



# 5-Year Plan (2013 to 2018) Clallam Conservation District Resource Inventory

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## GENERAL INFORMATION

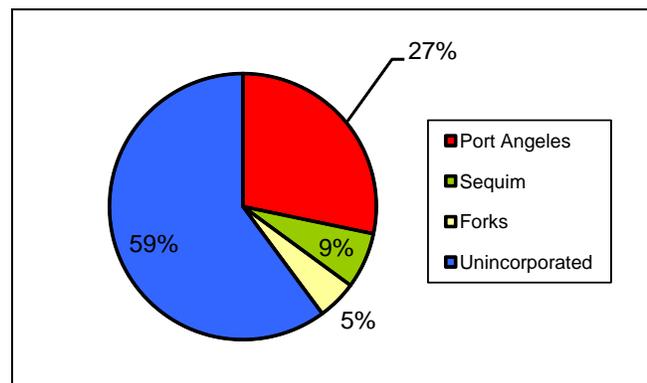
Clallam County consists of 1,739 square miles (1,112,960 acres) along the northern portion of the Olympic Peninsula. Annual precipitation ranges from a low of 17 inches at Sequim to over ten feet near Forks. According to census results, the population of Clallam County in 2010 was 71,404. The estimated population in 2011 was 71,838. Approximately 59% of the population lives in unincorporated areas. The County's population grew by 10.6% from 2000 to 2010, with almost all the growth in the eastern third of the county. The median age is 49. Over 40% of the population is over age 55, nearly one in four persons being over 65. Slightly less than one-quarter of those over 25 years of age have a bachelor's degree or higher. The home ownership rate is 71.1%. A total of 32.9 square miles (1.9% of the county) have been identified as Urban Growth Areas.



## Urban Land Areas in Clallam County

Unit	Square Miles
Total County	1,739 (1,112,960 ac)
Port Angeles	10.1 (6,464 ac)
Sequim	5.3 (3,392 ac)
Forks	3.4 (2,176 ac)
UGAs	32.9 (21,056 ac)
Unincorporated	1,720 (1,100,800 ac)

## Population Distribution of Clallam County

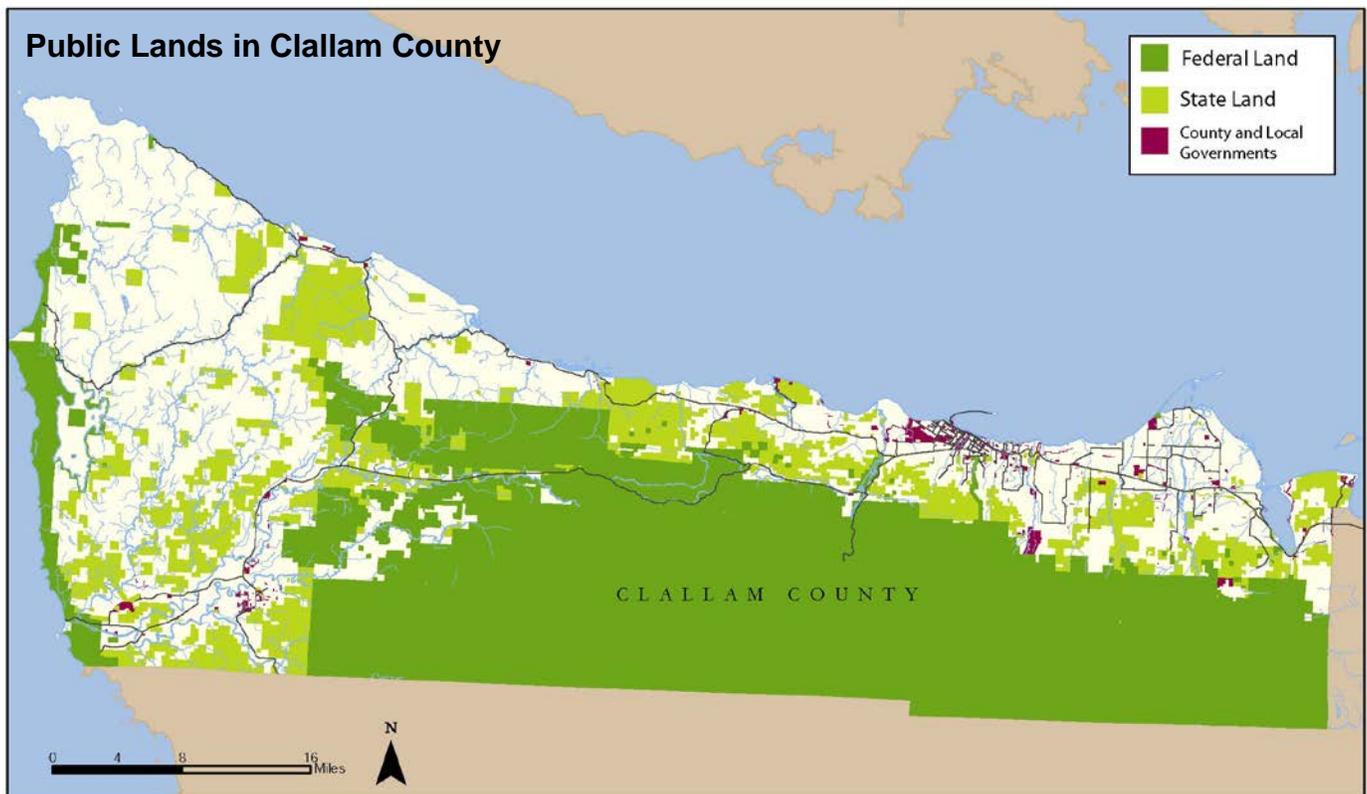
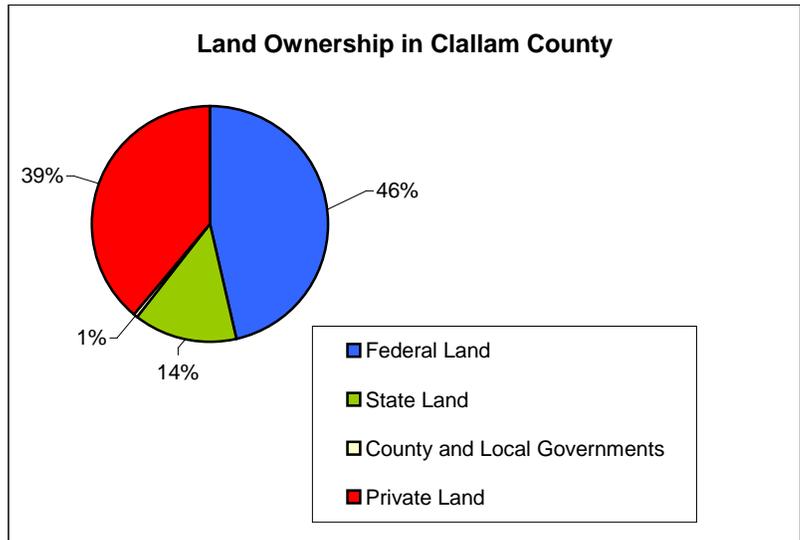


Unit	Population (2011)	% of Total County Population
Port Angeles	19,080	27%
Sequim	6,625	9%
Forks	3,500	5%
Unincorporated	42,395	59%

### Land Ownership in Clallam County

Public land makes up approximately 61% of Clallam County.

