop demand while still achieving productivity

Soil moisture monitoring was supported through the use of Watermark sensors and handheld readers, helping farmers make informed irrigation decisions. Some farms featured rainwater catchment systems to collect and store water for use during dry periods. Intercropping—planting complementary crops together—was used to enhance water efficiency and soil health. The application of biochar improved soil water retention capacity, while contouring and terracing helped manage runoff and increase infiltration.

Permaculture or regenerative practices - a combination of sustainable agricultural practices- were explored to design self-sustaining agricultural ecosystems. Washington's Tilth Alliance has established the Coalition for Organic and Regenerative Agriculture (CORA), with farmers to identify best practices and promote their adaptation.¹⁸ A number of these practices have been adapted at scale in eastern Washington 6,000 acres of Royal Family Farms, including no-till, extended crop rotation and onsite wastewater cleaning and reuse.¹⁹

Additional methods included cover cropping to protect and enrich soil, and fungal applications to improve soil structure and moisture retention. These practices collectively aimed to build resilience against drought and optimize water use in agricultural settings.

WWT partnered with Walla Walla company Mainstem Malt in a program called Sprouting Streamflows to pursue agreements with farmers to grow a low water requirement malting barley under Salmon Safe best management practices. Participating growers would receive a water payment for reduced water right use, and their crop would be marketed to brewers, bakers and distillers at a premium price. The goal was to ensure revenue streams to enable farms to meet or exceed the farm budget for typical crop production.

Considering changing water supply availability from climate impacts, out of stream demand, the ongoing water rights adjudication, and persistent low flows affecting instream resources, it is crucial to develop, diffuse and adopt a combination of farm irrigation efficiency, viable alternative crops and cultivation practices.

¹⁸ <https://tilthalliance.org/our-work/wa-farming-agriculture/coalition-for-organic-regenerative-agriculture/about-cora/>

¹⁹ <https://www.agweb.com/news/crops/crop-production/washington-grower-shares-how-scale-regenerative-farming>

Alternative Water Supply



Figure 4 Kale grown with recycled water (photo right) vs. Sammamish River water (photo left)

Other opportunities to develop new water supplies do not rely on existing freshwater sources but as referenced in the Regional Water Supply Plan, include desalination or reuse of reclaimed water produced in Blaine and Birch Bay:

"The City of Blaine Lighthouse Point Water Reclamation Facility is permitted to discharge up to 1.54 MGD (2.4 cfs) and during the summer is used for irrigation of the Semiahmoo Resort Golf Course. The Birch Bay Water and Sewer District is permitted to discharge up to 1.44 MGD (2.2 cfs) (located in the Birch Bay Subbasin). Any water that can be reclaimed from these facilities and used to offset or supply a consumptive use, or improve instream flows, will be beneficial." (27).

The treated wastewater (recycled water) produced by these plants is principally

discharged to the Salish Sea and the Regional Water Supply Plan recommends re-use of this water. The water produced at the Birch Bay Water and Sewer treatment plant is located in closest proximity to the Custer-Grandview RSA and could serve as new irrigation water supply. This solution would require infrastructure investments to deliver recycled water to the RSAs, as well as small on-site storage of the water which would allow water to be trucked in and stored for later use. The 2025 Coordinated Water System Plan update refers to a 2015 Water Reclamation and Reuse Study for Whatcom PUD No.1 by Murray Smith and Associates (MSA) which asserted: "what is currently seen as impractical and cost prohibitive, may be a viable solution in the future, thus requiring constant review and fresh perspective of water reclamation and water reuse opportunities." (8-39).²⁰

In order to evaluate the acceptability of using recycled water from both agricultural producers and consumers, Washington Water Trust and King County have been collaborating on a recycled water project in the Sammamish Valley since 2019. The project included the development of pilot gardens growing market vegetables -carrots and kale- over two years (2020-2021) with both recycled water in some sample plots and river water

²⁰ Original source noted, but could not be found and is cited here as from 2025 WSP update

in other plots, as well as simultaneous public outreach including consumer focus groups. Outreach results showed consumers were overwhelmingly supportive of the use of recycled water for irrigation of food crops.

The pilot gardens served to help evaluate water demand, nutrient inputs, and the potential human health risks of consuming food irrigated with recycled water. Intertox, a toxicology consulting firm, conducted a risk assessment using data from the pilot garden and relevant literature. Their analysis found that, even under the most conservative assumptions, the exposure from eating carrots and kale grown with recycled water was approximately 0.18 nanograms per kilogram of body weight per day. For comparison, typical daily exposure from other sources—such as household dust and treated carpet—was significantly higher, at 5.9 ng/kg/day and 35 ng/kg/day, respectively.

