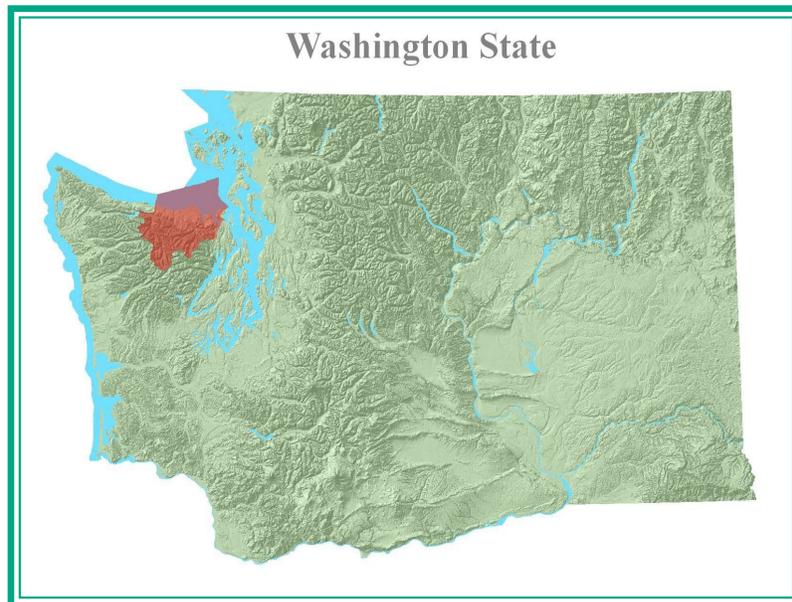


Dungeness-Elwha Watershed

HUC: 17110020

Rapid Watershed Assessment



This assessment involves the collection of quantitative and qualitative information to develop a watershed profile, sufficient analysis of that information to make qualitative statements as to resource concerns and conditions, and the generation of information with which to make decisions about conservation needs and recommendations. These assessments are conducted through the use of Geographic Information System (GIS) technology and by conservation planning teams working within the watershed, meeting with landowners and conservation groups, inventorying agricultural areas, assessing current levels of resource management, identifying conservation recommendations and, making qualitative estimates of the impacts of conservation on local resource concerns.