Ownership	Acres
<b>Federal Land</b>	523,496
ONP	318,093
ONF	199,209
Other Federal Land	6,194
<b>State Land</b>	160,377
State Forest Board and DNR Lands	154,530
State Parks	2,488
Other	3,359
<b>County and Local Governments</b>	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
<b>Private Lands</b>	437,602



### Agriculture in Clallam County

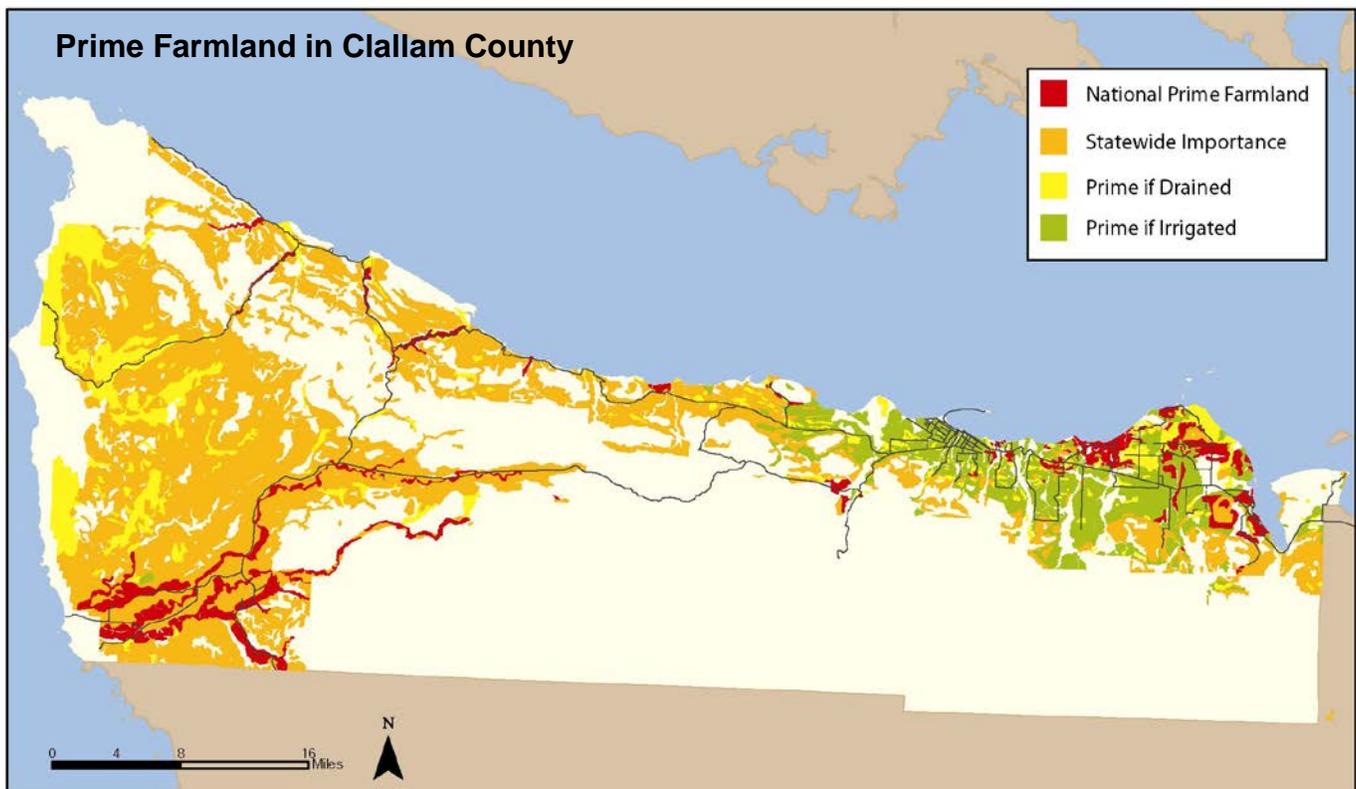
According to the USDA Census of Agriculture ([http://www.agcensus.usda.gov/Publications/2007/Online\\_Highlights/County\\_Profiles/Washington/cp53009.pdf](http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Washington/cp53009.pdf)), the number of farms in Clallam County in 2007 was 512, a 13% increase from 2002. The total acreage of farmland in 2007 was 22,822, up 2% from 2002. The average farm size decreased from 49 acres in 2002 to 45 acres in 2007. Only 41% of principle farm operators listed farming as their primary occupation, and the average age reported was 59.2. The average net farm income reported in 2007 was -\$6,182.

The main agricultural products in Clallam County consist of dairy, beef cattle, hay, vegetable seeds, and lavender. Of the 6,499 acres reported in production, over 89% was in forage crops in 2007. Most farming in the County is concentrated in the Sequim-Dungeness Valley area.

Although farm acreage increased from 2002 to 2007, the 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. There were 6,078 cows and calves and 1,170 horses and ponies reported in 2007. Small horse farms account for the majority of the farm 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, which are based on soil type. A majority of these acres are in the western portion of the county; however, due to high precipitation and the remoteness of the area, there is very little commercial agriculture in this area. Most of these lands are in commercial forestry.

Most commercial agriculture occurs in the Dungeness Valley where roughly 6,000 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. The seven entities are collectively organized under the Sequim-Dungeness Valley Agricultural Water Users Association.



### **Farm Inventory**

In 2006, Clallam Conservation District conducted an inventory of farms throughout Clallam County. This inventory was a “windshield survey” conducted by vehicle from public and some private roads. Aerial photographs and GIS parcel data were reviewed to determine likely farm locations and the presence of water bodies. Observations of horse

and livestock access to water bodies, pasture condition, heavy use areas and manure storage were made in the field from roads.

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.

A total of 1,252 farms were inventoried and 117 were classified as high priority farms. The table below shows the geographic distribution of high priority farms and their current status.

