

Clallam Conservation District 2020 RESOURCE INVENTORY



October 2020

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GENERAL INFORMATION

Clallam Conservation District comprises the same territory as Clallam County, consisting of 1,738 square miles along the northern portion of the Olympic Peninsula. It borders Jefferson County on the south and east, and Canada to the north in the middle of the Strait of Juan de Fuca. Clallam County occupies the former territory of several Native American tribes. Federally recognized Native American tribes with treaty-recognized usual and accustomed territory include the Port Gamble S’Klallam, Jamestown S’Klallam, Lower Elwha Kallam, Makah, and Quileute. All but the Port Gamble S’Klallam Tribe have reservation and/or trust lands in current-day Clallam County. The first white settlers began staking land claims around 1851.

The county enjoys extremes in climatic and ecological diversity with over 7,000 feet of elevation change from the highest peaks to sea level. The county is bounded on two sides by marine water with the Pacific Ocean to the west and Strait of Juan de Fuca to the north. The Olympic Mountain range is positioned inland, creating an obstruction to the westerly winds coming off the ocean. This results in extremely high precipitation in the western portion of the county, where Forks is located, and unusually low precipitation in the Olympic rain shadow in the northeast where Sequim is located. Forks and the surrounding area receives an annual average of over ten feet of rainfall, contributing to some of the only temperate rainforest in the contiguous 48 states. Sequim and the surrounding area receives about 15 inches of annual precipitation. Cape Alava, near the northwest corner of the county is the westernmost point in the contiguous 48 states. Dungeness Spit is the longest natural sand spit in the country.

Clallam County Demographics

Port Angeles, Sequim and Forks are the only incorporated cities in Clallam County. The demographic data provided here were taken from online US census reports (<https://data.census.gov/cedsci/all?q=clallam%20county%20wa>). The population of Clallam County was estimated to be 77,331 in 2019, with approximately 59% of the population living in unincorporated areas (see Figure 1 below). The population experienced an increase of 6.3 percent (5,935) since 2010, with almost all the growth in the eastern third of the county. The median age is 50.5, and 29.6 percent of Clallam County residents are over 65, nearly double the state average of 15.4 percent. Whites make up 87.2 percent of the population, compared to 78.9 percent for the state. Only 26.1 percent of Clallam County residents hold post-secondary degrees, compared to 35.3 percent statewide.

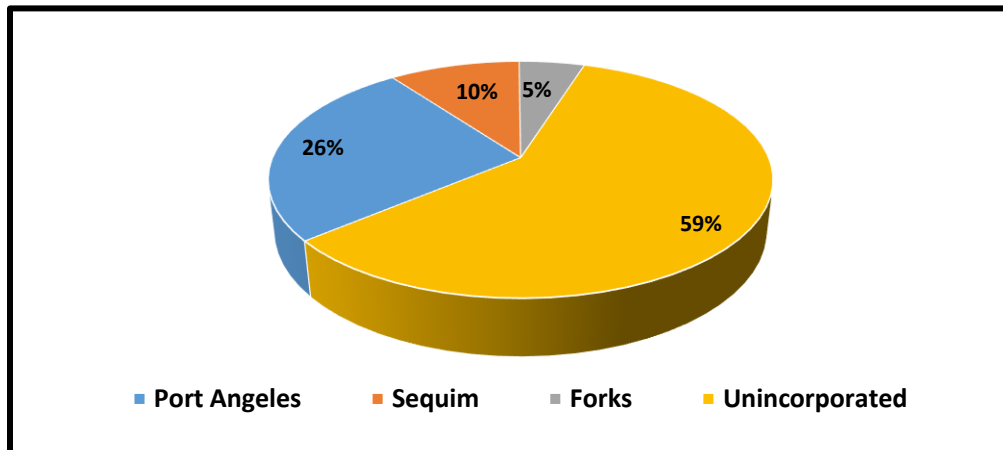


Figure 1. Clallam County Population Distribution





Figure 2. Map of Clallam County

Table 1. Land Areas and Population Distribution in Clallam County

Unit	Square Miles	Population	% of Population
Total County	1,762.00	77,331	
Port Angeles + UGA	18.18	20,229	26%
Sequim + UGA	8.24	7,640	10%
Forks + UGA	7.70	3,968	5%
Unincorporated + Other UGAs	1,727.88	45,494	59%

Land Ownership in Clallam County

Public land makes up approximately 61% of Clallam County. Federal lands total nearly half the acreage of the county.

Table 2. Land Ownership in Clallam County

Ownership	Acres
Federal Land	523,496
Olympic National Park	318,093
Olympic National Forest	199,209
Other Federal Land	6,194
State Land	160,377
State Forest Board and DNR Lands	154,530
State Parks	2,488
Other	3,359
County and Local Governments	7,350
Total County Land	3,817
County Parks	643
Port of Port Angeles	858
School Districts	344
Other (cities and special districts)	2,331
Private Lands	437,602

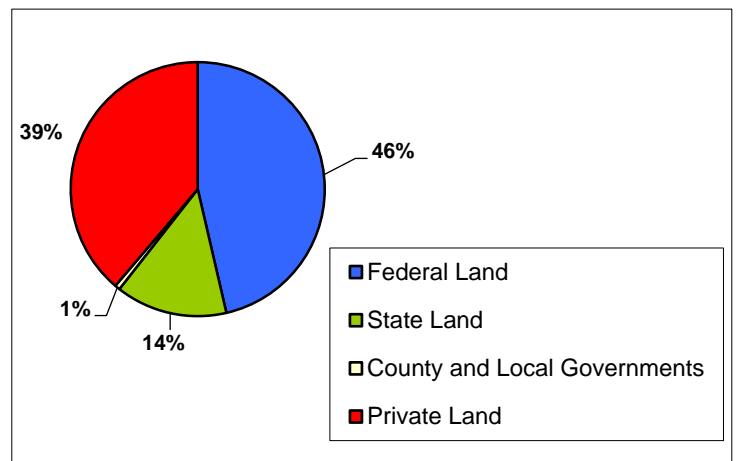


Figure 3. Land Ownership in Clallam County



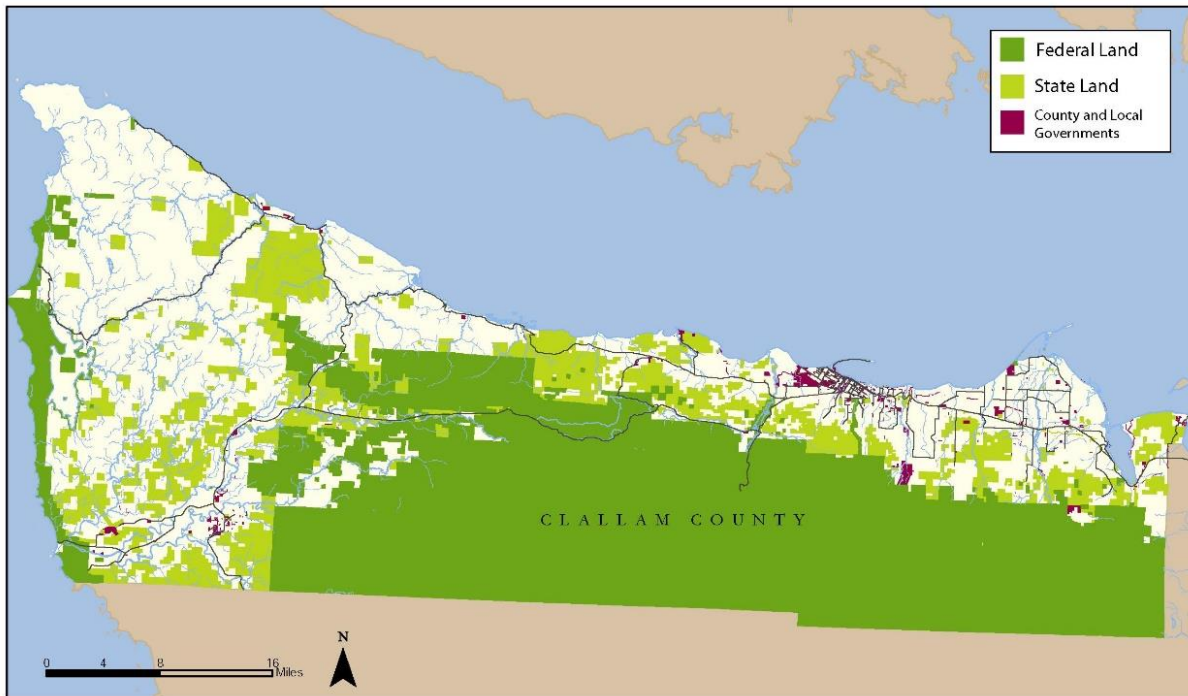


Figure 4. Map of Public Lands in Clallam County

AGRICULTURE IN CLALLAM COUNTY

Agriculture has a long history in Clallam County, dating back to when the first settlers arrived in the late 1800s. Most commercial agriculture has been centered around Sequim and the Dungeness River, the source of essential irrigation water for the area. Dairy farming has historically been the main type of agriculture, and during the 1950s, there were over 500 dairy farms in the county. Most of these dairies were in the Dungeness Valley where per cow milk production was among the highest in the nation. Today only two dairy farms remain in operation in Clallam County.

According to the USDA Census of Agriculture (https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Washington/), the number of farms in Clallam County in 2017 was 528, a one percent decrease from 2012. The total acreage of farmland in 2017 was reported to be 17,197, down 27 percent from 2012, and the average farm size decreased by 26 percent to 33 acres. Over half (52%) of the farms were less than ten acres and 84 percent were less than 50 acres. Over half (54%) of farms reported annual farm sales of less than \$2,500. Nearly half (49%) of farmers reporting were between the ages of 35 and 64, while just

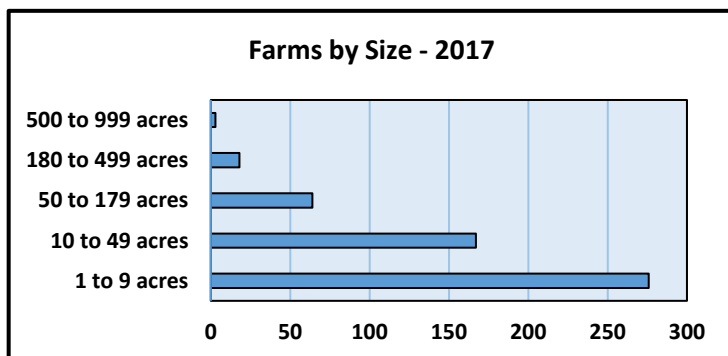
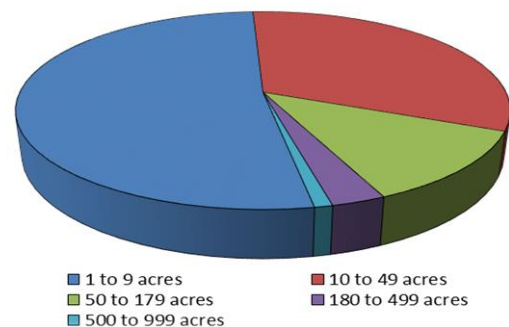


Figure 5. Farms by Size - 2017

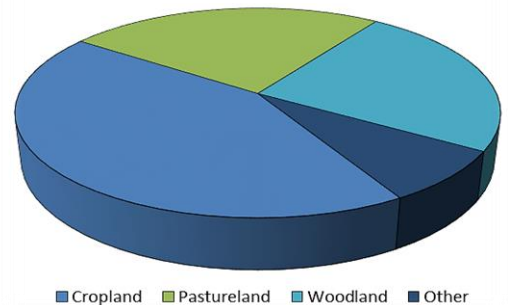


five percent were under 35 and 46 percent were 65 or older. Sixteen percent of farms reported no access to the internet.

A total of 112 farms reported in 2017 that all their income was from farm related sources. Twenty percent of all farms reported selling directly to consumers. Clallam County ranked 31st out of 39 Washington counties for total value of agricultural products sold. The top ranked commodities in the 2017 report were:

1. Cultivated Christmas trees, short rotation woody crops (12th)
2. Aquaculture (15th)
3. Vegetables (16th)
4. Milk from cows (17th)

Figure 6. Agricultural Land Use



Clallam County continues to experience conversion of farmland to residential use. Larger commercial farms tend to get replaced by smaller non-commercial farms – primarily horse operations. Small horse farms account for the majority of the farm technical assistance and conservation plans the Conservation District has produced in recent years.

A total of 32,961 acres of prime farmland and 250,455 acres of farmland of statewide importance are mapped in the *Soil Survey for Clallam County Area, Washington* (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>). The map below shows the location of these farmland soils. The majority of these acres is in the western portion of the county; however, due to high precipitation and the remoteness of the area, very little commercial agriculture occurs there. Most of these lands are in commercial forestry.

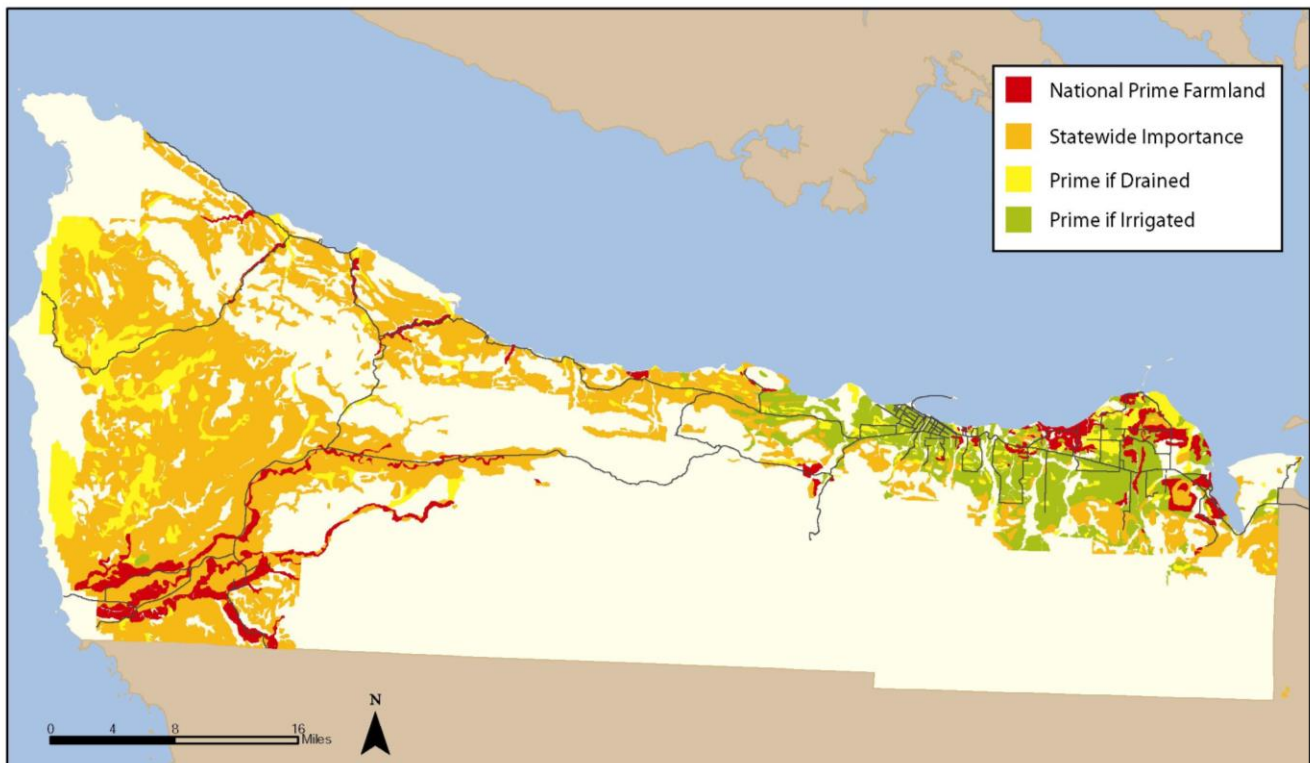


Figure 7. Map of Prime Farmland in Clallam County



Most commercial agriculture occurs in the Dungeness Valley where roughly 5,000 acres of farmland is irrigated. The vast majority of this farmland is supplied with irrigation water from the Dungeness River through an irrigation water delivery system operated by four irrigation districts and three private irrigation companies (one company includes three original water right holders). In the 1990s the seven entities organized themselves under the Dungeness Agricultural Water Users Association.