For more than 20 years, wastewater facilities in Washington have produced Class A recycled water that can be used for food crop irrigation.²¹ However, recycled water use for crop irrigation in Washington remains limited compared to other regions of the United States, including California, which irrigates upwards of 12,000 acres of food crops annually with recycled water (Cahn et al., 2016). Reclaimed water can be used for irrigation while fully complying with USDA and Oregon Tilth organic certification standards, provided the recycled water purveyor meets regulatory water quality standards. It is important to evaluate the market acceptability of selling this produce related to food safety questions.

As with other water supplies to these RSAs, infrastructure and funding to support that buildout would be needed to deliver recycled water from the Blaine and Birch Bay facilities to the closest RSAs, Custer-Grandview and Loomis Trail (this RSA was not part of this Study). Recycled water from existing facilities is one of the tools to address water availability and will not provide the full water demand. Decentralized wastewater treatment systems have been discussed, but they may be limited by the volume produced and their ability to support commercially viable agriculture.

Desalination could be another option to produce new water for agricultural water supply. While substantial studies on the efficacy, viability and cost of desalination in Whatcom County are unknown, the Regional Water Supply Study (January 2023), identified that the “estimated cost of desalinated water is \$5 per 1,000 gallons to produce. Lynden charges approximately \$1.75 per 1,000 gallons of water” (152).

²¹ Per WAC 173-219-390

Summary and Recommendations

This Land and Water Study (Study) was initiated by the WRIA 1 Planning Unit following recommendations to Whatcom County Council in 2024 to better integrate water and land use planning in the development of the 2025 Comprehensive Plan update. The Study was informed by the 2025 Agricultural Lands Assessment and past Rural Land Studies. The Study evaluated R5A and R10A zoned lands within three Rural Study Areas (RSA) - Custer-Grandview, Guide-Aldrich, and Ten Mile - to identify the potential of the R5A and R10A lands within the subject RSAs being able to contribute to the 1997 Comprehensive Plan farmland preservation goal of 100,000 acres. The evaluation of these lands included water availability, parcel development potential, water supply potential and alternative agricultural practices.

Water Availability

The Water Availability section of this Study sought to identify existing or future water availability which could serve the water demands of agriculture or development. Three critical features in this review and future delivery of water for these purposes include: valid water rights, infrastructure to deliver water, and additional or unutilized yet authorized connections from group water systems. The ongoing WRIA 1 (Nooksack) Adjudication will ultimately provide certainty regarding valid water uses, valid water rights, protection of instream flow through a comprehensive decree and final determination of water rights by a Whatcom County Superior Court judge, but that may be decades away.

All water rights with irrigation as a purpose of use and a place of use (POU) which overlapped the subject RSAs were mapped. A beneficial use water rights assessment would be necessary to better understand which irrigation water rights are wholly or partially intact and those which may have been relinquished. The Guide-Aldrich RSA had the largest number of irrigation water rights but was also the RSA which has experienced the most parcel fragmentation. This Guide-Aldrich RSA is a cautionary tale of what happens when prime agricultural lands with strong water right claims are zoned R5. Over time, residential development leads to parcelization and the fragmentation of larger agricultural parcels, leading to the relinquishment of these water rights and the loss of these farmlands.

Another potential water supply source may be existing group water systems with service areas which overlap the RSAs. Nine water systems appear to overlap the RSAs but have no connections available, while three others - Custer Water Association (Custer-Grandview RSA), Lake Terrill Water Association (Custer-Grandview RSA), and Deer Creek Water Association (Custer-Grandview RSA, Ten Mile RSA) hold upwards of 130 available connections. As the service areas of these systems overlap with non-RSA lands, it is unknown where these available connections may be ultimately serving domestic need in

the RSAs or outside. The capacity of the existing systems to deliver irrigation water is not fully understood.

PUD No. 1 maintains significant water right capacity, and a water system service area which includes the entirety of the county and does serve some existing agricultural water users. While the existing pipeline does not cross any of the three RSAs, it does intersect with the Aldergrove RSA. For domestic needs that may be unmet by available water system connections, new development would develop exempt wells based on the 500 gallons per day limit established under the Nooksack River basin rule amendment.

Climate change will exacerbate water resource challenges, shifting the form of water availability from snow dominant to rain dominant, with more water earlier in the season and less in late season, increased flooding, and lower low flows. In consideration of the potential water needs, water demand estimates of both domestic and agricultural water demands were developed. While domestic demand may be largely met by either available water system connections or likely rural wells, the scale of water which may be needed to grow the crops most prevalent in Whatcom County is not currently available and will require consideration of alternative water supplies and alternative agricultural practices. As the service areas of these systems overlap with non-RSA lands, it is unknown where these available connections may be ultimately serving domestic need in the RSAs or outside. The capacity of the existing systems to deliver irrigation water is not fully understood.