<b>AREA</b>	<b>ORIGINAL</b>	<b>REMOVED</b>	<b>REMAINING</b>
Clean Water District	45	26	19
Port Angeles Area	41	11	30
West of Elwha	31	2	29
<b>TOTALS</b>	<b>117</b>	<b>39</b>	<b>78</b>

Workshops were 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. Of the 73 farms participating in the first round of workshops, only five were high priority. High priority farm participation in workshops has improved in recent years; however, less than 20 percent of the high priority farms have attended workshops.

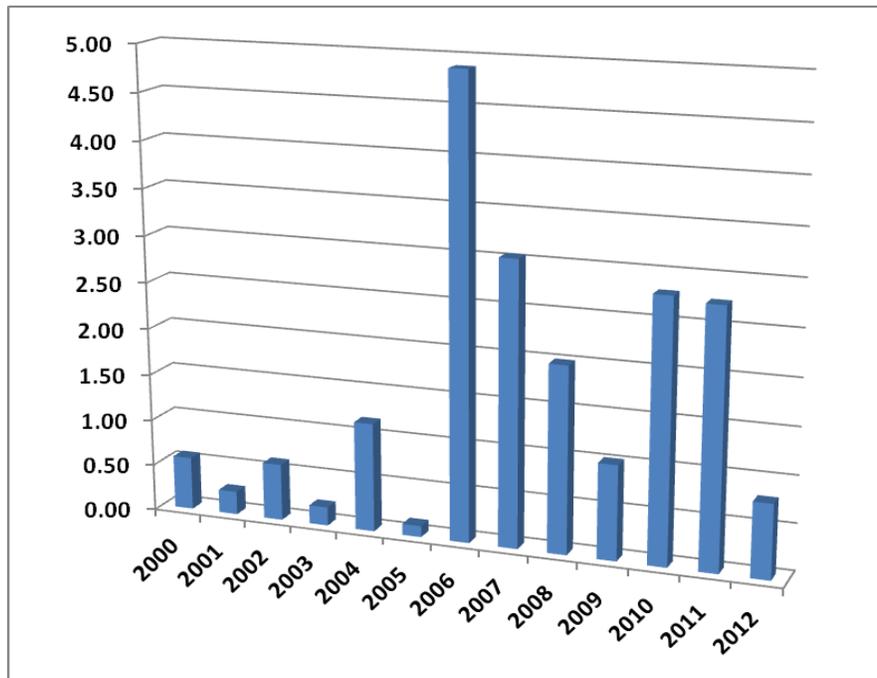
**Irrigation in the Dungeness Valley**

The vast majority of agriculture in Clallam County occurs in the Dungeness Valley. Due to low rainfall (15-20 inches per year) in the valley, irrigation is essential for commercial agriculture. An extensive system of irrigation water conveyance ditches and pipelines delivers water from the Dungeness River to irrigated lands. The map below shows the boundaries of the seven irrigation districts and companies in the Dungeness Valley and the current distribution of irrigation ditches and pipelines. Irrigated acres total approximately 7,000. There are approximately 183 miles of distribution canals, ditches and pipelines, little more than half of which are now pipelines.

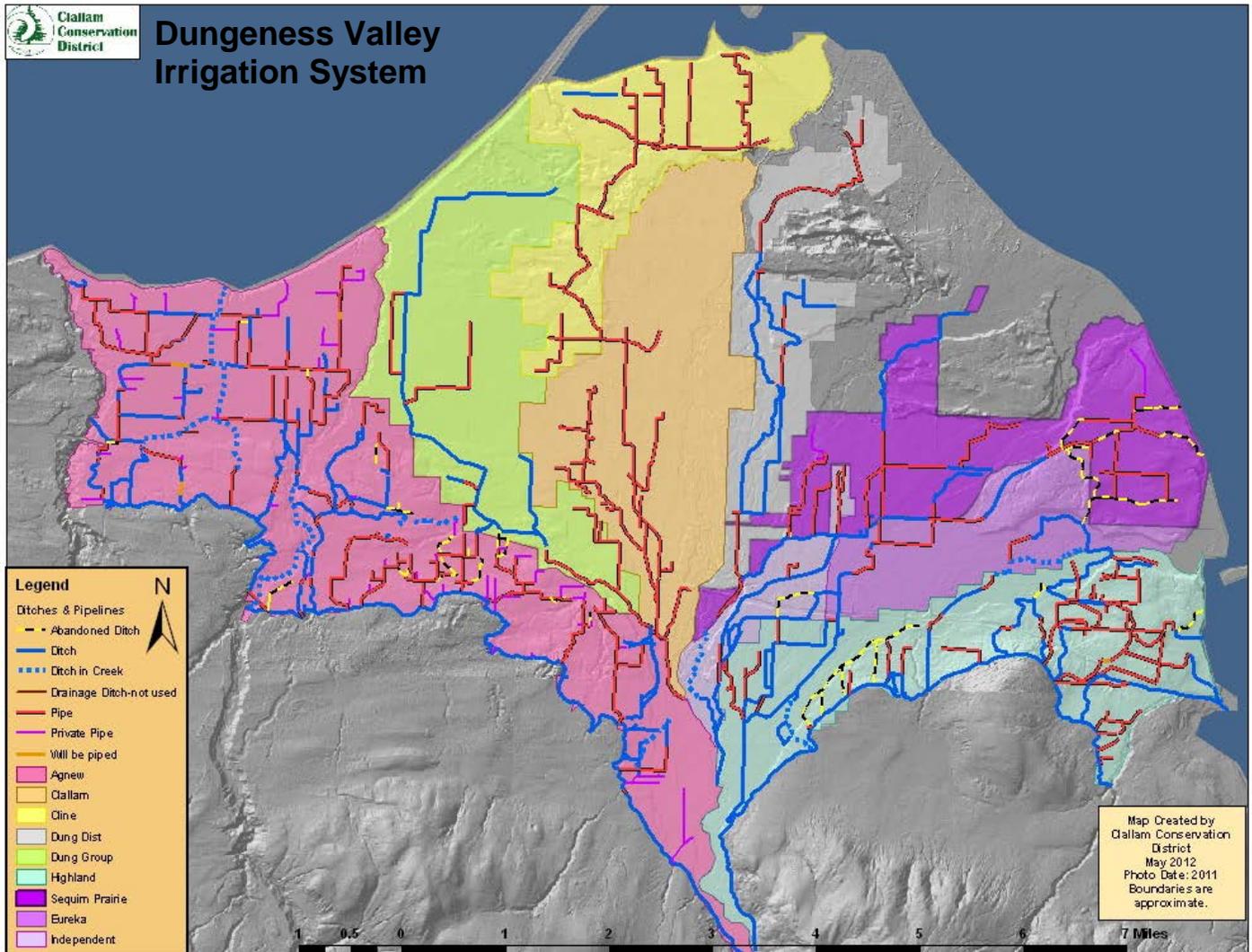
Well over half of the irrigation ditch piping has occurred since the 1999 federal listing of the Puget Sound Chinook salmon as threatened. Hood Canal summer chum, bull trout and steelhead have each been added to the ESA list since. A *Comprehensive Water Conservation Plan* was prepared for the irrigation districts and companies in 1999. Various measures intended to reduce water withdrawals from the Dungeness River are identified in the plan. The vast majority of proposed projects are piping of open ditches. The total estimated water savings range from 33.42 cubic feet per second (cfs) to 38.36. An environmental impact statement was prepared for the plan in 2003. A *Comprehensive Irrigation District Management Plan (CIDMP)* was prepared in 2006 (<http://www.clallamcd.org/publications/>) in an effort to secure ESA and Clean Water Act protection; however, the proposed actions were not formally adopted by the irrigation districts and companies.