Agricultural Assistance

The most recent comprehensive inventory of farms in Clallam County was conducted in 2006. A farm inventory update was performed in the spring of 2020 for a portion of the Sequim Bay-Dungeness Watershed Clean Water District. The primary purpose of the inventory was to assess potential agricultural impacts to water quality. Aerial photographs and GIS data were analyzed to identify farm locations and the presence of water bodies. During the 2006 inventory, this analysis was followed by a field assessment conducted by vehicle from public and some private roads. The inventory included observations of the following:

- horse and livestock access to water bodies,
- pasture condition,
- heavy use areas,
- manure storage.

Farms with horses or livestock with access to water bodies, heavily impacted confinement areas or severely overgrazed pastures, or manure stored near water bodies were given a ranking of medium or high potential to adversely impact water quality. All medium and high ranked farms were classified as high priority for outreach efforts.

In 2006, a total of 1,252 farms were inventoried throughout the county, and 117 were classified as high priority. As of 2012, 39 farms were removed from the high priority list. Of the 78 that remained, 19 were in the Clean Water District, 30 in the Port Angeles area, and 29 were west of the Elwha River. Workshops on land and water management for livestock owners were initially held throughout the county and invitations were mailed to all the high priority farms. High priority farm operators did not respond as well as we had hoped to workshop invitations. Typically, very few high priority farms have participated in workshops; however, high priority farm participation has improved in recent years.

Over the past few years, agricultural outreach and education efforts have focused on the Clean Water District, and more recently, the Pollution Identification & Correction (PIC) focus areas. The charts below show the results of agricultural outreach efforts over the past several years. From 2013 through 2016, the goal was to hold at least ten educational events per year. Due to staffing limitations, the goal was reduced to five annual events beginning in 2017.

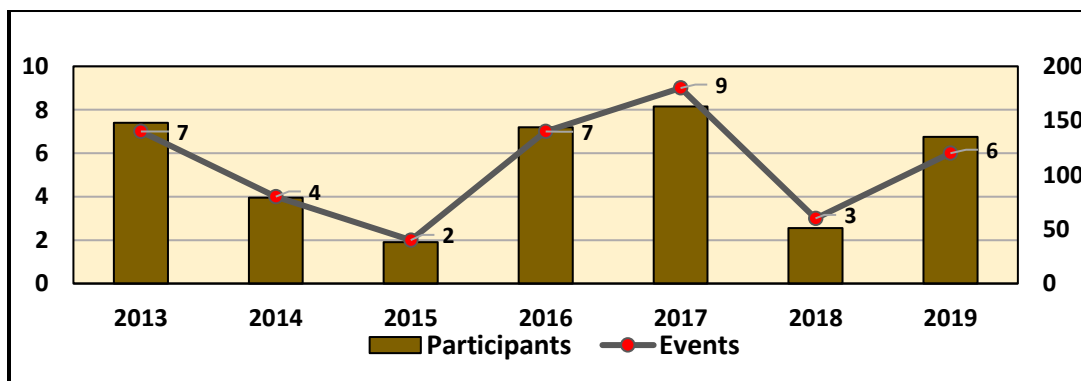


Figure 8. Horse & Livestock Outreach



Technical assistance has traditionally been provided to farm owners and operators, but there has been an increasing trend of assistance to non-agricultural land users in the district over the past couple decades. For the most part, technical assistance is provided upon request and may range from a one-time consultation over the phone or by email to development and implementation of a farm conservation plan.

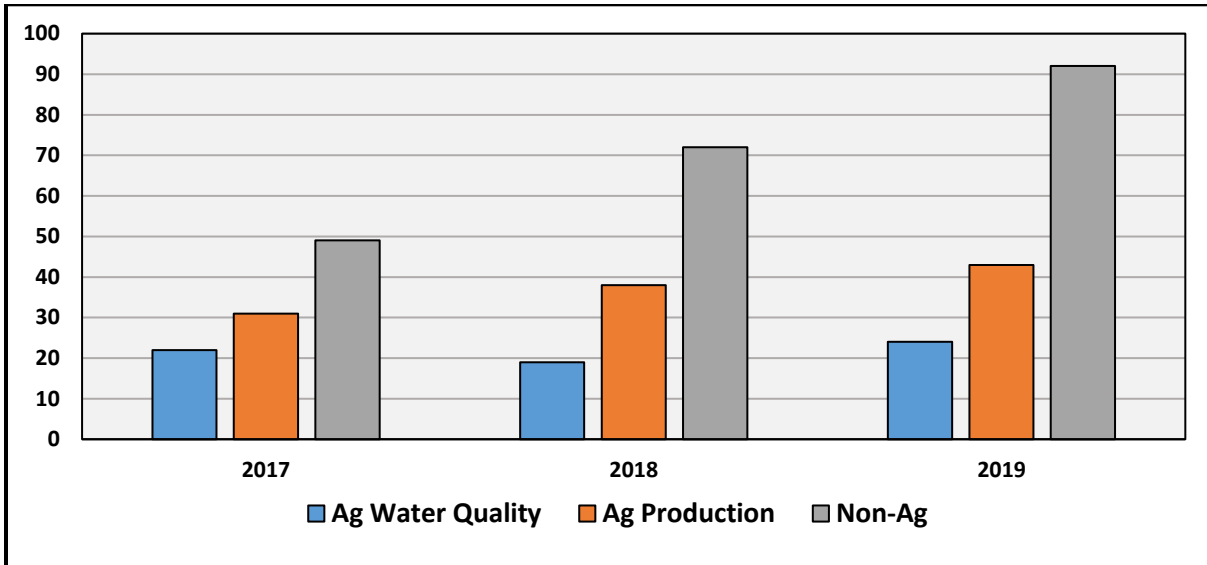


Figure 9. Number of Individuals Served 2017-19

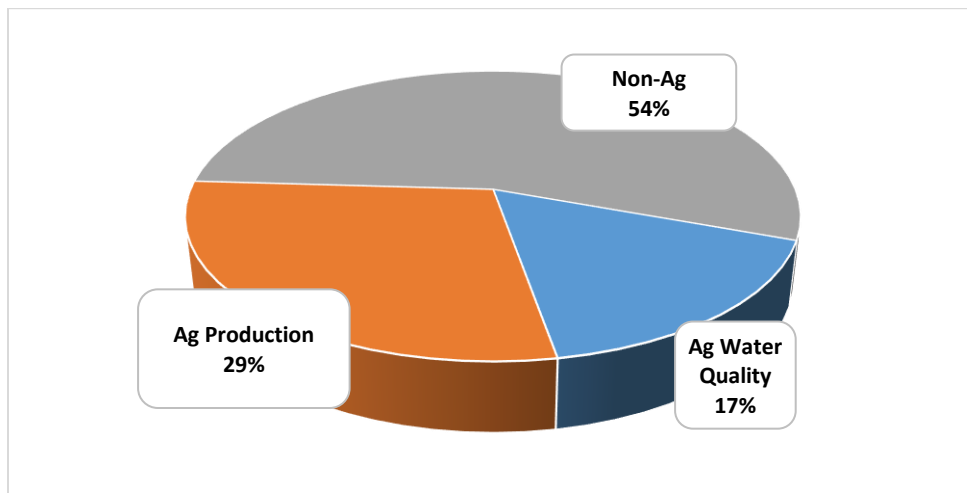


Figure 10. Type of Assistance Provided 2017-19



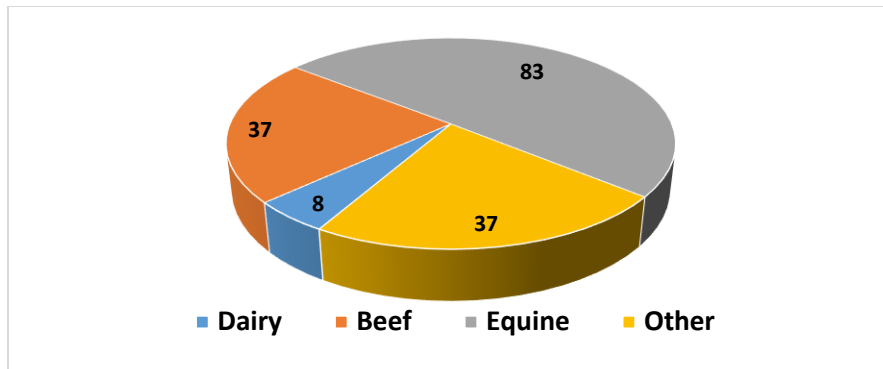


Figure 11. Individuals Assisted by Animal Type 2017-19

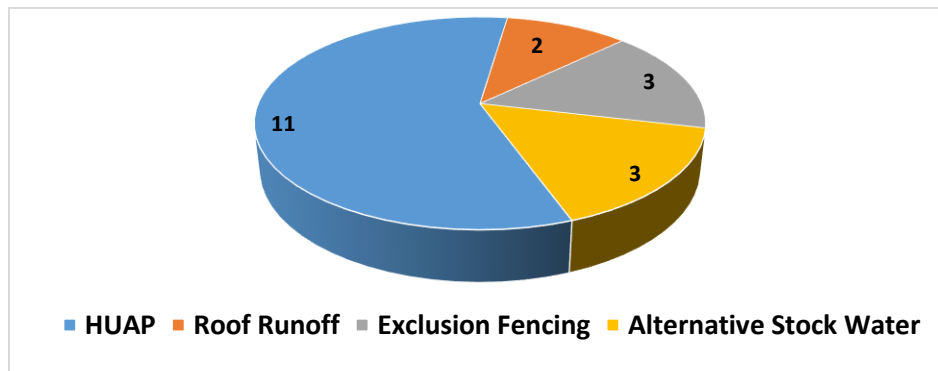


Figure 12. Practices Implemented 2017-19

Agricultural technical assistance efforts in the past focused on water quality protection and improvement, mainly surface water but also ground water, largely because of grant funding. However, that category of assistance actually comprises a small percentage of total assistance provided and has held steady in recent years. And, the type of livestock raised reflects the fact that the vast majority of farms served are hobby farms (Note that this chart shows eight dairies served, but there are only two, plus one dairy heifer operation, thus farms served are counted multiple times). The conservation practices implemented chart also reflects this, as HUAP (heavy use area protection) is mainly implemented for horse keeping. The charts below illustrate the numbers of farmers assisted with water quality concerns, the number of practices implemented, and whether or not the practices benefited surface or ground water. A goal of ten practices implemented annually for each water quality concern category was established for the 2018 long-range plan. Figure 13 shows the numbers of farmers assisted and practices implemented. Note that only structural practices, not management practices such as nutrient management and pasture management, are included.

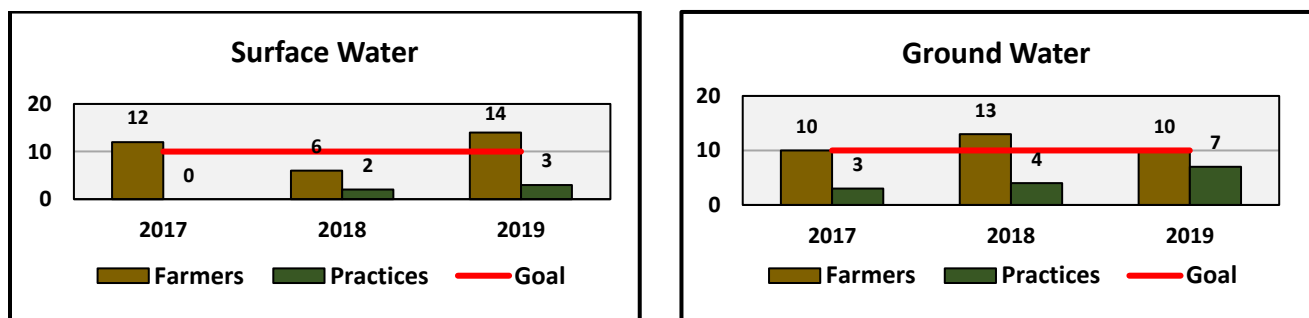


Figure 13. Numbers of Farmers Assisted and Practices Implemented



Over half the technical assistance provided is unrelated to agriculture and includes such topics as garden soil test interpretations, sustainable landscaping, habitat protection and enhancement, environmentally critical areas protection, water availability and the Dungeness Water Rule, septic systems, etc. The demand for this type of assistance has been increasing in recent years. Production assistance is specific to agriculture but focused on management related to such topics as new farm planning, soil fertility and forage production, weed control, and irrigation water management, as opposed to resource concerns like water quality. These charts are based on just the past three years; however, the trend toward less agricultural water quality assistance and more non-agricultural assistance has been underway for many years.

The chart below illustrates the number conservation plans (including comprehensive nutrient management plans for dairies) prepared between 2013 and 2019. Most of these plans have been prepared for farming operations, but in the past two years there have been forestland and habitat focused plans.

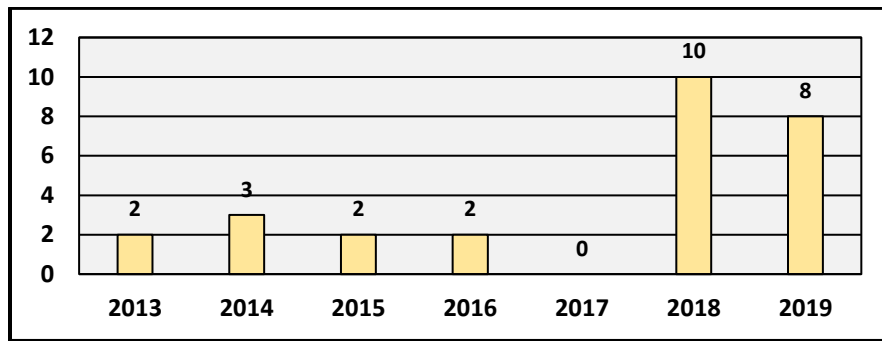


Figure 14. Conservation Plans Prepared

SUSTAINABLE LANDSCAPING

Clallam Conservation District has been promoting sustainable landscaping practices since 1990 through various educational events, including workshops, presentations and a six-session course are offered each spring and fall. Themes addressed include reduced irrigation use, habitat enhancement, stormwater management, wild fire protection, and low maintenance. The vast majority of participants are new residents to the county. Figure 15 shows the number of sustainable landscaping events and participants from 2013 through 2019. Figure 16 is a map of 2010-17 Natural Landscaping course participant properties.