Agricultural Production and Water Supply Alternatives

The Land and Water sections of this study identify the scale of large tracts of land that remain, the development potential within the three RSAs as well as the current water supply that may be available to support new uses. The water demand estimates for both domestic and agricultural crop demand, as well as the Comprehensive Plan Update Goal 8A, indicate additional water supply is needed to provide viable long term commercial agricultural land use within the County. Additional water supply to meet agricultural water demand which matches current agricultural land uses and water demands will prove challenging given available water rights, the infrastructure investments necessary, and state of instream flows which are persistently low and anticipated to be lower in late season from climate change impacts.

Among the largest water rights which divert from the Nooksack River are the City of Bellingham and PUD No. 1, which could potentially serve downstream river users in the RSAs. These water rights would require both the willingness of the water right owners as well as additional infrastructure to deliver water to the RSAs. This new use under existing water rights would reduce flows in the Nooksack River.

An Agricultural Water Bank like that used by the Snoqualmie Valley WID would provide administrative flexibility to distribute water to participating users but would need an existing senior water right and the infrastructure to deliver that water. The Snoqualmie WID utilizes the Snoqualmie River for conveyance to farms along the river with river diversions. Considering that additional infrastructure would be needed to distribute water from a Water Bank, it would be helpful to engage further evaluation of the existing drainage ditch system and the associated rights of ways held by the WIDs as to their capacity to not only to move water off the fields in the wet season but to distribute available water during the irrigation season.

Other alternative water supplies which have been and may deserve further examination include reclaimed water and desalination. Reclaimed water has proven a reliable water supply to other agricultural water needs in water scarce regions of the country and world. An important consideration is the location of the reclaimed water production plants relative to the location of new uses including agricultural lands.

As cited earlier, the Agricultural Resource Lands WAC 365-190-050 designation criteria, for lands of “long-term commercial significance for agriculture”, does not explicitly state the need to identify first the access to or provision of water supply to meet a specified crop or agricultural land use demand. This suggests that designating Agricultural Resource Land need not be predicated on identifying legal or physical water supply to these lands.

Based on constrained water supplies both legal and physical, integrating water conservation strategies such as irrigation efficiency, water reuse, and alternative agricultural practices will be necessary where water supply is limited, instream flows must be met and there is an interest in maintaining a robust agricultural land base. Further development of dry and low water demand-high value crop farming and regenerative farming practices is important to identify best practices that may prove most viable in Whatcom County. Recycled or reclaimed water is a possible source of irrigation water currently produced in Blaine and Birch Bay, with consideration of proximity to RSAs and needed delivery infrastructure. While this quotation cited earlier relates to the use of recycled water, it may be suited to also initiate innovation with both water supply and alternative farming practices: “...what is currently seen as impractical and cost prohibitive, may be a viable solution in the future, thus requiring constant review and fresh perspective...” (p. 8-39).

Considerations

At the outset of this Study, a central goal was to understand how the parcels that comprise these RSAs may help Whatcom County reach the goal of protecting and supporting 100,000 acres of prime agricultural land as cited in the 1997 Comprehensive Plan and affirmed in Whatcom County resolution 2009-0401. The three subject RSAs comprise 5,367 acres with Custer-Grandview and Ten Mile having on average 75% of their parcels of 10 acres or greater while Guide-Aldrich has 55.7%. Guide-Aldrich had the most identified irrigation water rights but experienced the most development parcelization.

Further investigation of water supply and alternative agricultural practices should continue and will require a range of new funding and partnerships. With any consideration of land use modifications or additional water supply, it is important that these environmental features are not diminished. The experience of Guide-Aldrich may prove instructive on how the opportunity to reach the 100,000-acre goal with the acreage of RSAs is vulnerable to the ongoing development of parcels with prime agricultural soils as well and irrigation water rights.

As noted, the designation criteria for agricultural resource lands does not require identifying a water source for such designation. Therefore, designating high-priority ARLs now will maintain large, contiguous parcels, which helps contribute to the county's long-standing 100,000-acre goal. In other words, re-designating land today keeps options open in the future and provides time to bring water rights solutions (legal and physical) online. Further, it might be advisable that water rights and physical water availability are expressly omitted from decision making regarding the zoning and designation of land, since each of these can be modified with new infrastructure coming online or a water bank providing legal access to water (e.g., water rights).

Whatcom County will experience significant water shortages in the years ahead, especially as climate impacts lead to hotter and drier summers and lower snowpack in the mountains. This challenge presents an opportunity to develop a range of resilient agricultural practices adapted to hotter temperatures and lower levels of water availability. By promoting innovative land use planning and supporting water solutions, Whatcom County can help make agriculture more resilient to future climate impacts and ensure these farmlands stay productive in perpetuity.

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- Whatcom County Environmental NHD flowline
- Combined Potential DU from the 2025 ALA Report data layer
- PUD #1 Routes
- Whatcom County Wetlands
- RSA Boundaries
- SWIFD Categories for Chinook and Coho distribution
- Whatcom County Property- Public Tax Parcels