In 2012 the Department of Ecology issued the irrigation districts and companies superseding water rights certificates that reflect their current irrigation water needs (<http://www.ecy.wa.gov/programs/wr/instream-flows/dungeness/wua-ecology-moa-09062012.pdf>). Their water rights have been reduced from the 1924 adjudicated amount of 516 cfs to the more realistic present amount of 93.5 cfs. The irrigators have also agreed to never take more than 50 percent of the river’s flow and not allow the flows to go below 60 cfs.

By the end of the 2012 irrigation season, over 30 irrigation efficiencies projects had been implemented resulting in total estimated water savings in excess of 20 cfs, or about two-thirds of the target amount of savings. The chart below shows the estimated annual water savings in cubic feet per second.

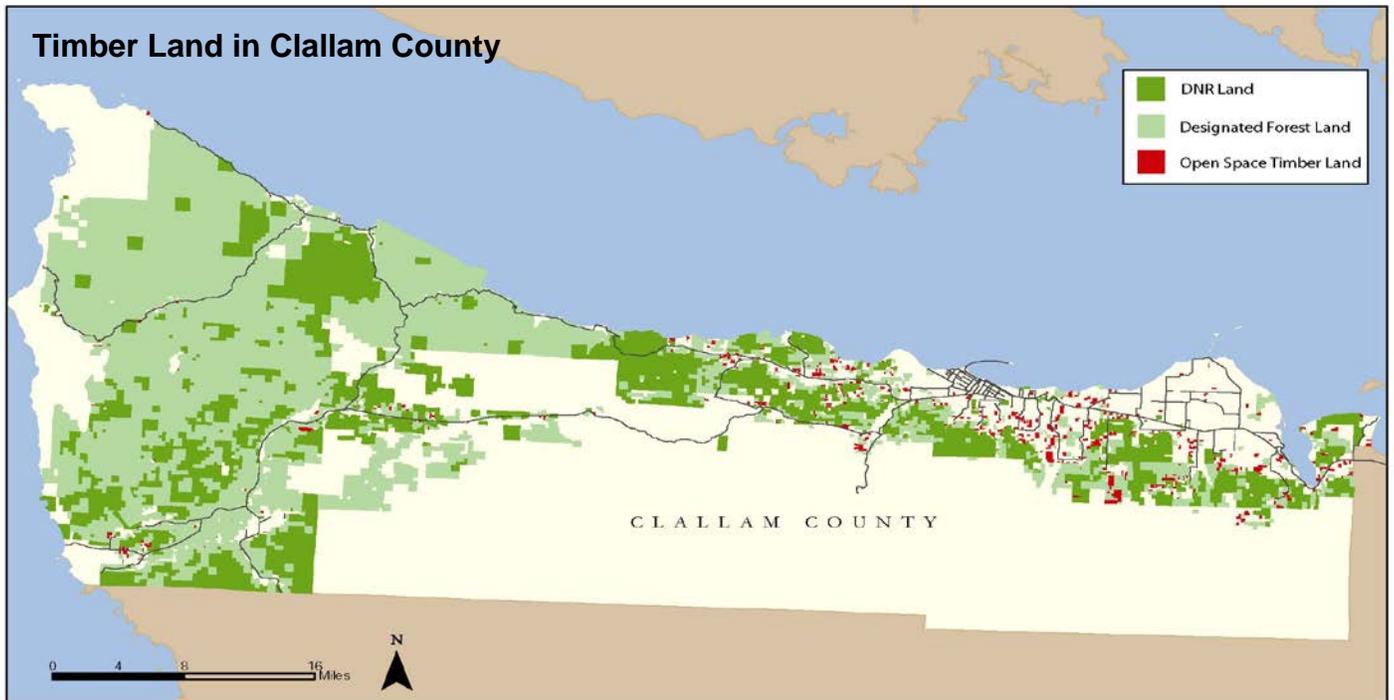


Annual Irrigation Efficiencies Water Savings (cfs)



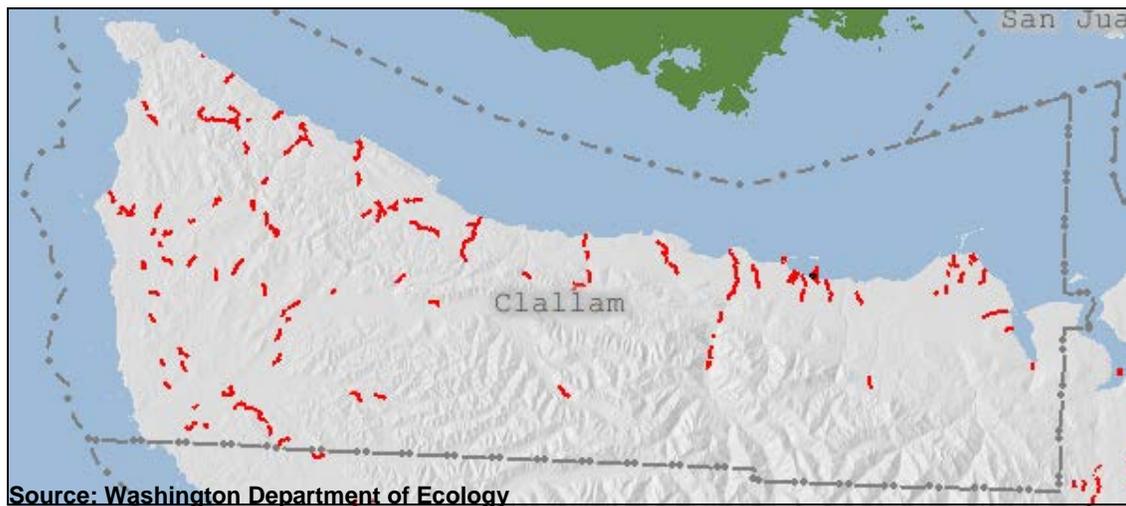
**Timber Land in Clallam County**

Timber production is the dominant land use in the County with 285,842 acres in large commercial timber holdings. Widespread timber harvesting in the area began in the 1920's and continued intensively through the 1980's, at which time the rate slowed significantly due in part to the listing of two old growth coniferous forest dependent species – the northern spotted owl and marbled murrelet – as threatened species under the federal Endangered Species Act. The Washington Department of Natural Resources manages approximately 76,665 acres as state trust lands. The majority of private forestland is managed for industrial timber production.