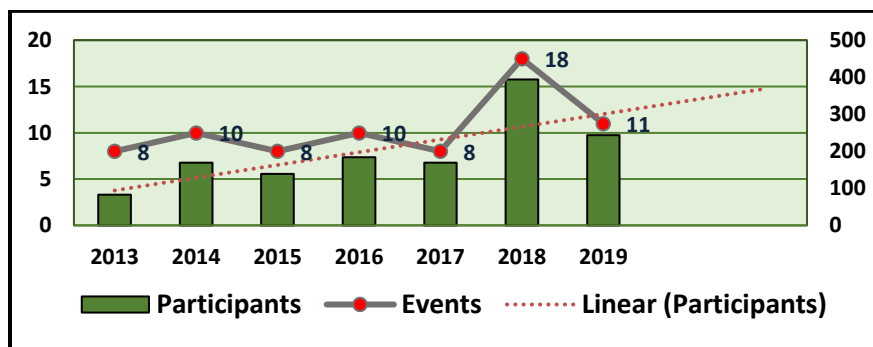


Figure 15. Sustainable Landscaping Education



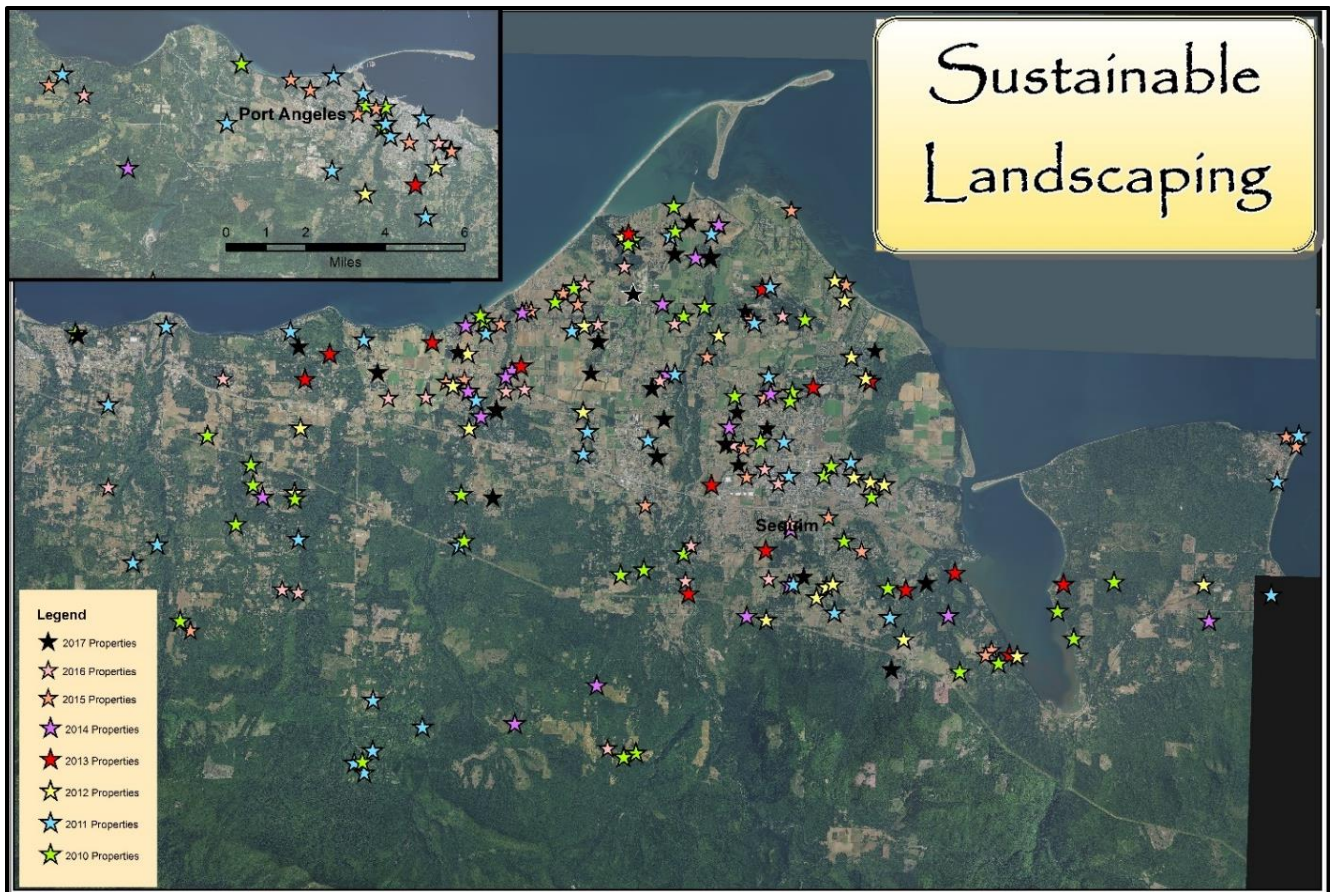


Figure 16. Map of Natural Landscaping Course Participants 2010-17

STORMWATER MANAGEMENT

Due to the rural nature of Clallam County, state and federal standards for stormwater management only apply to the City of Port Angeles and its eastern urban growth area, which is served by sewer. The city is required to comply with a *Western Washington Phase II Municipal Stormwater Permit*. The city has taken great strides to reduce combined sewer and stormwater overflow (CSO) events over the past several years, and offers incentives for installation of rain gardens and other stormwater management practices. Clallam Conservation District was contracted by WSU Extension in 2012 to train Rain Garden Mentors and construct rain gardens in Port Angeles. Unfortunately, due to a prevalence of poorly draining soils and steep terrain, no suitable sites were identified for rain garden construction.

In 2011, Clallam County prepared a *Draft Comprehensive Stormwater Management Plan* (http://www.clallam.net/realestate/assets/applets/Clallam_CSWMP_Draft_for_Public_Review_4_15_11.pdf), as well as a draft public outreach plan and stormwater management brochure. As of 2017, those plans remain in draft form. In 2007, Clallam Conservation District prepared a *Draft Clallam County Small Project Drainage Requirements and Technical Guidance Manual* (<http://www.clallam.net/LandUse/smallprojectdrain.html>) for Clallam County. The manual includes pre-engineered stormwater management practices applicable for rural residential development, intended to lessen the engineering burden for typical residential construction projects throughout the county; however, it remains in draft form and has not been implemented by Clallam County.

FORESTLAND IN CLALLAM COUNTY

Timber production, mainly industrial timber production, is the dominant land use in the County. Widespread timber harvesting in the area began in the 1920s and continued intensively through the 1980s, at which time the rate slowed significantly due in part to the listing of the northern spotted owl and marbled murrelet as threatened species under the Endangered Species Act.

The Forest Practices Act rules were substantially revised following publication of the Forests and Fish Report of 1999. The changes were intended to provide greater protections for federally listed salmon, among other environmental protections associated with the growing and harvesting of timber. Compliance with Forest Practice Act rules provides Endangered Species Act regulatory protection under the 2006 Washington State Forest Practices Habitat Conservation Plan (HCP). The Department of Natural Resources manages over 92,000 acres of timberland under its own HCP.

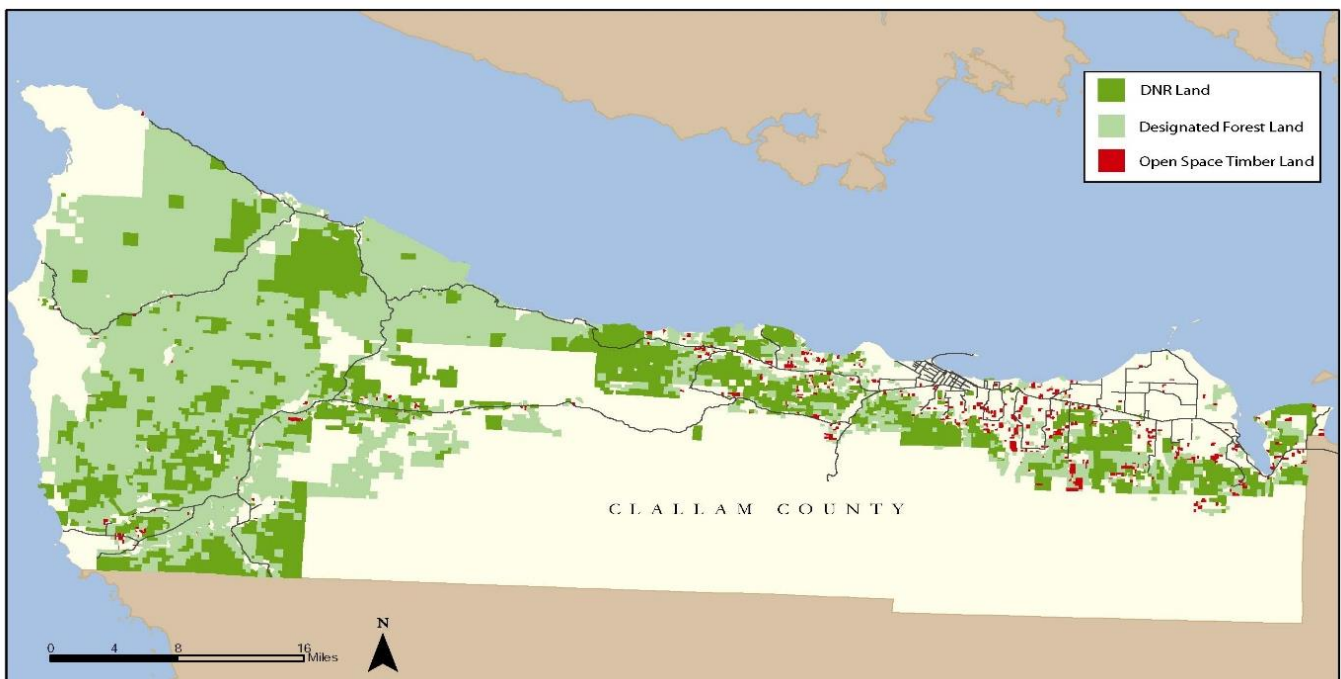


Figure 17. Map of Clallam County State and Private Timberland

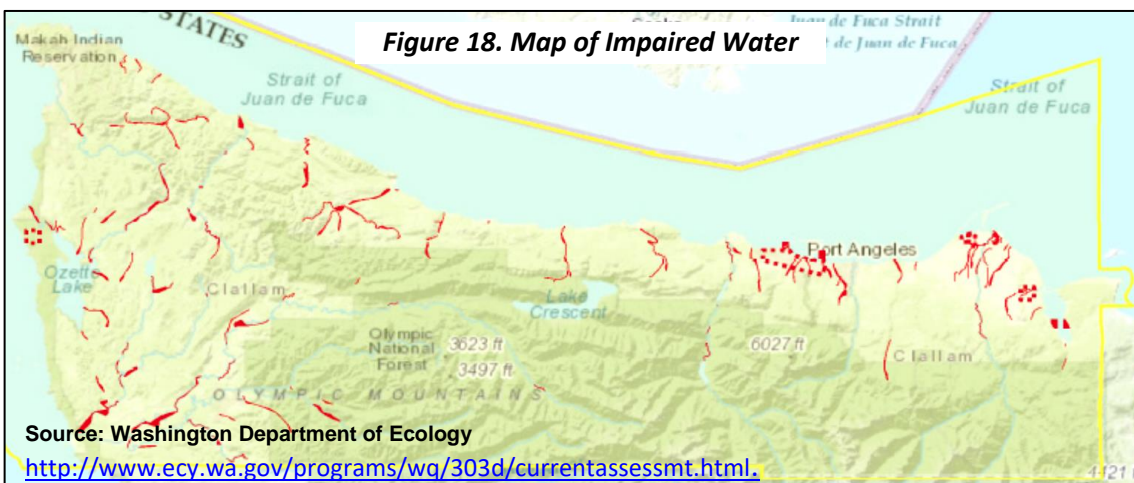
Although timberland is the single largest land use in Clallam County, Clallam Conservation District has not significantly served this audience of land users. This is due in part to the fact that the Forest Practices Act provides fairly prescriptive guidance for timberland management and industrial timberland owners have the necessary expertise to manage their lands in a sustainable manner. Small family forest landowners do have needs; however, the conservation district has not had access to either appropriate funding or expertise to serve this audience. However, we have sponsored fish passage barrier replacement projects through the state Family Forest Fish Passage Program (FFFPP), as well as road decommissioning and upgrade projects on US Forest Service land. Five FFFPP projects have been completed in the past seven years, with the last project was done in 2016.

WATER QUALITY AND IMPAIRED WATER BODIES IN CLALLAM COUNTY

The table and map below show the water bodies on the 2016 Clean Water Act 303(d) list that fail to meet water quality standards for bacteria, temperature and dissolved oxygen. Listings based on data that are greater than ten years old are not included in the table, as such listings may no longer be true. For example, irrigation ditches piped years ago, remain on the 303(d) list even though they no longer exist as waterways.

Table 3. Impaired Water Bodies - 2016

WRIA	Fecal Coliform Bacteria	Temperature	Dissolved Oxygen
17	Jimmycomelately Creek		Jimmycomelately Creek
	Johnson Creek		Sequim Bay
	Sequim Bay		
18	Dungeness Bay	Bell Creek	Bell Creek
	Bell Creek	Cooper Creek	Cassalery Creek
	Cassalery Creek	Golden Sands Slough	Meadowbrook Slough
	Cooper Creek	Meadowbrook Creek	Dungeness River
	Golden Sands Slough	Dungeness River	Matriotti Creek
	Meadowbrook Creek	Peabody Creek	Lotzgesell Creek
	Matriotti Creek	Dry Creek	Siebert Creek (WF)
	Lotzgesell Creek	Elwha River	Lees Creek
	Owl Creek		Dry Creek
	Agnew Creek		
	Siebert Creek		
	Morse Creek		
	Lees Creek		
	Peabody Creek		
	Ennis Creek		
	White Creek		
	Valley Creek		
	Tumwater Creek		
	Port Angeles Harbor		
	Dry Creek		
19	Strait of Juan de Fuca (Pysht)	Salt Creek	Salt Creek
		West Twin River	Bear Creek
		Deep Creek	Deep Creek
		Pysht River	
		Sekiu River	
20	Dickey River	Dickey River	Ozette River
	Mill Creek	Lake Creek	Lake Creek
	Bogachiel River	Unnamed trib to Umbrella Creek	Big River
	Elk Creek	Bogachiel River	Grimes Creek
		Unnamed trib to Calawah River	Umbrella Creek
			Sooes River
			Coal Creek
		Elk Creek	



The main water quality parameters not meeting standards in the western portion of the county are water temperature and dissolved oxygen. High water temperature is typically attributed to a lack of shade resulting from riparian vegetation removal. This is commonly associated with past logging practices in which forest was cleared to the water's edge. Current Forest Practices Act rules, which have been in effect for nearly two decades, provide much greater protections for riparian areas. The vast majority of these listings are based on data collected decades ago without recent updates.

Low dissolved oxygen commonly results from high water temperatures, excess nutrients and subsequent algae growth and die-offs. Fecal coliform bacteria are indicators of waste from warm blooded animals and are typically associated with livestock, failing septic systems and wildlife.

CRITICAL AREAS PROTECTION

As required by the Washington State Growth Management Act of 1990, each jurisdiction in Clallam County has adopted policies and regulations to protect environmentally sensitive or critical areas (i.e. wetlands, fish and wildlife habitat conservation areas, critical aquifer recharge areas, frequently flooded areas, and geologically hazardous areas). The Clallam County Critical Areas Code can be found at <http://www.codepublishing.com/WA/ClallamCounty/html/ClallamCounty27/ClallamCounty2712.html#27.12.900>.

Existing and ongoing agriculture may deviate from critical areas protection requirements by enrolling in an alternate program intended to both protect critical areas while conserving agricultural lands. Beginning in 2017, enrollment in the program requires completion of a risk assessment and may require development and implementation of a farm conservation plan. It was anticipated that the conservation district would be looked to for technical assistance for farm conservation plan development; however, no requests have been received to date.

Shoreline Management Program

The Clallam County Board of Commissioners approved an update of the Shoreline Management Program in October 2018 (<http://www.clallam.net/landuse/smp.html>). The updated program consolidates shorelines protection regulations with relevant critical areas protection regulations. It also includes stormwater management policies and regulations that pertain to shorelines.