September 25, 2006

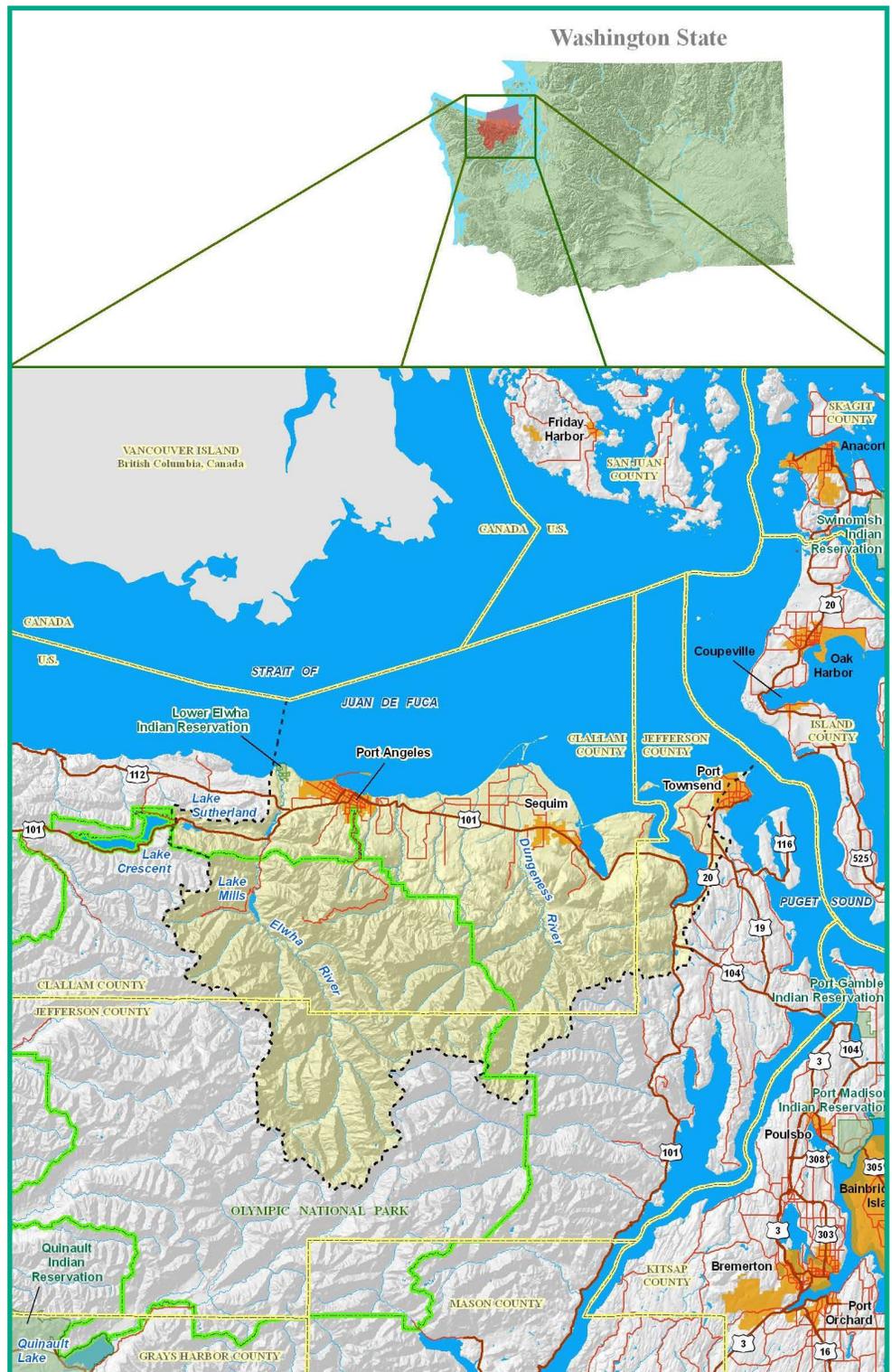
The Dungeness River Watershed is located in the northwest corner of Washington State, on the northeast part of the Olympic Peninsula. The Dungeness-Elwha, 8-Digit Hydrologic Unit Code (HUC) subbasin is 807,954 acres in size. The watershed is 25% privately owned and 75% publicly owned.

The majority of the watershed is forest and open water. Cropland is located mostly in the lower elevations with expansion, by land-clearing, into the foothills. Agricultural enterprises include hay, grain, berries, orchard fruits, and grass turf.

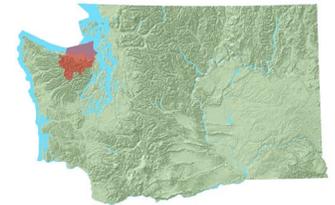
The cities of Sequim and Port Angeles make up the largest urban area in the watershed. Most of the watershed is located in Clallam County, with the upper watershed located in Jefferson County.

Major resource concerns are soil erosion on forest roads, streambank erosion, impaired water quality, forest health issues, invasive weeds, poor pasture condition, and urbanization issues associated with conversion of cropland.

Primary natural resource technical assistance is provided by the Port Angeles NRCS Field Office, Clallam Conservation District, Jefferson Conservation District and the North Olympic Peninsula Resource Conservation and Development Area.



The profile content for the Rapid Watershed Assessments in Washington is outlined in the following five categories:



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- Precipitation
- Land Use / Land Cover
- Common Resource Areas
- Wind Erosion
- Stream Fish Use and Barriers
- Sole Source Aquifers
- Ownership
- Farmland Classification
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 - Population, Ethnicity, Income
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The soils in the watershed are dominated by glacial outwash, till, glaciomarine deposits and alluvium on the lower terraces, outwash plains, and hill slopes and soils that formed in residuum and colluvium from sedimentary rock in uplands and higher mountain slopes. Soils in the uplands and mountain slopes have soil properties typically associated with weathered volcanic ash although tephra may be absent.