### Impaired Water Bodies in Clallam County

The map below shows the water bodies listed on the 2008 Clean Water Act 303(d) list as impaired. The 2010 water quality assessment was approved by the EPA in December 2012, but as of early January 2013, the list was not available publicly (<http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>).



The main water quality parameter not meeting standards in the western portion of the county is high temperatures. High water temperature is typically attributed to a loss of riparian vegetation and shade, often associated with past

logging practices in which trees were cut down to the water's edge. Other common impacts to the streams in the county include high levels of fecal coliform bacteria and low levels of dissolved oxygen.

The table below lists the water bodies that fail to meet water quality standards for fecal coliform bacteria and dissolved oxygen. Fecal coliform bacteria are indicators of waste from warm blooded animals and are typically associated with livestock, failing septic systems and wildlife. Low dissolved oxygen commonly results from excess nutrients and subsequent algae growth and die-offs.

<b>IMPAIRED WATER BODIES</b>		
<b>WRIA</b>	<b>Fecal Coliform</b>	<b>Dissolved Oxygen</b>
<b>17</b>	Jimmycomelately Creek	Jimmycomelately Creek
	Johnson Creek	
<b>18</b>	Dungeness Bay	Bell Creek
	Bell Creek	Cassalery Creek
	Cassalery Creek	Cooper Creek
	Cooper Creek	Meadowbrook Creek
	Meadowbrook Creek	Siebert Creek (WF)
	Meadowbrook Creek trib	Lees Creek
	Hurd Creek	Dry Creek
	Matriotti Creek	Port Angeles Harbor
	Owl (Bear) Creek	
	Mudd Creek	
	Bagley Creek	
	Peabody Creek	
	Valley Creek	
	Tumwater Creek	
Port Angeles Harbor		
<b>19</b>	Strait of Juan de Fuca (Pysht)	Salt Creek
		Deep Creek
<b>20</b>	Dickey River	Bear Creek
		Lake Creek
		Big River
		Siwash Creek
		South Creek

The Dungeness-Sequim Bay Watershed Clean Water District was established in 2000 commercial shellfish harvesting was downgraded in Dungeness Bay because of fecal coliform contamination. As required by state law when commercial shellfish harvesting is downgraded, a shellfish protection district was formed as a measure to address nonpoint sources of pollution and clean up the bay. The Clean Water District includes the area of Clallam County east of the Morse Creek watershed.

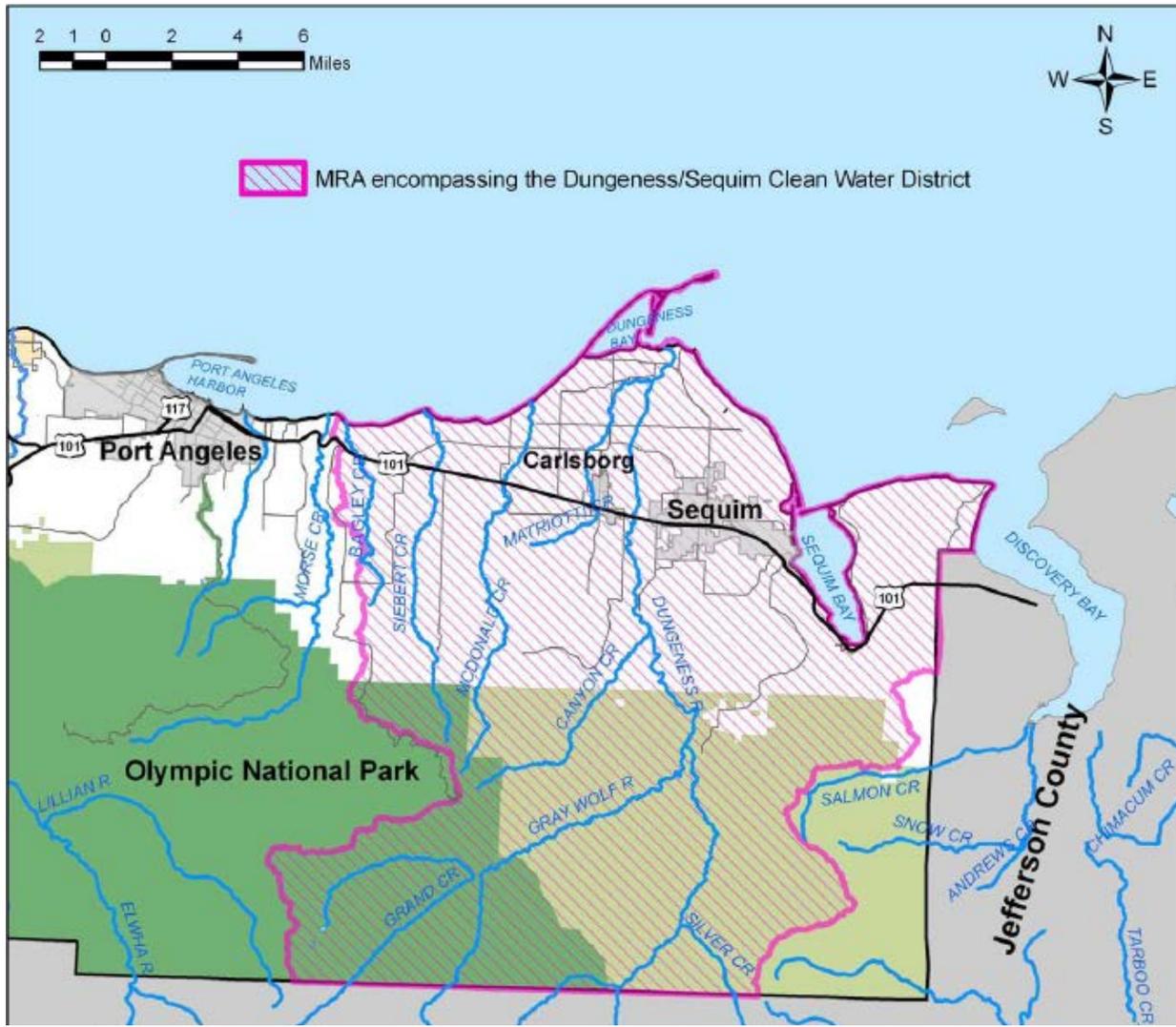
In an attempt to identify the sources of bacterial contamination, two microbial source tracking studies were performed in the lower Dungeness watershed and bay in 2007 and 2008 (<http://www.clallamcd.org/conservation-by-the-bay/?SSScrollPosition=0>). The results represent typical nonpoint source pollution. 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-derived (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%.