THREATENED, ENDANGERED AND SPECIES OF CONCERN IN CLALLAM COUNTY

The table below lists the fish and wildlife species listed as endangered, threatened, and sensitive in the state of Washington. The additional notations are for the federally listed species (i.e., FE=endangered, FT=threatened, FC=candidate for listing, and FSC=species of concern). The fish species are federally listed but still on the state candidate list. More information, including a list of species that are candidates for state listing, is available at <https://wdfw.wa.gov/species-habitats/at-risk/listed>. Of the species listed, those generally most susceptible to human activities are the fish. In addition, the marbled murrelet and northern spotted owl are old growth coniferous forest dependent species, thus timber harvesting activities impact their habitat, but rules designed to minimize or avoid habitat impacts are now in place.



Table 4. State Threatened, Endangered and Sensitive Species

ENDANGERED		THREATENED		SENSITIVE	
Mammals		Mammals		Mammals	
Blue Whale	FE	Sea Otter		Gray Whale	FE
Fin Whale	FE	Reptiles & Amphibians		Birds	
Humpback Whale	FE	Green Sea Turtle	FT	Common Loon	
Orca Whale (southern res.)	FE			Fish	
Northern Pacific Right Whale	FE			Pygmy Whitefish	
Sei Whale	FE			Olympic Mudminnow	
Sperm Whale	FE				
Fisher	FC				
Birds					
Marbled Murrelet	FT				
Northern Spotted Owl	FT				
Streaked Horned Lark	FT				
Yellow-Billed Cuckoo	FT				
Short-tailed Albatross	FT				
Tufted Puffin					
Reptiles & Amphibians					
Leatherback Sea Turtle	FE				
Loggerhead Sea Turtle	FE				
Fish*					
Puget Sound Chinook Salmon	FT				
HC Summer Chum Salmon	FT				
Ozette Lake Sockeye Salmon	FT				
Puget Sound Steelhead	FT				
Bull Trout	FT				
Invertebrates					
Taylor's Checkerspot	FE				
Mardon Skipper					
Pinto Abalone					

* These fish species are listed as Candidates for state listing.

Salmon Restoration and Orca Recovery

In 2012, the Elwha Dam located at river mile 4.9 on the Elwha River was removed, which had been a barrier to fish migration since the early 1900s. Two years later the Glines Canyon Dam located at river mile 13 was removed. Now anadromous salmonids have access to nearly 70 miles of habitat that had been inaccessible for nearly a century.

Clallam Conservation District has sponsored several US Forest Service road repair/decommissioning projects, including in the upper Dungeness River watershed, and along Goodman Creek and the Sitkum River in the western part of the county. These projects, funded by salmon recovery grants, have resulted in reduced sedimentation to rivers caused by undersized/blocked culverts and mass wasting events.

Since 2005, Clallam Conservation District has sponsored 18 *Family Forest Fish Passage Program* projects that have opened up many miles of stream habitat. However, the last project was completed in 2016, and just five projects were completed since 2012. Despite this trend, correcting barriers to fish passage remains a resource concern throughout Clallam County.

From 2013 through 2019, 3.36 stream miles benefited from riparian restoration, the vast majority funded through the Conservation Reserve Enhancement Program (CREP). A total of 24 CREP projects have been implemented throughout Clallam County, dating back to the year 2003.



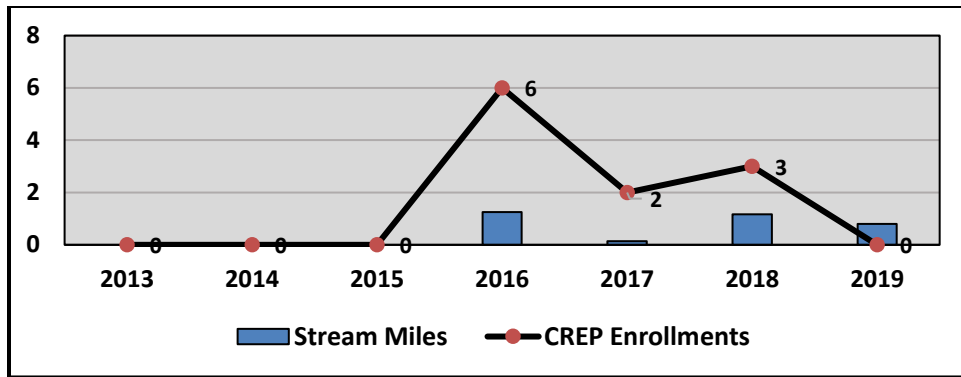


Figure 19. Stream Buffer Restoration

Other Habitat Restoration

Clallam Conservation District has been selling native plants since 1990. The goal of the program is to promote the planting of native trees and shrubs by making them readily available at affordable prices. Plants are bare-root, and in an effort to avoid competing with local nurseries, they are sold in bundles of ten and 25 (conifers only) plants. The plant sale is one of the most popular programs offered by the district, growing in popularity in recent years. The option for credit card payment began in 2018, and in 2019, online sales were initiated. This has likely contributing to the dramatic increase in customers. Total plant sales have increased but at a lesser rate. Figure 20 shows sales from 2013 through 2019.

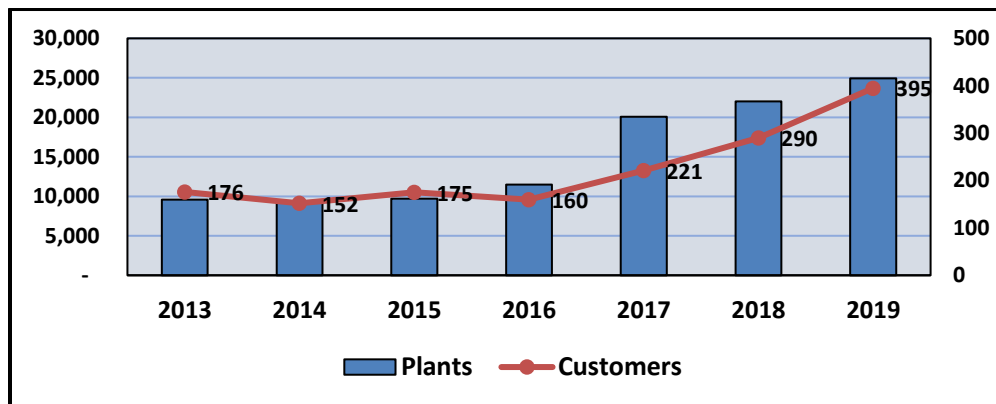


Figure 20. Plant Sales

CLIMATE CHANGE AND SEA LEVEL RISE

In 2015, the North Olympic Resource Conservation and Development Council prepared a Climate Change Preparedness Plan for the North Olympic Peninsula (<http://kaffeld.wixsite.com/noprkd/about2>). In addition, Olympic National Forest and Olympic National Park prepared a climate change adaptation report in 2011 (https://www.fs.fed.us/pnw/pubs/pnw_gtr844.pdf).

The area of Clallam County that has received the most attention for sea level rise, a projected result of climate change, is the Dungeness River Delta. This area from the mouth of the Dungeness River eastward is barely above sea level and has experienced considerable development in the last half century. Sea level is projected to rise anywhere from just under one foot to five feet, with a best estimate of just over two feet by 2100. Washington Sea Grant analyzed parcel-scale flood risk in the Dungeness and Three Crabs area to support efforts to increase the resilience of the area to present and future flood impacts: <https://jamestowntribe.org/natural-resources/habitat/dungeness-river-delta-prioritizing-flood->



[risk/](#). In addition, Clallam Conservation District prepared an assessment of water quality, flooding, fish and wildlife habitat issues for this area in 2009. Included in the assessment were recommended actions, some of which have been implemented, including construction of a new Meadowbrook Creek bridge.

Clallam Conservation District has not had a program focused specifically on climate change and climate change resiliency. However, many ongoing programs and activities do address the critical environmental and economic impacts posed by climate change. The most notable climate change related activities pertain to current and future water supply. Numerous large scale irrigation water conservation and storage projects with irrigation districts and companies have been undertaken over the past couple of decades. And while the primary objective of most of these projects is the immediate habitat benefits that result from reduced irrigation water diversions from the Dungeness River, these projects also provide resiliency for the future when water supplies are likely to be less reliable. Included in these projects is shallow aquifer recharge, which is a form of water storage that can offset groundwater withdrawals and related impacts to surface waters. Larger scale above ground water storage is currently in the design phase for the Dungeness River watershed. Small scale rainwater collection and storage has been promoted throughout the county, as has sustainable landscaping practices that reduce or eliminate the need for irrigation while enhancing biodiversity with native plants. Other activities include the annual native plant sale and riparian restoration work. Each of these programs and activities is discussed in more detail elsewhere in this document.



WATERSHED RESOURCE INVENTORY AREAS

Four Water Resource Inventory Areas (WRIAs) comprise the County, each corresponding to major watershed basins. The WRIAs are the basis for state-mandated watershed planning (Watershed Planning Act of 1998 RCW 90.82). The objectives of watershed planning were to address water resources and water quality issues, including establishing instream flows for salmon habitat. Watershed plans were adopted for WRIAs 18 and 20, but only the eastern half of WRIA 18 carried the planning process through to adoption of a water rule. Much of the information included in this inventory is taken from the watershed planning documents.

The WRIAs in Clallam County include:

- WRIA 17- the Quilcene-Snow watershed
- WRIA 18- the Elwha- Dungeness Watershed
- WRIA 19- the Lyre-Hoko watershed
- WRIA 20- the Soleduck-Hoh watershed

The table below summarizes statistics for each WRIA. Note that these data are from 2012, but population and population distribution data remains relatively unchanged.

WRIA	Total Acres	% County Acres	Population	% County Population
WRIA 17/18	383,508	34.0	58,184	88
WRIA 19	244,723	21.7	2,156	3
WRIA 20	500,561	44.3	6,019	9

Table 5. WRIA Acreage and Population

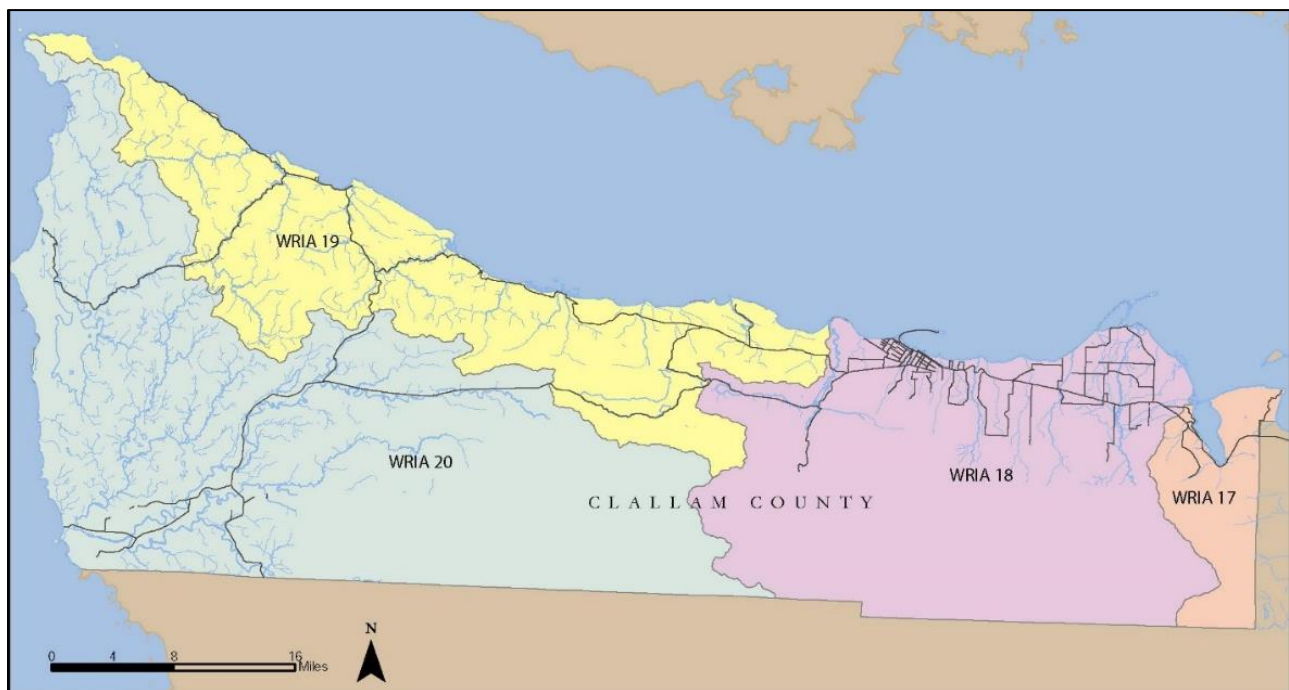


Figure 21. Map of WRIAs in Clallam County

Land Classification by Tax Assessor Information

Many of the rural residential landowners in the County opt to put their acreage into an open space tax relief program. There are three land classifications in the program, Open Space Land, Farm and Agricultural Land, and Timber Land. **The data in the tables below are from 2006, and the Open Space**



Timberland and Designated Timberland classifications have since been combined. While the numbers may have changed slightly, the general proportions remain largely unchanged.

Table 6. Open Space Agriculture Taxed Land by WRIA (2006)

Clallam WRIAs	Open Space Agriculture Landowners	Acres of Open Space Agriculture	Average OS Agriculture size
WRIA 17/18	420	13,528	31
WRIA 19	61	1,916	12
WRIA 20	35	1,776	15
TOTALS	516	17,220	

Table 7. Open Space Timberland (Small Forest Landowners) by WRIA (2006)

Clallam WRIAs	Open Space Timber Landowners	Acres of Open Space Timber	Average OS Timber holding size
WRIA 17/18	355	5,747	16
WRIA 19	120	1,332	13
WRIA 20	74	1,157	16
TOTALS	549	8,236	

Table 8. Designated Timberland by WRIA (2006)

Clallam WRIAs	Designated Timber Landowners	Acres of Designated Timber Land	Average Designated Timber Land size
WRIA 17/18	265	26,819	101
WRIA 19	148	141,174	953
WRIA 20	134	219,245	1636
TOTALS	547	387,238	

The plans developed through the watershed planning process in Clallam County are in various stages of completion, adoption and implementation. The WRIA 18 plan was adopted in 2005 (<http://www.clallam.net/environment/ewhadungenesswria.html>), and a water rule for the eastern half of WRIA 18 (Bell Creek watershed to Bagley-Morse watershed divide) was adopted in January 2013 (<http://www.clallam.net/Permits/WaterRule.html>). The water rule established seasonal instream flows for each of the nine sub-basins in the rule area. It is important to note that until 2012, the nine irrigation districts and companies that currently serve close to 7,000 acres of land had combined water rights from the Dungeness River, adjudicated in 1924, that exceeded 518 cubic feet per second (cfs). At their peak, it is estimated that they delivered irrigation water to approximately 11,000 acres. The 2013 water rule established instream flows for the Dungeness River at 475 cfs for April through July 15 and 180 cfs for July 16 through October 15. In 2012, the irrigation districts and companies were issued superseding water right certificates from the Dungeness River totaling 93.5 cfs.

Water supply and demand is a much different picture in the western half of WRIA 18 compared to the eastern half. The Elwha River is the main river in this area, and its watershed is the largest on the Olympic Peninsula. The western half of WRIA 18 has significantly less water supply and demand conflict. This fact, combined with imminent Elwha River dam removal plans during the watershed planning process resulted in postponement of development of a water rule for the western half of WRIA 18. Elwha River dam removal began in 2011 and three years later the Elwha River was flowing freely.