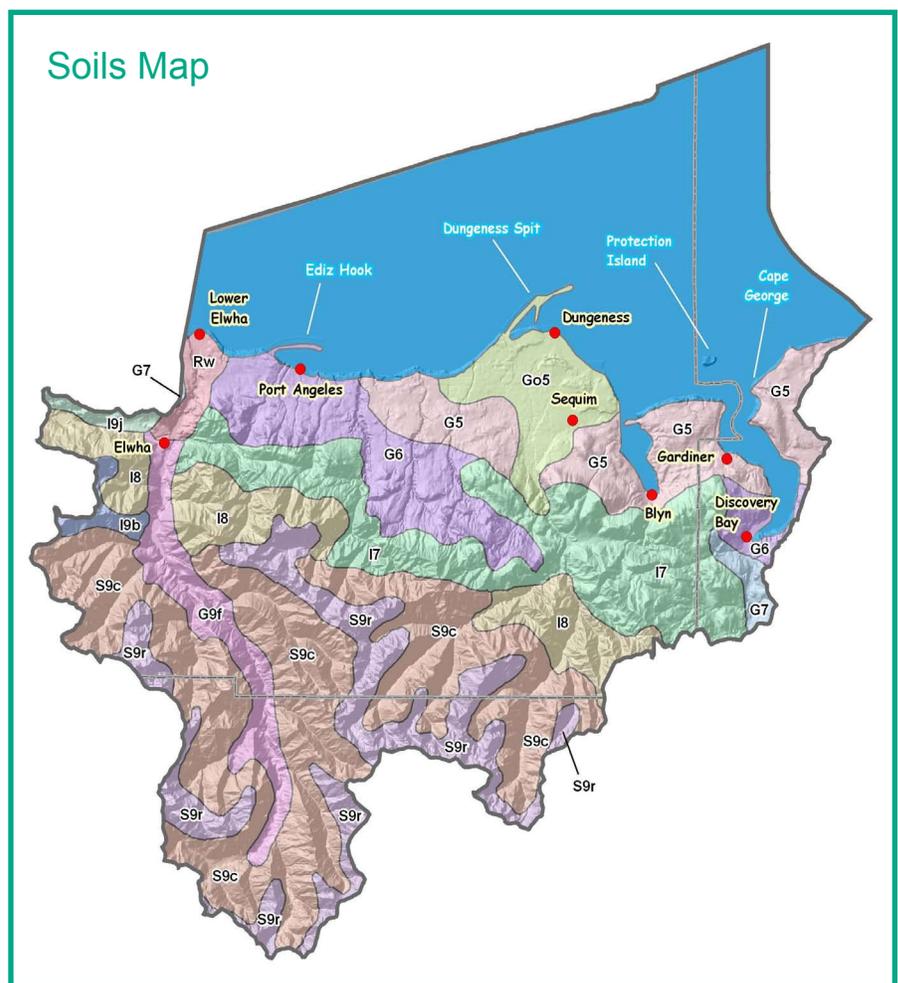
The climate pattern in this watershed provides a low risk of wind erosion although the soils are susceptible to wind and water erosion when surface residue is removed by intensive crop/forest management practices or wildfire in the lower precipitation areas.

G5 - Soils with minimal development; some formed partially under prairie vegetation have dark-colored, humus-rich topsoils. These soils formed in glacial drift, glaciomarine deposits and till. Xeric/Mesic; Whidbey-Catla-Townsend-Coupeville.

G6 - Soils with slight subsoil development. These soils formed in till and glacial outwash. Xeric/Mesic; Elwha-Poulsbo-Ragnar-Clallam.

G7 - Slightly redder and more deeply-weathered than soils in G6. These soils formed in till, glacial outwash, alluvium and lacustrine deposits. Xeric/Mesic; Alderwood-Everett-Harstine-Kitsap-Indianola.

G9f - Cool soils of foothills and mountain valleys that are moist year-round; formed in till, glacial outwash, and colluvium; soils are more red and more deeply-weathered than soils in G8; many have subsoil accumulations of compounds of iron, aluminum and humus; the soils contain amorphous materials and have soil properties typically associated with weathered volcanic ash although tephra may be absent. Udic to Xeric/Frigid to Mesic; Philippa-Diobsud-Skykomish-Elwell-Olomount-Montborne.