Water quality improvements in the bay resulted in a 2011 upgrade of 500 acres from prohibited to conditionally approved for commercial shellfish harvest.

### **On-Site Septic System Operation and Maintenance**

On-site septic systems are potential sources of contamination of both surface and ground water. In 2005, the Washington State Board of Health adopted Chapter 246-272A WAC, requiring local health departments to develop on-site septic system (OSS) management plans, and the following year the Legislature passed a bill requiring local health

jurisdictions to identify Marine Recovery Areas (MRA) where OSS pose an increased public-health risk to marine waters, and to develop management strategies to find and repair all failing OSS within MRA. In 2007, the Clallam County Environmental Health Services (EHS) developed a MRA plan (<http://www.clallam.net/oss/OSSApprovedManagementPlanWithMapsJuly07.pdf>) for the Dungeness-Sequim Clean Water District (see map below).



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.

There are an estimated 20,049 on-site septic systems in Clallam County, approximately 60 percent of which are in the MRA. Only 16 percent of the systems countywide have current reports on file with the County. Eleven percent of the systems without current inspection reports are systems that are assumed to exist but have neither permits nor inspection reports on file at the County. The remaining 73 percent of systems are permitted but their inspection reports are not current.

### **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. The city is required to comply with a *Western Washington Phase II Municipal Stormwater Permit* (<http://www.cityofpa.us/PDFs/Stormwater/StormWaterMgmtProgram.pdf>). There were 120 combined sewer and stormwater overflow (CSO) events in Port Angeles in 2011, resulting in over 17 million gallons of untreated sewage and stormwater discharged to the Port Angeles Harbor. As required by their Phase II permit, the city is making several infrastructure upgrades to reduce the frequency of CSOs. In addition, there are numerous illicit stormwater

discharges to streams that the city is working to correct. Responses to frequently asked questions about CSOs are available at <http://www.cityofpa.us/PDFs/CSO%20PROJECT/CSO-FAQ.pdf>.

Although not yet required, 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](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. 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. The manual remains in draft form and has not been implemented by Clallam County.

## **Threatened, Endangered and Species of Concern in Clallam County**

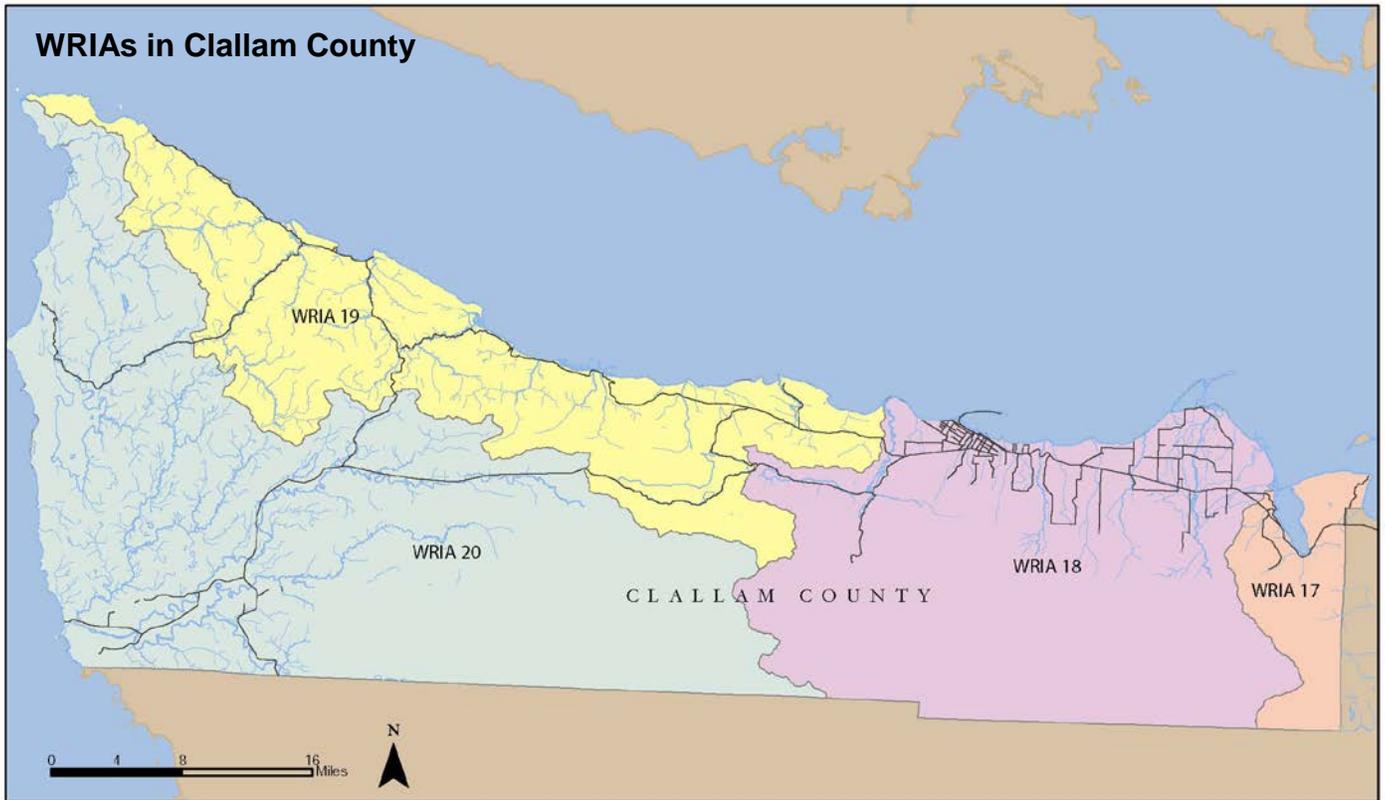
The table below lists the fish and wildlife species listed as endangered (FE), threatened (FT), of concern (FC) and candidate for listing (FSC) under the federal Endangered Species Act, as well as the state species of concern (SC) and sensitive species (SS). Of the species listed, those generally most 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.