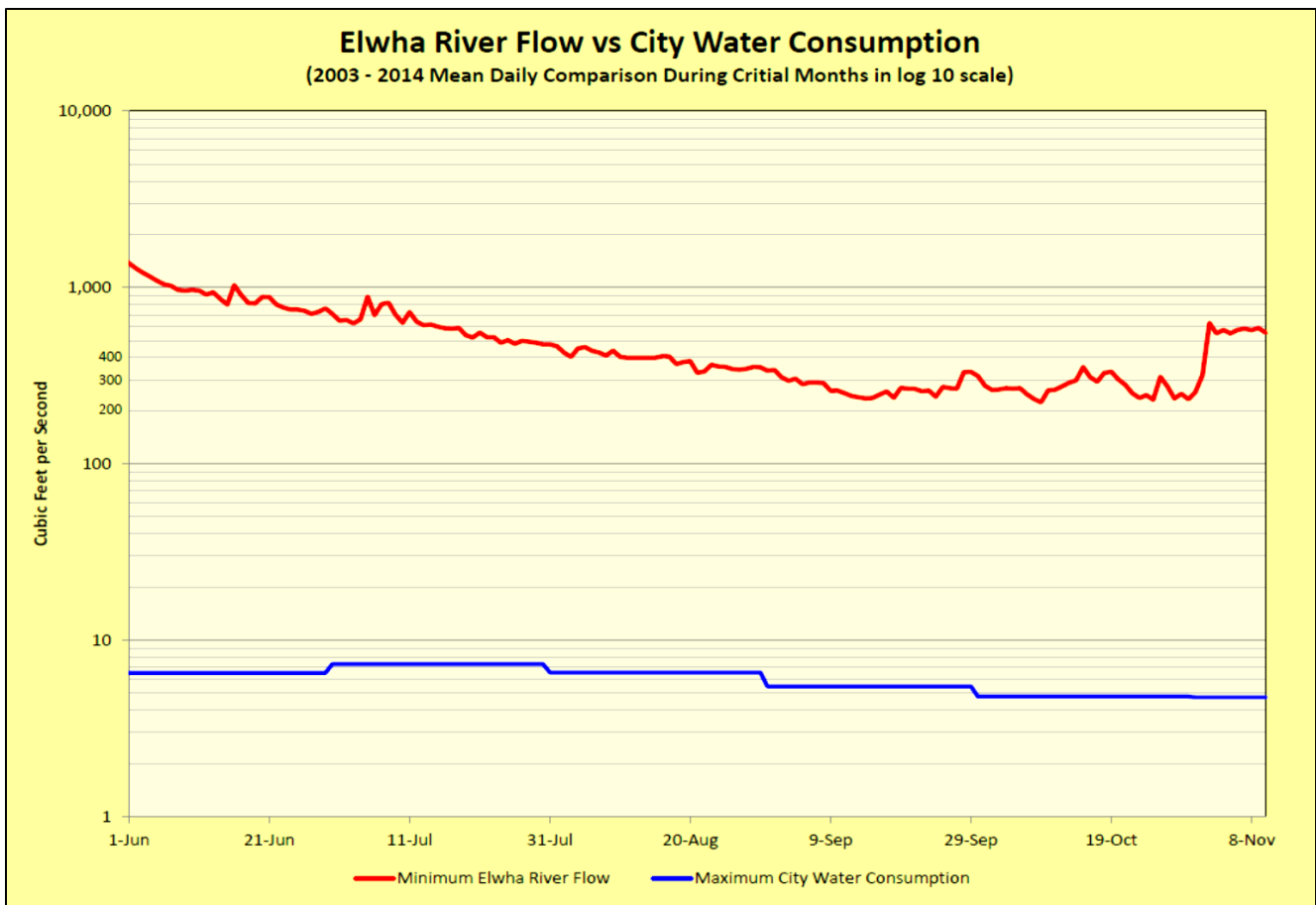


Figure 22. Elwha River Flow & Water Consumption

(Source: City of Port Angeles 2015 Water Shortage Response Plan <https://www.cityofpa.us/265/Water-Utility>)

Low flows in the Elwha River average around 500 cfs in early fall, with the lowest minimum flows between 2003 and 2014 a little above 200 cfs. The City of Port Angeles has a 153 cfs water right from the Elwha for industrial use (50 cfs of which can be used for a hatchery located near the mouth of the river), plus a 50 cfs municipal water right from a 60-foot deep Ranney collector well adjacent to the Elwha (with a backup right to use treated surface water). The City reports that municipal water demand averages about 4.5 cfs, ranging from 3 to 6 cfs. Current Port Angeles industrial demand is about 13 cfs, and it is projected to reduce to about 8.5 cfs after upgrades to the McKinley paper mill are complete. In addition, the City of Port Angeles has 18 million gallons (55 acre-feet) of storage capacity. The City sells some water to the Clallam County Public Utility District #1 (PUD) for consumers east of the City. This water replaces the PUD’s Morse Creek water during low flow periods.

Despite the relative lack of water supply and demand conflicts, the City of Port Angeles does have a five-stage water shortage response plan. Stage 4 of the plan calls for mandatory outdoor restriction (essential water uses only), and stage 5 is water rationing.

A final draft of a WRIA 19 plan was not completed and the planning group has not met for over a decade. The WRIA 20 plan was adopted in 2008. A watershed plan was completed for the Jefferson County portion WRIA 17 but not the Clallam County portion.



STRAIT ECOSYSTEM RECOVERY NETWORK (WRIA 17, 18 & 19)

The Strait Ecosystem Recovery Network (ERN) is the local integrating organization for the Puget Sound Partnership's Action Agenda. Agencies and organizations from throughout the northern portion of Clallam County and eastern Jefferson County comprise the Strait ERN. In 2017, an Ecosystem Protection and Recovery Plan was completed for the ERN (<https://pspwa.app.box.com/s/vs0bhkgi6tivp0fgd2ysuyvm0kudxm1r/folder/32634328646>). The plan outlines the local strategies for Puget Sound recovery. Recovery efforts are focused on salmon recovery, water quality for shellfish, and stormwater management, and includes the following 13 strategies along with recovery goals:

- A. Drift Cell and Shoreline Conservation and Restoration
- B. Estuary Protection and Restoration
- C. Floodplain Conservation and Restoration
- D. Improve Riparian Corridor Management and Instream Habitat
- E. Eliminate Fish Passage Barriers and Excess Sediment
- F. Enhance Native Fish and Shellfish Populations
- G. Implement Local Water Resource Management Programs and Rules
- H. Enhance Ongoing Implementation of Local Shoreline and Land Use Management, Protection, and Incentive Programs and Plans
- I. Implement Climate Change Adaptation and Mitigation Strategies for the North Olympic Peninsula
- J. Implement Local Stormwater Management and Pollution Source Control Programs using a Watershed Management Approach
- K. Enhance Implementation of Water Quality Clean Up Plans
- L. Enhance Support for Oil Spill Preparedness, Prevention, and Response
- M. Enhance Local Communication, Education, Behavior Change, and Public Involvement Programs

In addition to these strategies, the plan identifies 39 data gaps and 52 barriers, including three barriers that apply to all strategies: lack of funding, limited staff capacity, and limited coordination capacity. Insufficient funding is the most commonly listed barrier, followed by a need for political/policy support.

WRIA 17 & 18 DEMOGRAPHICS AND LAND USE DESCRIPTION

Most of the recent population growth in Clallam County has occurred in WRIA 18, in the Sequim and Port Angeles areas. From 1990 to 2000, the population in the eastern portion of the county grew by over 2,500 people and from 2000 to 2010 it increased by nearly 7,500. Population growth has slowed in recent years, but this area of the county continues to experience more growth than elsewhere. Much of the growth in the eastern region has been occurring in unincorporated areas, converting open farmland into low-density residential development.

Port Angeles and Sequim are the population centers in WRIA 18. The estimated population of Port Angeles in 2016 was 19,833. The city covers an area of 10.7 square miles of land. The Sequim population in 2016 was estimated to be 6,964, covering 6.37 square miles; however, the population of the Sequim School District boundaries (eastern county line to Siebert Creek) totaled 29,736. Most of Sequim is within WRIA 18, with a small portion in WRIA 17.

The main water bodies within WRIA 18 are the Elwha River and the Dungeness River. Numerous other independent streams drain to the Strait of Juan de Fuca. Johnson, Jimmycomelately and Chicken Coop



creeks are the main streams in WRIA 17. They all drain to Sequim Bay, which is an important shellfish growing area.

WRIA 17 & 18 Major Natural Resource Issues and Opportunities

Water quality and quantity are major natural resource issues in WRIs 17 and 18, most notably, shellfish harvesting closures in Dungeness Bay due to fecal coliform contamination and low stream flows in the Dungeness River. Puget Sound Chinook, Hood Canal summer chum, Puget Sound steelhead and bull trout, each of which can be found in the Dungeness River, are listed as threatened species.

Water Quality

The Sequim Bay-Dungeness Watershed Clean Water District was established in 2000 following a commercial shellfish harvesting downgraded in Dungeness Bay due to fecal coliform contamination. The Clean Water District includes the area of Clallam County east of the Morse Creek watershed to and including the Sequim Bay watershed. From 2000 to 2003, 1,700 acres of shellfish harvest area in Dungeness Bay were downgraded due to bacterial pollution. Water quality improvements in the bay have resulted in upgrades of 1,424 acres since 2011. The image below shows the 2017 status of shellfish harvesting in Dungeness Bay.

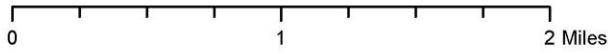
In an attempt to identify the sources of bacterial contamination, two microbial source tracking studies were performed in the lower Dungeness watershed and bay in 2007 and 2008

(<http://www.clallamcd.org/conservation-by-the-bay/?SSScrollPosition=0>). The results represent typical nonpoint source pollution. A total of 34 species or groups were identified in 1,164 analyzed isolates. Frequently identified species included the following with their frequency in parentheses: avian (19.6%), gull (12.5%), waterfowl (9.7%), raccoon (9.2%), unknown (7.3%), human (7.1%), rodent (6.3%) and dog (4.3%). When combined into groups, birds totaled 42% and wild mammals totaled 26% of samples. Domestic sources (dogs and cats) comprised 7.4%. Farm animals (bovine, equine, goats, sheep, llamas, swine, and poultry) comprised 6.9%, with bovine totaling less than 3% and equine less than 2%.

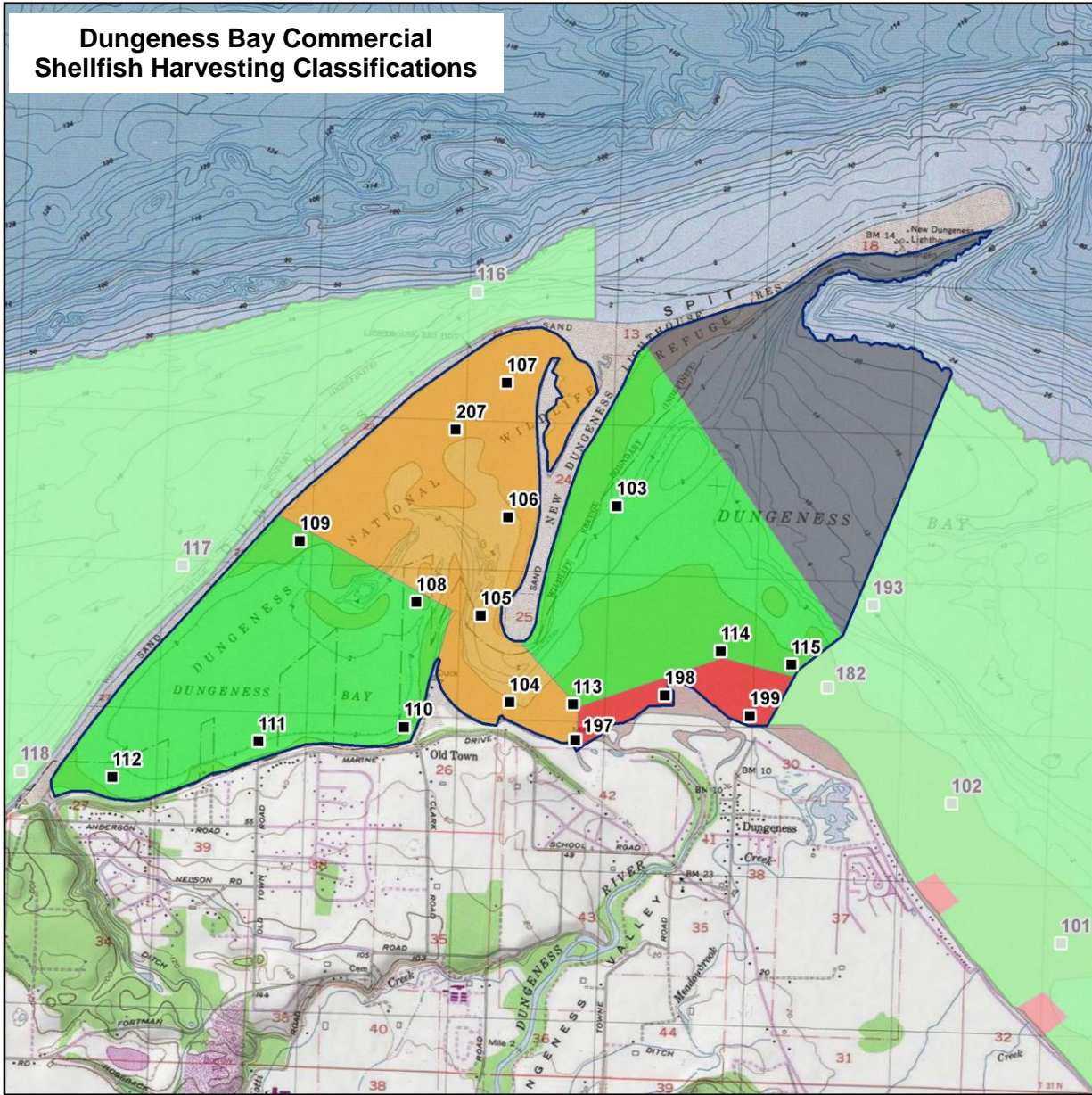
In 2014, Clallam Conservation District led an effort to develop a Pollution Identification & Correction (PIC) Plan (<http://clallamcd.org/conservation-by-the-bay/>). The PIC plan spells out the procedures for strategically identifying and correcting bacterial pollution in the Clallam County Marine Recovery Area (Bagley Creek watershed east to County line). Clallam County Environmental Health Services (EHS) is responsible for leading PIC implementation efforts. They started PIC implementation in 2015 with a pilot project focused on Golden Sands Slough and Meadowbrook Creek and Slough. In 2017, the area was expanded to include the lower Matriotti and Lotzgesell creek watersheds. And in 2020, it is being expanded to include a larger portion of the Matriotti Creek and Mudd Creek watersheds, as well as the lower mile or so of Bell Creek. To date, onsite septic systems have been identified as the primary source of bacterial contamination in the PIC focus areas.

The pilot implementation project was followed up in 2017 by expanding the focus area to include lower Matriotti Creek and Lotzgesell Creek (<http://www.clallam.net/hhs/EnvironmentalHealth/PICProject.html>). Lotzgesell Creek is a tributary to Matriotti Creek, which is a tributary to the Dungeness River.

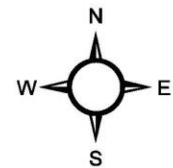




Dungeness Bay Commercial Shellfish Harvesting Classifications



Classification	Sampling Stations
■ Approved	■
■ Conditional	
■ Prohibited	
■ Restricted	
■ Unclassified	



* Some sampling stations are highlighted with grey box for ease of reading.