MAMMALS		BIRDS		INSECTS	
Blue Whale	FE	Marbled Murrelet	FT	Taylor's Checkerspot	FC
Fin Whale	FE	Northern Spotted Owl	FT	Makah Copper	FSC
Humpback Whale	FE	Streaked Horned Lark	FC	Valley Silverspot	FSC
Killer Whale	FE	Bald Eagle	FSC	Johnson's Hairstreak	SC
Northern Pacific Right Whale	FE	Peregrine Falcon	FSC	Puget Blue	SC
Sei Whale	FE	Tufted Puffin	SC	Sand-verbena Moth	SC
Sperm Whale	FT	Common Loon	SS		
Sea Otter	FC			MOLLUSKS	
Fisher	FC	FISH		California Floater	FSC
Mazama Pocket Gopher	FSC	Chinook Salmon	FT	Northern Abalone	FSC
Steller Sea Lion	FSC	Chum Salmon	FT	Olympia Oyster	SC
Townsend's Big-eared Bat	SC	Ozette Sockeye Salmon	FT		
Keen's Myotis	SC	Steelhead	FT	REPTILES	
Olympic Marmot	SS	Bull Trout	FT	Leatherback Sea Turtle	FE
Gray Whale		Pygmy Whitefish	FSC	Loggerhead Sea Turtle	FE
		Olympic Mudminnow	SS	Green Sea Turtle	FT
STATUS LEGEND					
<i>Federal Endangered</i>	<i>FE</i>	<i>Federal Candidate</i>	<i>FC</i>	<i>State Candidate</i>	<i>SC</i>
<i>Federal Threatened</i>	<i>FT</i>	<i>Federal Species of Concern</i>	<i>FSC</i>	<i>State Sensitive</i>	<i>SS</i>

## 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. The WRIAs in Clallam County include:

- WRIA 17- the Quilcene-Snow watershed (The portion of WRIA 17 that is within Clallam County has been combined with WRIA 18 for watershed planning purposes.)
- WRIA 18- the Elwha- Dungeness Watershed
- WRIA 19- the Lyre-Hoko watershed
- WRIA 20- the Soleduck-Hoh watershed



The plans being 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 is being implemented, including adoption of an instream flow rule establishing minimum instream flows for the eastern half of WRIA 18. A final draft of a WRIA 19 plan has not been completed and approved and the planning group has not been meeting regularly since 2008. The WRIA 20 plan was adopted in 2008. Much of the information included in this inventory is taken from the three WRIA planning documents. Below is a table that summarizes watershed statistics for each WRIA.

WRIA	Total Acres	Percent Acres of County	Population	Percent Population of County
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

## 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; so while the numbers may have changed somewhat, the general proportions remain largely unchanged.

**Open Space AGRICULTURE Taxed land by WRIA in Clallam County**

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
<b>TOTALS</b>	<b>516</b>	<b>17,220</b>	

**Open Space TIMBER LAND (Small Forest Landowners) by WRIA in Clallam County**

Clallam WRIAs	Approximate number landowners with Open Space Timber	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
<b>TOTALS</b>	<b>549</b>	<b>8,236</b>	

**Designated TIMBER LAND by WRIA in Clallam County**

Clallam WRIAs	Approximate number landowners with Designated Timber Land	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
<b>TOTALS</b>	<b>547</b>	<b>387,238</b>	

**WRIA 18 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. The western portion of the County saw little to no growth during that time. 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 2011 was 19,080, an increase of 562 since 2003. The city covers an area of 10.1 square miles. The Sequim population in 2011 was estimated to be 6,625, an increase of 2,185 since 2003. The population of the Sequim School District boundaries (eastern county line to Siebert Creek) increased by 24 percent from 2000 to 2010, while the population of the Port Angeles School District (roughly the west half of WRIA 18) increased by just 5.3 percent during that same period.

The 2006 tax assessor’s information showed approximately 420 landowners have the designation of Open Space Agriculture on their land, for a total of 13,528 acres, or 3.5% of the WRIA.

**WRIA 17 & 18 Major Natural Resource Issues and Opportunities**

The main water bodies within WRIA 18 are the Elwha River and the Dungeness River. Water quality and quantity are major natural resource issues in WRIAs 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 are all listed as threatened species.

A portion of Dungeness Bay at the mouth of the Dungeness River is closed to commercial shellfish harvesting. The remainder of the bay is closed from November 1 through January 31. A microbial source tracking study conducted in bay and freshwater tributaries to the bay in 2009 identified wild birds as the predominant source of fecal coliform bacteria at over 42 percent of the samples. Wild mammals were the second most frequently identified source at 26 percent. Humans, pets and livestock each accounted for about seven percent of the samples. On-site septic system permit and inspection records are seriously incomplete. Because of 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.