Figure 23. Map of Dungeness Bay Commercial Shellfish Harvesting Classifications



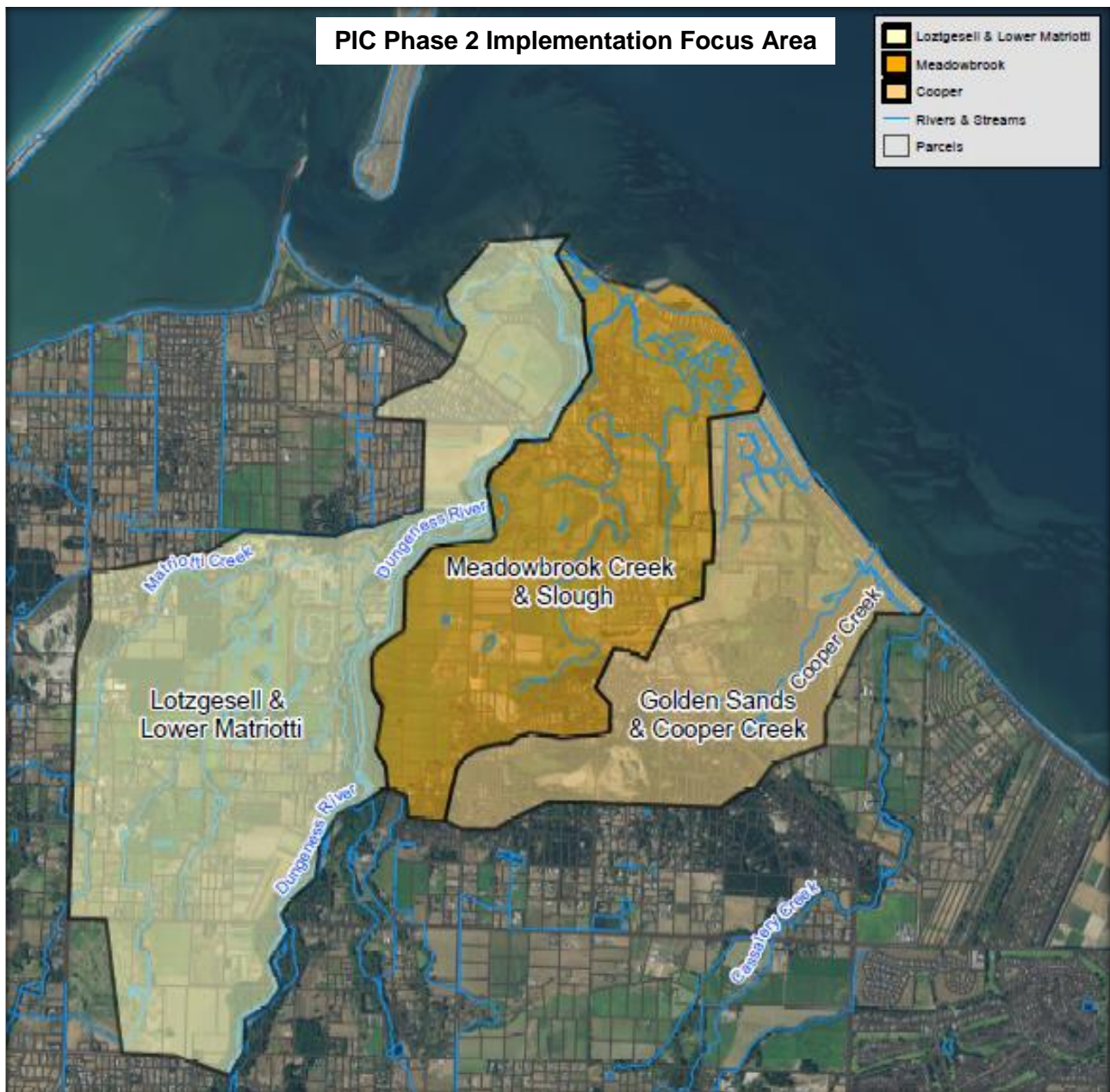


Figure 24. Map of PIC Phase 2 Implementation Focus Areas

The chart below shows the 2015-2016 summary of PIC trends monitoring for all streams in the PIC area. A current chart was not available; however, aside from occasional spikes, trends have held fairly steady on all streams. Water quality trends data are the basis for selection of PIC focus areas, which according to the PIC plan, should be selected annually. However, PIC focus area implementation has not progressed as originally envisioned; therefore, new focus areas have been selected on a biennial basis while continuing implementation activities in previous focus areas.

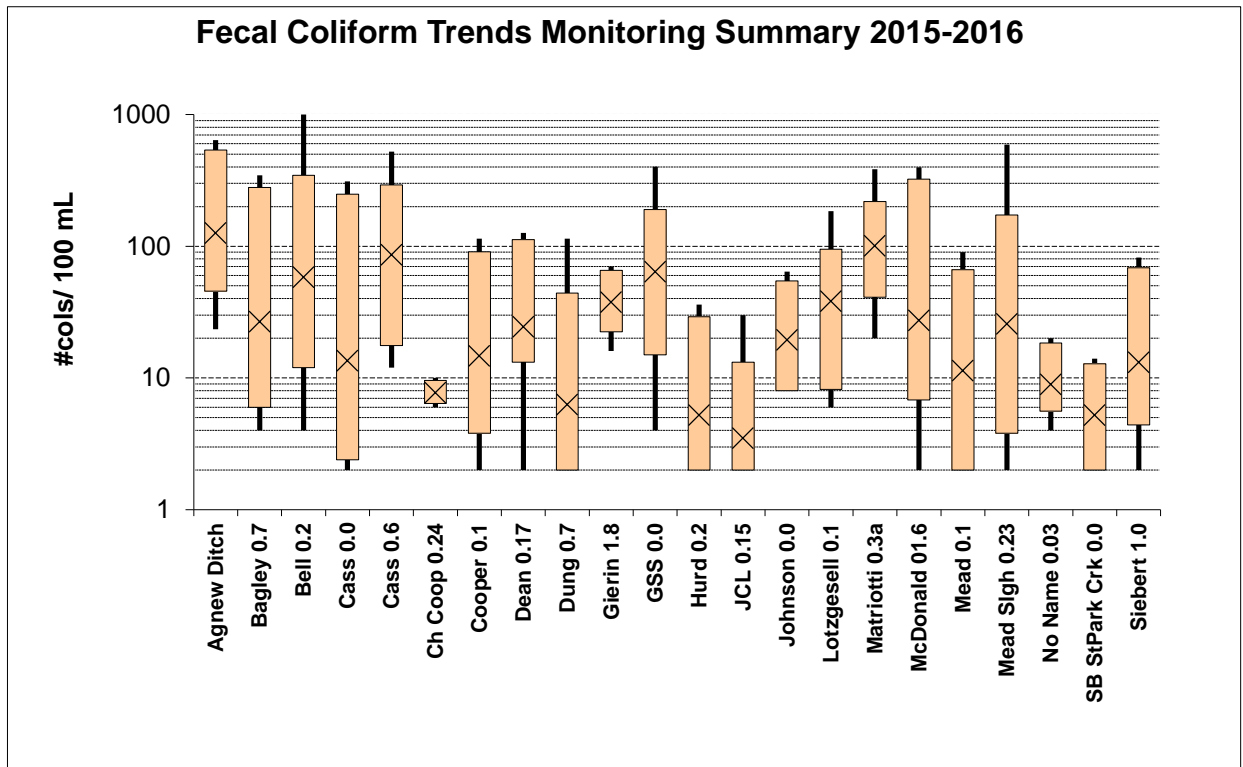


Figure 25. Fecal Coliform Trends Monitoring Summary 2015-16

On-Site Septic System Operation and Maintenance

On-site septic systems (OSS) are potential sources of contamination of both surface and ground water. In 2007, the EHS identified a Marine Recovery Area (MRA) where OSS pose an increased public-health risk to marine waters and developed a plan for finding and repairing all failing OSS within MRA (<http://www.clallam.net/oss/OSSApprovedManagementPlanWithMapsJuly07.pdf>). The MRA plan requires an inspection once every three years for conventional gravity systems and annual inspections for all other systems. Given proper training, system owners are allowed to perform their own inspections. The EHS offers OSS operation and maintenance classes, subject to availability of grant funding. An effort to secure stable funding for the OSS program by charging an \$8 fee per septic system was rejected by the County Commissioners in 2019.

In 2017, the Clallam County EHS reported in their database there are 20,382 on-site septic systems in Clallam County, approximately 60 percent of which are in the MRA. Twenty-nine percent of the MRA systems had current inspection reports on file with the County, 69 percent did not, and two percent are assumed to exist but did not have permits or inspection permits on file. Countywide, 70 percent of the permitted systems did not have current reports on file. The map below shows the MRA area.



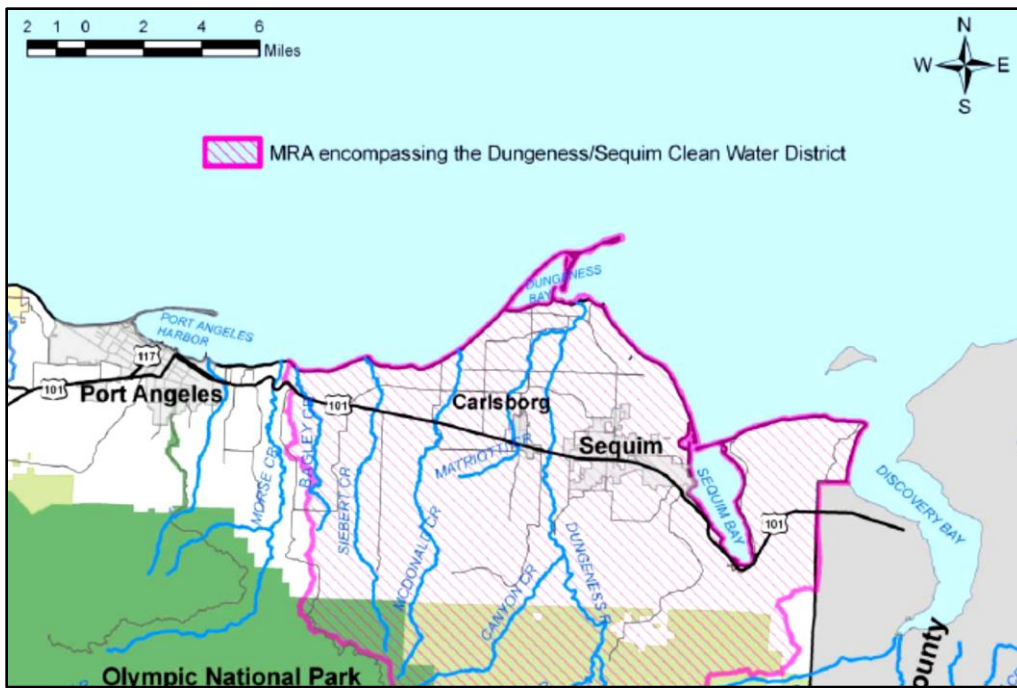


Figure 26. Map of Clallam County Marine Recovery Area.
 Source: Clallam County Environmental Health Services

In 2014, Clallam Conservation District initiated a cost sharing program to repair failing onsite septic systems. The program was designed after the district’s agricultural conservation practices cost sharing program and paid up to 75 percent of the cost of repairing or replacing failing septic system identified as impacting water quality. The grant funding source is targeted at improving water quality for shellfish harvesting; therefore, the focus of the cost sharing program was the MRA. Homeowners within a current PIC focus area are eligible for the program. Homeowners outside a PIC focus area but still within the MRA are eligible if denied a loan. Many applicants pay for their 25 percent share with a loan from Craft3. Through the program’s first six years, 15 septic systems had been repaired/replaced, 12 of which were located near Dungeness Bay.

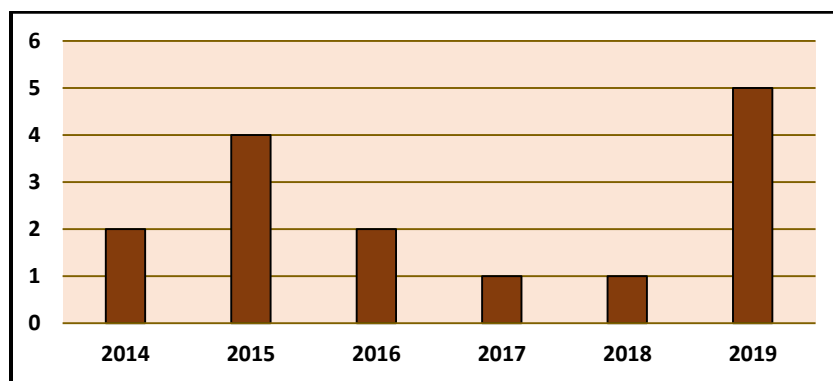


Figure 27. Onsite Septic System Repair Cost-Share Projects

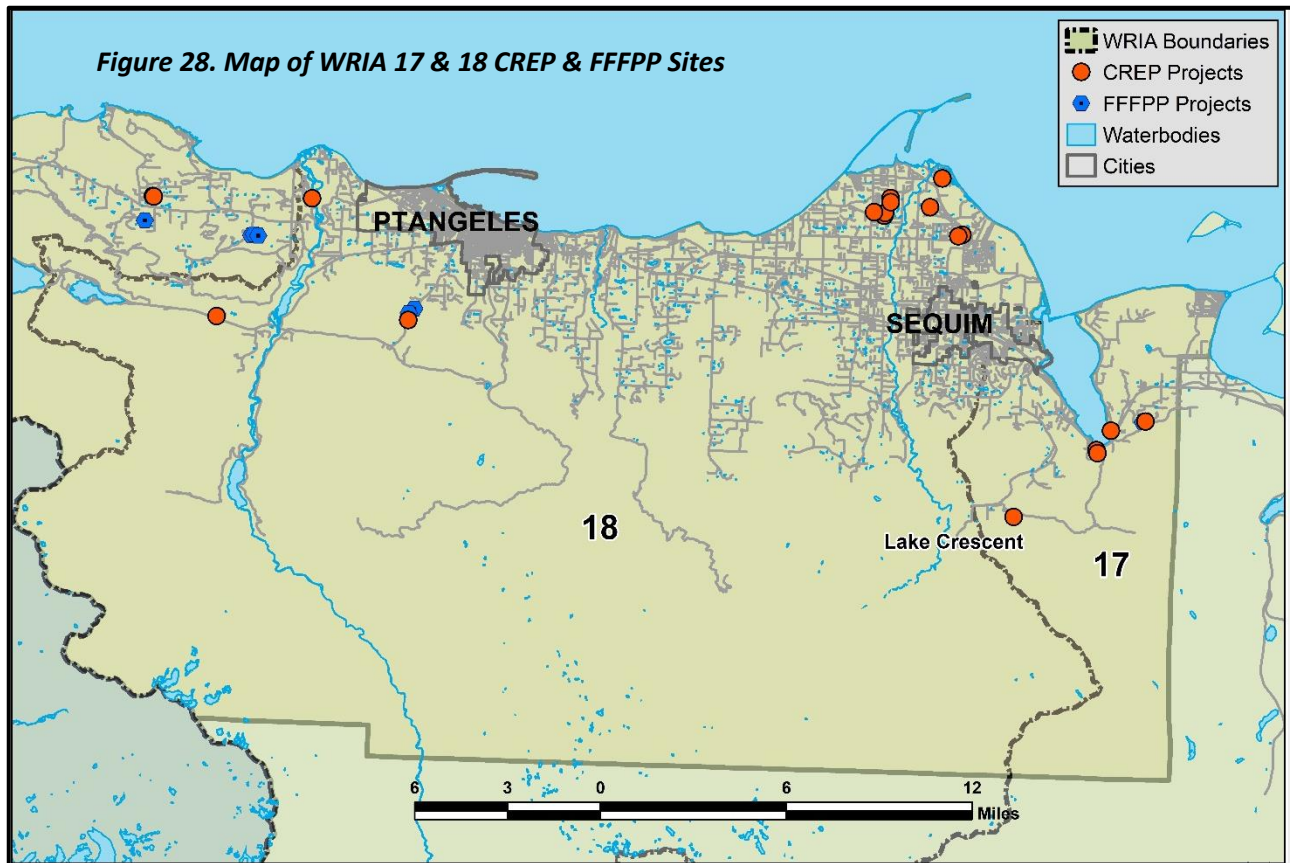
Thanks to years of outreach and technical assistance, most livestock operations in the Dungeness Bay drainage are implementing best management practices to protect water quality. Small horse and livestock operations in the western portion of WRIA 18 have received considerably less attention.



Salmon Restoration

Most of the salmon restoration work conducted in WRIs 17 and 18 has been in the Elwha and Dungeness rivers. Work performed by or sponsored by Clallam Conservation District has focused on increasing instream flows in the Dungeness River by reducing irrigation water diversions, riparian forest restoration, correcting barriers to fish passage, and US Forest Service road decommissioning in the upper Dungeness River watershed. More detail about irrigation water conservation is provided below.

Most riparian restoration work has been done through CREP. Fifteen CREP projects have been implemented in WRIs 17 and 18, out of a total of 24 countywide. All of these projects have been along small streams, such as Meadowbrook, Matriotti, Lotzgesell, and Jimmycomelately creeks.



In 2001, Clallam Conservation District was the lead agency for the new channel construction for the Jimmycomelately Creek restoration project. In 2003, the district sponsored a salmon recovery grant that funded major road decommissioning along the Dungeness River on US Forest Service land.

Water Quantity and the Dungeness Water Rule

In January 2013, the Department of Ecology approved the Dungeness Water Rule (<http://www.ecy.wa.gov/programs/wr/instream-flows/dungeness.html>). The rule places restrictions on new water uses in east WRIA 18 (Bagley Creek to Bell Creek watersheds), including restrictions on new water right permit exempt wells. All new water uses must be mitigated. For permit exempt wells, a one-time mitigation fee must be paid and indoor water use should not exceed 150 gallons per day. Outdoor water is also severely restricted and must be mitigated. The table below illustrates the mitigation packages that are offered by Washington Water Trust, the administrator of the Dungeness Water

Exchange. More information about the Dungeness Water Exchange can be found at <http://www.washingtonwatertrust.org/dungeness-water-exchange-faqs>.

Mitigation Package Descriptions				
Package Description	Average Amount of Indoor Use (Gallons/Day)	Average Amount of Outdoor Use (Gallons/Day)	Amount of Irrigated Lawn Area (Square Feet)	Amount of Irrigated Lawn Area (Acres)
Indoor Only Package (minimal incidental outdoor use only) \$1,000	150* (average)	0	0	0
Indoor with Basic Outdoor Package \$2,000	150* (average)	89	2,500 sq. ft. (approx. 50 x 50 ft.)	.06 acres
Indoor with Extended Outdoor Package \$3,000	150* (average)	200	5,625 sq. ft. (approx. 75 x 75 ft.)	.13 acres

*Note: The Exchange accounts for domestic mitigation using a standard average daily amount of 150 gallons (WAC 173-518-080 (b)). This is the annual amount of water that the Exchange and the mitigation certificate purchaser agree upon as the basis for their transaction.

Figure 29. Dungeness Water Rule Mitigation Packages

Well Metering Pilot Project

All new water subject to the Water Rule uses must be measured. In 2018, the legislature funded a pilot project to provide meters at no cost. Funding for the program was provided to the Department of Ecology, which contracted with Clallam Conservation District to administer the well metering pilot project.

Aquifer Recharge

New water uses in the Dungeness Water Rule area are mitigated primarily through aquifer recharge. Aquifer recharge projects utilize the irrigation network to deliver Dungeness River water to sites that are conducive to infiltration into the shallow aquifer and benefit the streams that are impacted by groundwater pumping. A water right allows for up to 131 acre feet of water to be diverted from the river for aquifer recharge from May 15 to July 15. Additional water can be diverted when the river is running consistently high and exceeding established minimum flows, which is typically in spring and early summer. Through the spring of 2020, Clallam Conservation District had managed the construction of nine aquifer recharge projects, seven of which are east of the Dungeness River. Four of the projects utilize the mitigation water right, and five are used for stream flow restoration purposes when Dungeness River flows exceed minimum flows. The total infiltration capacity of these existing nine facilities is estimated to be 6-8 cubic feet per second. The aquifer recharge project locations are noted on the Figure 30 map.



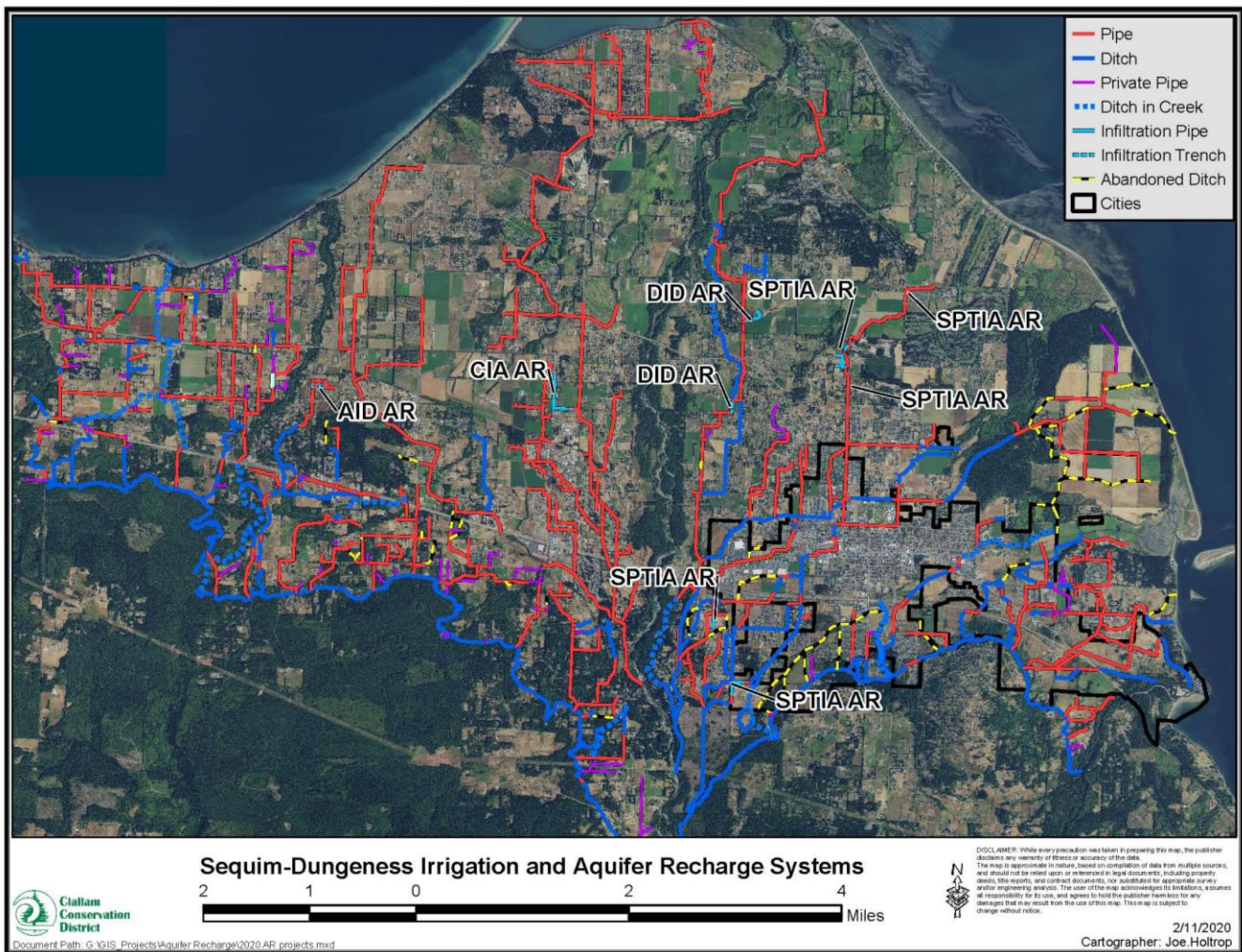


Figure 30. Map of Aquifer Recharge Site Locations

Irrigation in the Dungeness Valley

The vast majority of agriculture in Clallam County occurs in the Dungeness Valley, where due to low rainfall (15-20 inches per year), irrigation is essential for profitable production. An extensive system of approximately 173 miles of irrigation water conveyance ditches and pipelines delivers water from the Dungeness River to 6,000-7,000 acres of irrigated land. Figure 32 shows the boundaries of the seven irrigation districts and companies in the Dungeness Valley and the current distribution of irrigation ditches and pipelines.

A majority of the irrigation ditch piping has occurred since the 1998 federal listings of the Puget Sound Chinook Hood Canal summer chum salmon as threatened species under the Endangered Species Act. The irrigation districts and companies had a *Comprehensive Water Conservation Plan* prepared that same year. The plan proposed a number of alternatives for saving irrigation water, with piping open ditches comprising the vast majority of proposed projects intended to reduce water diversions from the Dungeness River. The total estimated water savings ranged from 33.42 cfs to 38.36. The preferred recommendation included piping 69 miles of ditch and constructing several re-regulating reservoirs. This would have saved 28 cubic feet per second (cfs) at an estimated cost of \$9 million in 1999 dollars. An environmental impact statement was prepared for the plan in 2003.



In 1999, roughly 35 of the 173 miles of conveyance system consisted of pipelines. Between publication of the conservation plan and the start of the 2020 irrigation season, well over 50 irrigation efficiencies projects had been implemented, resulting in the piping of approximately 75 miles of ditch at a cost of over \$15 million. The estimated water savings totals over 31 cfs or nearly 10,000 acre-feet annually. There are now a total of approximately 110 miles of pipelines. Figure 31 shows the estimated annual water savings in cubic feet per second in comparison to miles of pipeline installed and cost from 2000 through 2017.

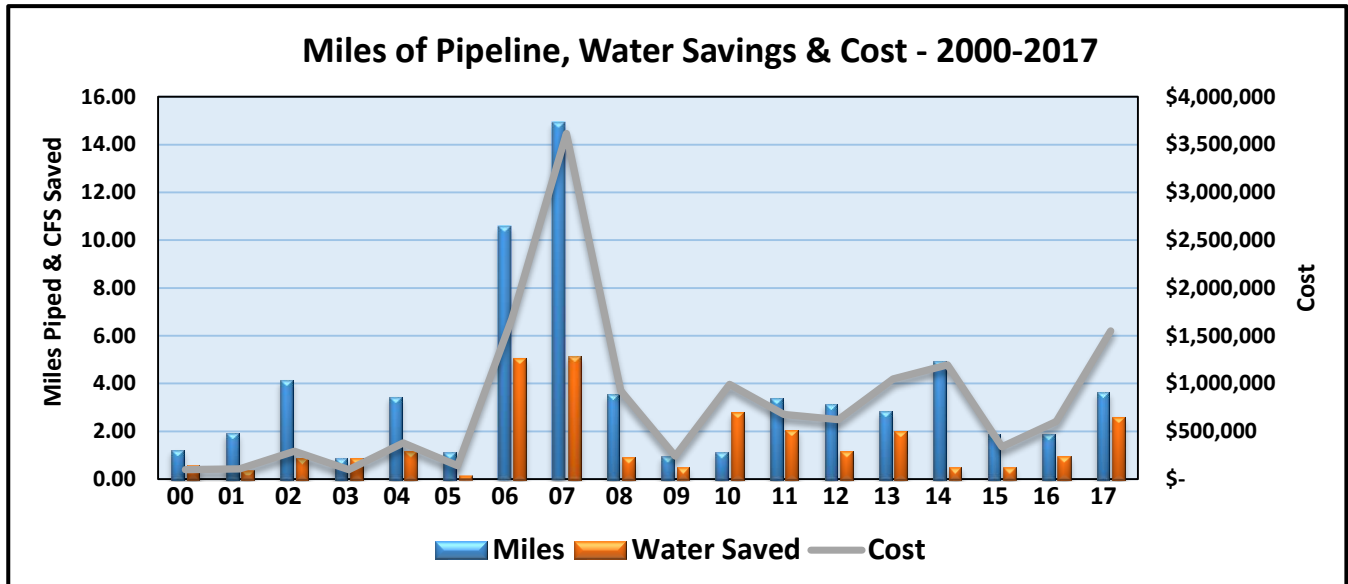


Figure 31. Irrigation Ditch Piping Summary

In 2012 the Department of Ecology issued the irrigation districts and companies superseding water right certificates that reflect their current irrigation water requirements. Their water rights have been reduced from the 1924 adjudicated amount of 516 cfs to the present amount of 98.5 cfs (including a 5-cfs right on McDonald Creek), which realistically reflects their needs. The irrigators have also agreed to not take more than 50 percent of the river’s flow and not allow the flows to go below 60 cfs.



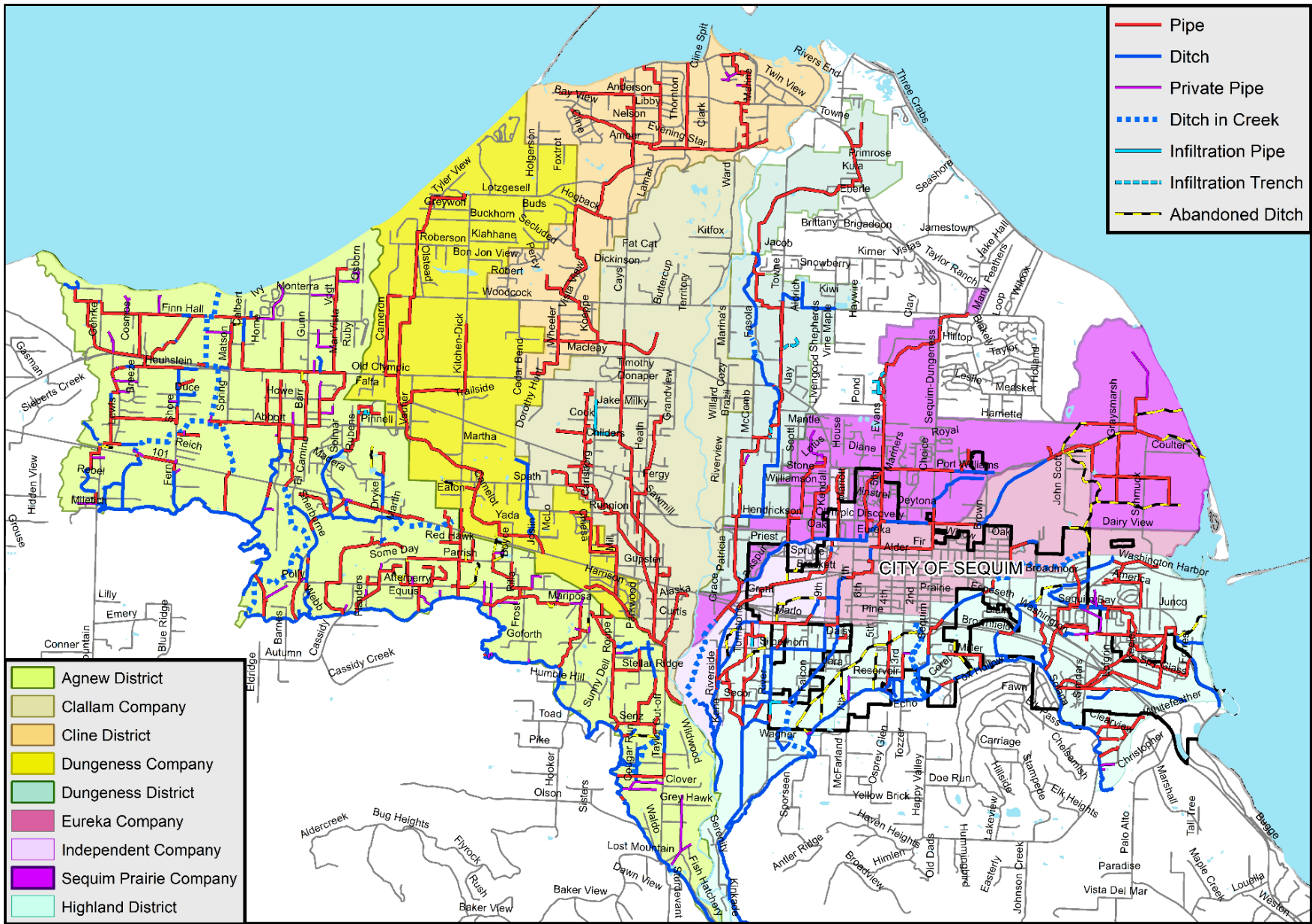


Figure 32. Map of Sequim-Dungeness Irrigation System

Irrigation Water Storage

A feasibility study for irrigation water storage was conducted in 2015. The intent of the study was to identify sites for small scale reservoirs throughout the Dungeness Valley. This followed an ill-fated effort in 2007 to develop a large reservoir uphill of the Agnew Irrigation District main canal. The project never moved forward, largely because of costs, including the cost of leasing the land from the Department of Natural Resources (DNR), ongoing annual operation (pumping from the canal to fill the reservoir) and maintenance, and the estimated construction cost. It was concluded from the 2015 feasibility study that many smaller reservoirs were also impractical for a variety of reasons. The scale of small reservoirs in the more densely populated valley results in much larger acre-foot storage costs. Also, there are very few suitable sites for reservoirs.