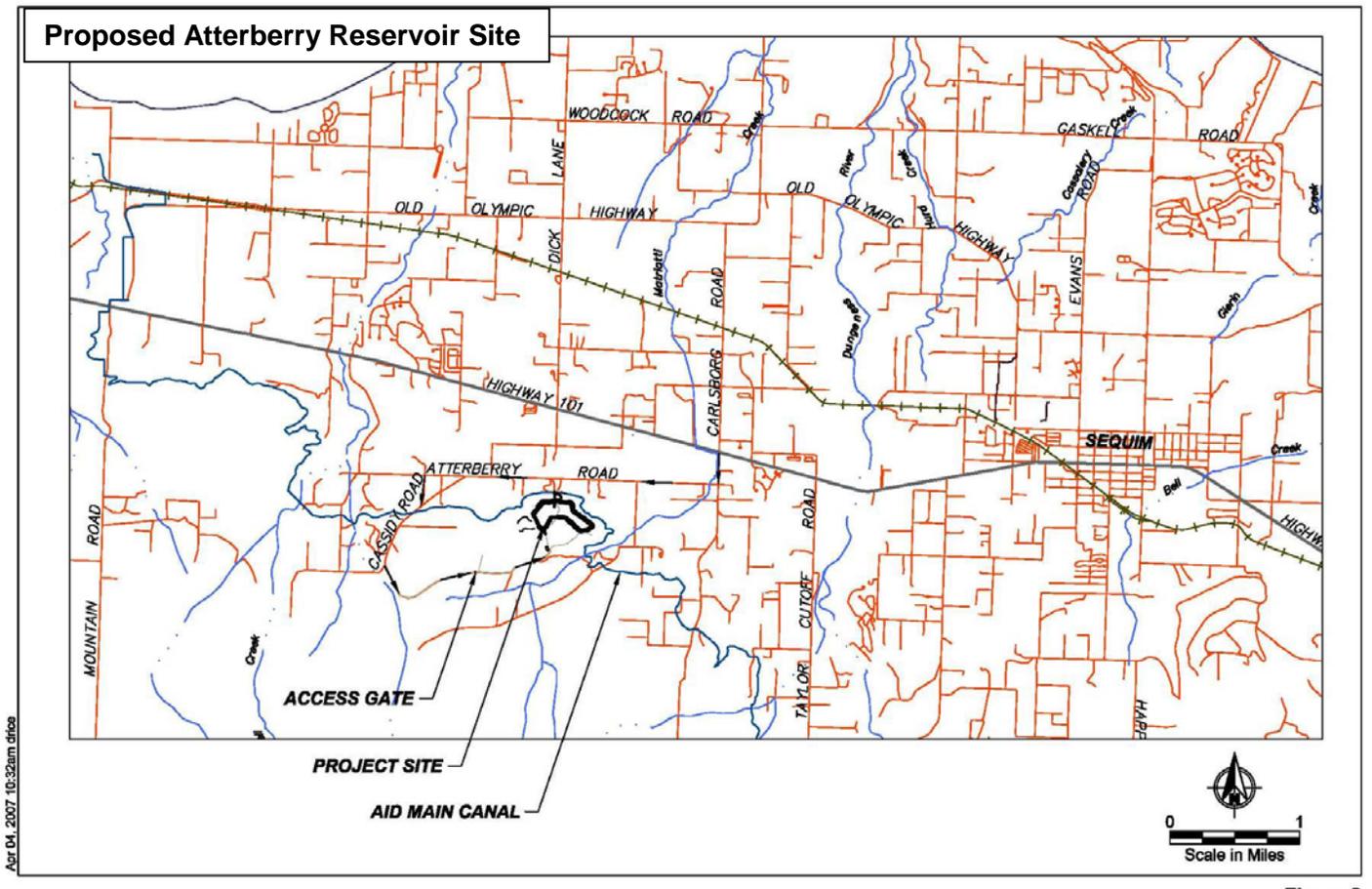
The Dungeness Water Management rule (<http://www.ecy.wa.gov/programs/wr/instream-flows/dungeness.html>) was put into place to maintain or improve stream flows in the watershed, protect senior water rights, and establish a mechanism to mitigate new water uses. The rule, which went into effect January 2, 2013, affects new permit exempt well uses, as well as new uses of existing wells. For example, new exempt well owners will be required to pay a mitigation fee when applying for a building permit, and depending on a variety of factors, may be prohibited from using water for outdoor uses such as irrigation and providing stock water for horses and livestock. Finding ways to more efficiently use limited water resources, including capturing and storing runoff and water efficient landscaping will be imperative.

Shallow aquifer recharge (SAR) is being pursued as a method of storing seasonally high Dungeness River flows. By recharging the shallow aquifer in late spring and early summer, stream flows later in the summer and early fall will be maintained at higher levels. Clallam County conducted the following SAR feasibility study in 2009: [http://www.clallam.net/environment/assets/applets/ASR\\_Report\\_July31.pdf](http://www.clallam.net/environment/assets/applets/ASR_Report_July31.pdf).

Small and large off-channel reservoirs also present opportunities for capturing and storing high flows. Engineering and design work was completed in 2007 for a 506 acre-foot reservoir on over 32 acres of Department of Natural Resources property south of Atterberry Road, above the Agnew Irrigation District main canal (see map below). The Atterberry Reservoir could supply up to eight cfs of water for one month. Construction, permitting, engineering and project management costs were estimated to be over \$9 million. Annual operation and maintenance costs, including approximately \$30,000 to lease the property from the DNR and over \$4,000 for pumping water into the reservoir, are estimated to exceed \$40,000.

For comparison purposes, annual late-season irrigation water leases cost as little as \$400 per acre-foot per year, not including negotiation and administration of the leases. At that rate, it would take an estimated 45 years to pay back construction costs of the Atterberry Reservoir, not including annual operation and maintenance costs of about \$80 per acre foot.

Stormwater and combined sewer overflows are a significant resource concerns in the City of Port Angeles. However, there are few documented impacts from stormwater elsewhere in the county.



## **WRIA 19 Land Use Description**

Approximately 4,500 people live in WRIA 19. Clallam Bay and Neah Bay are the densest population centers; however, over half the people in the WRIA live in the Joyce area. The Makah Reservation totals about 9,234 acres of land in the northwestern tip of the WRIA 19. From 2000 to 2010, the population of the Crescent School District centered on Joyce, area grew by 8.63 percent. The population of the Cape Flattery School District, which includes the communities of Clallam Bay, Sekiu, and Neah Bay, declined by 5.84 percent.

Commercial timber is the prominent land use in the WRIA. 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.

Agriculture in WRIA 19 is mostly in the eastern portion of WRIA 19, in the Salt Creek Basin, an area of glacial outwash that drains a series of low hills. The tax assessor information shows there are about 61 different property owners that have agricultural open space designation on their land, for a total of 1,916 acres, or less than 1% of the WRIA. There are at least two small organic producers located in the Salt Creek area, one of which is a Community Supported Agriculture (CSA) farm.

The extreme eastern portion of WRIA 19 around the Joyce area is the only area that has experienced population growth in recent years. Due to its proximity to Port Angeles, it will likely continue to experience population growth.

## **WRIA 19 Major Natural Resource Issues and Opportunities**

Numerous small, independent streams drain to the Strait of Juan de Fuca in WRIA 19, the most prominent of which are Salt Creek, Lyre River, East Twin River, West Twin River, Deep Creek, Pysht River, Clallam River, Hoko River, and the Sekiu River. Lake Crescent is also in WRIA 19. Bull trout, a threatened species, is present throughout the WRIA. The combination of forest roads for timber production and state and county roads crossing the numerous streams

contribute to abundant culverts that are barriers to fish passage. In addition, numerous streams are classified as impaired due to high water temperatures and sedimentation. These water quality 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.

## **WRIA 20 Land Use Description**

Forks is the only incorporated city within WRIA 20. The city covers a land area of 3.1 square miles and the population of 3,500 is unchanged from 2003; however, the population of the Quillayute Valley School District, which includes the unincorporated areas increased by 0.8 percent from 2000 to 2010.

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. Olympic National Park makes up 127,299 acres, or 25.4% of WRIA 20.

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. This is 31.6% of the land area in the WRIA.

Much of the initial agricultural settlement of the area was located around the Forks prairie, where lack of trees and fertile soil made farming a viable option. Today, agriculture in WRIA 20 is sparse. Approximately 119 parcels totaling 1,776 acres are classified as Open Space Agriculture according to the 2006 Tax Assessor's records.

Like many of the 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.

## **WRIA 20 Major Natural Resource Issues and Opportunities**

Major water bodies of WRIA 20 include the Sol Duc, Calawah, Bogachiel, Dickey and Quillayute rivers, and Lake Ozette and Lake Pleasant. 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 issue in WRIA 20, and numerous streams are classified as impaired due to high water temperatures.