However, a suitable site for a large reservoir was identified on DNR land south of the City of Sequim. This site is relatively flat with a Highland Irrigation District irrigation ditch running through the middle of it, and could support the construction of an 80-plus acre reservoir that could store over 1,500 acre-feet of water. In addition to being supplied with water from the irrigation system during the spring snow-melt period, winter runoff water that currently overwhelms irrigation ditches in the City of Sequim could be easily diverted into the reservoir, thus serving the dual purpose of storing water for late summer irrigation and reducing winter flooding. Most of the irrigation water demand on the east side of the Dungeness River could be supplied by this reservoir during the last four to six weeks of irrigation season. This is the period in which the Dungeness River is at its lowest; therefore, diversions from the river would be reduced substantially and in-stream habitat could improve significantly. The DNR manages the land for timber production on the low production 400-acre site, and the DNR support transfer of the property to another government entity. Clallam County is the proposed property owner and would manage the vast majority of the property as County park. Planning and fund-raising work for a large reservoir has been ongoing since 2015 with a broad group of stakeholders that have received good public support. Grants for land acquisition and final design and permitting were secured by Clallam County in 2019. The image below shows the conceptual plan for the reservoir.

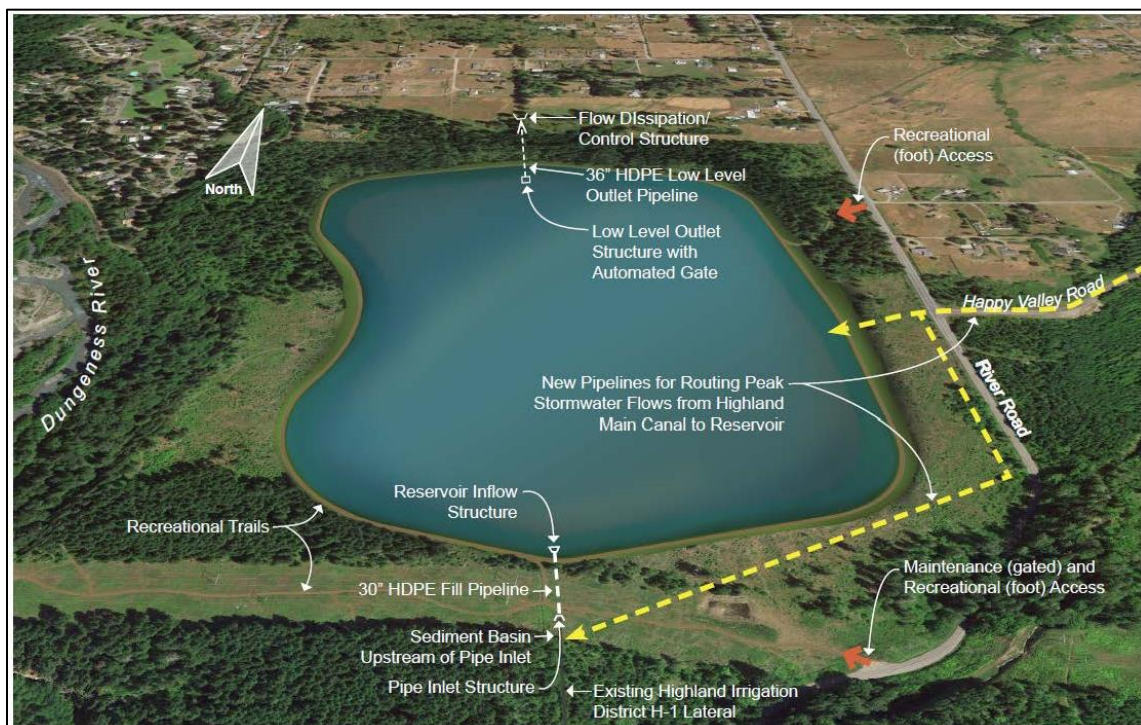


Figure 33. Dungeness Off-Channel Reservoir Conceptual Image

WRIA 19 DEMOGRAPHICS AND LAND USE DESCRIPTION

Approximately 4,500 people live in WRIA 19. There are no cities in WRIA 19; Joyce, Clallam Bay and Neah Bay are the most urban population centers. Over half the people in the WRIA live in the Joyce area west of Port Angeles. This area is the only part of WRIA 19 that has experienced significant population growth in recent years. Due to its proximity to Port Angeles, it will likely continue to experience population growth. The Makah Reservation totals about 9,234 acres of land in the northwestern tip of WRIA 19.

Commercial timber is the prominent land use. Seventy-six percent of the WRIA is zoned commercial forestry, of which 53 percent is privately owned, 24 percent is state trust land, and 19 percent managed by federal agencies.

Most of the agricultural activity is in the eastern portion of WRIA 19, in the Salt Creek basin, an area of glacial outwash that drains a series of low hills. A couple of small organic produce farms located in the Salt Creek area have done direct sales and one has operated a Community Supported Agriculture (CSA) farm.

Numerous small, independent streams drain to the Strait of Juan de Fuca in WRIA 19, the most prominent of which are Salt Creek, East Twin River, West Twin River, Deep Creek, Pysht River, Clallam River, Hoko River, and the Sekiu River. Unlike the snowmelt-fed streams flowing out of the Olympic Mountains, these streams and rivers are rain-fed, thus more prone to late summer low flows. Lake Crescent and its distributary, the Lyre River, are also in WRIA 19.

WRIA 19 Major Natural Resource Issues and Opportunities

Bull trout, a threatened species, is present throughout WRIA 19. The combination of forest roads for timber production and state and county roads crossing the numerous streams contribute to numerous culverts that are barriers to fish passage. Ten of the 17 Family Forest Fish Passage Program projects sponsored by Clallam Conservation District have been in WRIA 19. These projects, as well as CREP projects in WRIs 19 and 20 are depicted in the map below. In addition, numerous streams are classified as impaired due to high water temperatures and sedimentation, although the data that these classifications are based on are outdated. Water temperature and sedimentation impairments are typically associated with historic timber harvesting practices (e.g. harvesting trees within riparian areas) and forest road construction and maintenance. Current forest practices regulations, including road maintenance and abandonment plans are intended to prevent these impacts. Timber harvests, particularly on Department of Natural Resources lands, are significantly limited in order to protect nesting habitat for the marbled murrelet, which is listed as a threatened species.

Out of 24 CREP projects implemented, seven have been in WRIA 19. Additional opportunities exist for riparian forest restoration in WRIA 19, particularly in the Salt Creek basin.

A prioritized list of salmon habitat conservation and recovery actions for WRIA 19 was prepared in 2012; however, the focus of that action plan was habitat preservation through land acquisition.

Groundwater is the primary source of domestic water supplies in WRIA 19, including a PUD #1-supplied water system in the Clallam Bay-Sekiu area. This water system serves 344 customers and the Clallam Bay Corrections Facility. The PUD also supplies water from a surface source (Olsen Creek) to 34 customers in the Island View Subdivision, located approximately six miles west of Sekiu. Like many water supplies in WRIs 19 and 20 that are fed by rainfall, this one is particularly vulnerable to drought and water shortages. The PUD implements its multi-stage water shortage response plan based on flows in the nearby Hoko River.

In 2005, Clallam Conservation District provided cost-share assistance to landowners on the Clallam River for installation of a rainwater harvesting system. The system included new gutters and downspouts on two



barns, a cistern to store runoff water, and a stock tank. The system provides adequate water for cattle, thus enabling the landowners to exclude their cows from the Clallam River and not be dependent on the PUD water supply.

Neah Bay and the Makah Reservation experiences similar water shortages; their water sources include both surface and groundwater, much of which originates in WRIA 20.

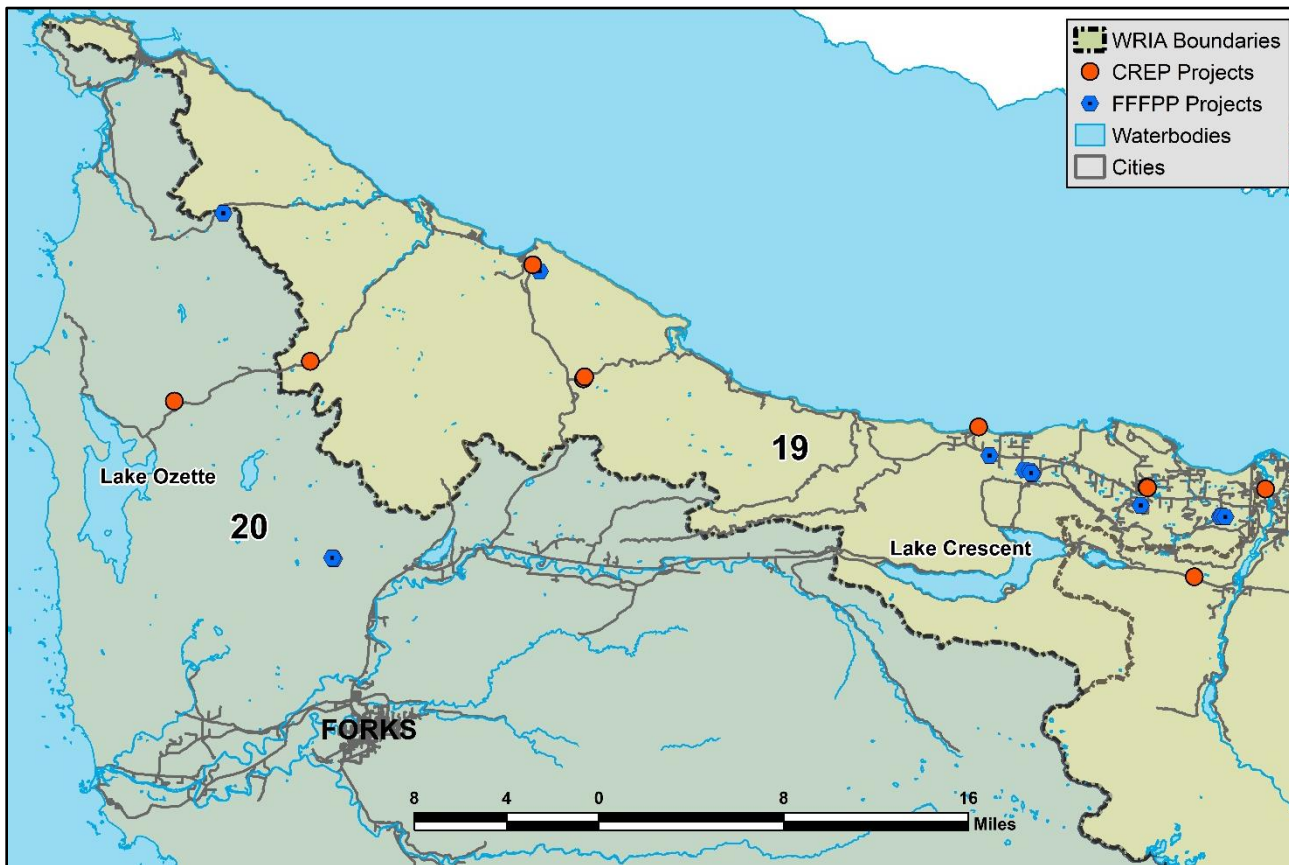


Figure 34. Map of WRIA 19 & 20 FFPP & CREP Sites

WRIA 20 DEMOGRAPHICS AND LAND USE DESCRIPTION

Forks is the only incorporated city within WRIA 20. The city covers a land area of 4.11 square miles with a nearly equal sized urban growth area. The 2019 population was estimated at 3,968.

WRIA 20 includes four Indian reservations: the Quileute, Hoh, Ozette and Makah. The Ozette Reservation is under treaty jurisdiction of the Makah Tribe and is currently managed as wilderness. The Hoh reservation is in Jefferson County. Olympic National Park makes up 127,299 acres, or 25.4% of WRIA 20, and the US Forest Service land is 88,974 acres for a total of 216,973 within the WRIA (43.3%).

Commercial timber harvesting is the dominant land use in the area. There are approximately 158,452 acres in large commercial timber holdings within WRIA 20, totaling 31.6% of the land area in the WRIA.

Much of the initial agricultural settlement of the area was located in and around the Forks Prairie, where lack of trees and fertile soil made farming a viable option. Today, agriculture in WRIA 20 is sparse and mostly limited to pasture and hay production for small-scale beef operations.

Like many areas on the Olympic Peninsula, WRIA 20 has seen a continued growth in recreational use of public lands. These lands are being promoted as an increasing source of economic development for the rural communities of the area. Among the many recreational activities are hiking, camping, sport fishing, hunting, bird watching, and mountain biking. As recreational use continues to increase, so too will the impacts these activities have on the land.

Major water bodies of WRIA 20 include the Sol Duc, Calawah, Bogachiel, Dickey and Quillayute rivers, and Lake Ozette and Lake Pleasant.

WRIA 20 Major Natural Resource Issues and Opportunities

The Lake Ozette sockeye salmon and bull trout are listed as threatened species. Like WRIA 19, culverts that are barriers to fish passage are a major natural resource concern in WRIA 20. In addition, inadequately maintained forest roads, mainly on US Forest Service land, are subject to mass wasting due to deteriorated or undersized culverts, and the Forest Service lacks funding for road maintenance and culvert upgrades. Numerous streams are classified as impaired due to high water temperatures; however, as noted above, these classifications are based on old data and are likely legacy listings resulting from past forest practices activities that have long since improved. As is the case in WRIA 19, timber harvests on Department of Natural Resources lands are significantly limited due to marbled murrelet nesting habitat protections.

Clallam Conservation District has sponsored four FFFPP projects in the WRIA. In addition, the district partnered with the US Forest Service on major road maintenance projects involving removal and replacement of numerous undersized culverts in the Goodman Creek (Sol Duc River tributary) and Sitkum River (Calawah River tributary) basins. New partnerships have recently been forged with the Quileute Tribe to collaborate on projects that benefit salmon habitat in WRIA 20.

There have been two CREP projects in WRIA 20, both on Lake Ozette tributaries; one on the Big River and one on Trout Creek. Opportunities exist for additional riparian forest restoration in WRIA 20, and outreach efforts are presently underway with landowners along the Bogachiel River, including the Quileute Tribe, for enrollment in CREP.

The water supply for the City of Forks and surrounding areas is groundwater. Despite the heavy rainfall of the area, these groundwater supplies can run low during drought years. Work is underway to evaluate options for increasing water supply capacity, including drilling more and deeper wells.

During the drought of 2019, Clallam Conservation District partnered with the City to install a cistern for roof runoff water collection and storage. The primary objective of the project was to demonstrate how to harvest rainwater for small scale irrigation of gardens and livestock watering.