Go5 - Weakly-developed soils; formed in glacial outwash and alluvium, some have subsoil accumulations of iron, aluminum, and humus; some soils that developed partially under fern-prairie vegetation have dark-colored, humus-rich topsoils. Xeric/Mesic; Hoypus-Sequim-Carlsborg.

I7 - Soils on mountainsides and hills; formed in residuum and colluvium from sandstone, siltstone and conglomerate, some have dark-colored, base-rich topsoils. Xeric/Mesic to Frigid; Terbies-Olete-Louella.

I8 - Soils on mountainsides and hills; some have soil properties typically associated with weathered volcanic ash although tephra may be absent. Xeric/Mesic to Frigid; No series mapped.

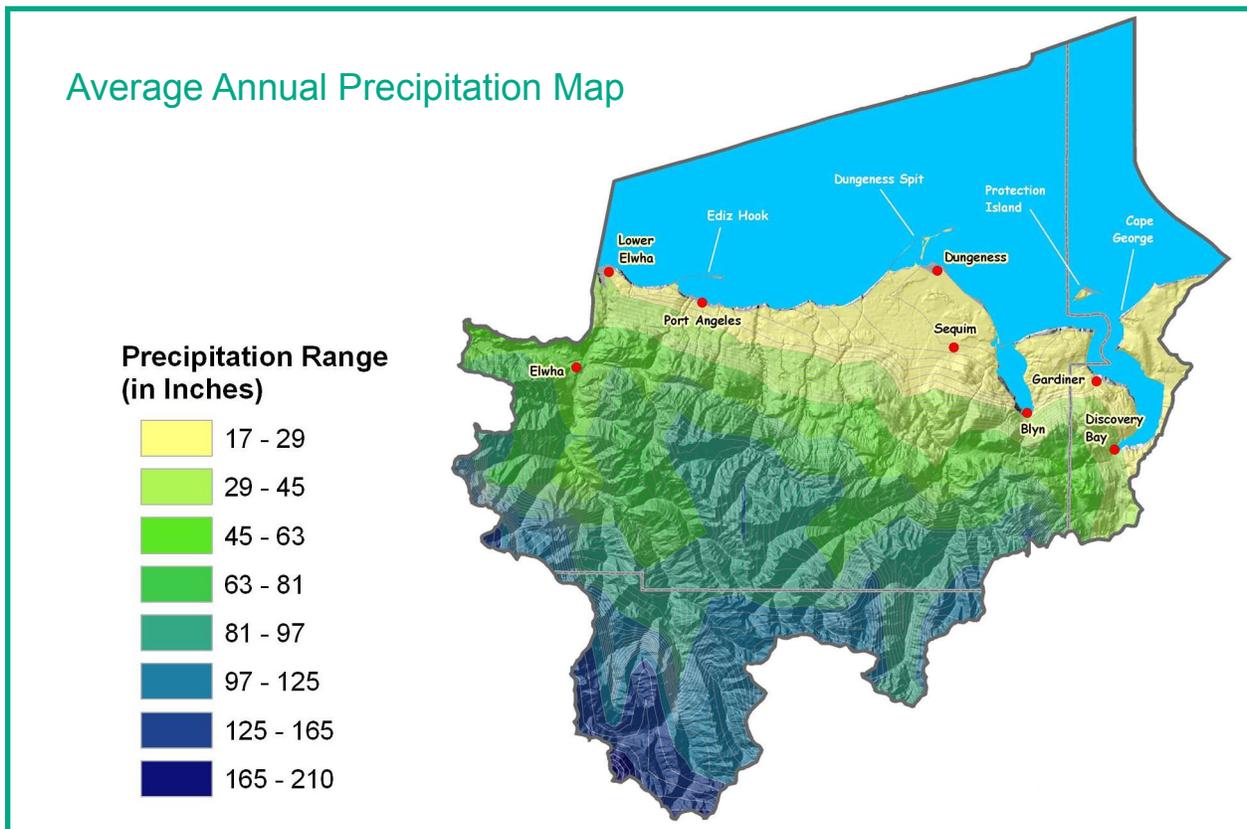
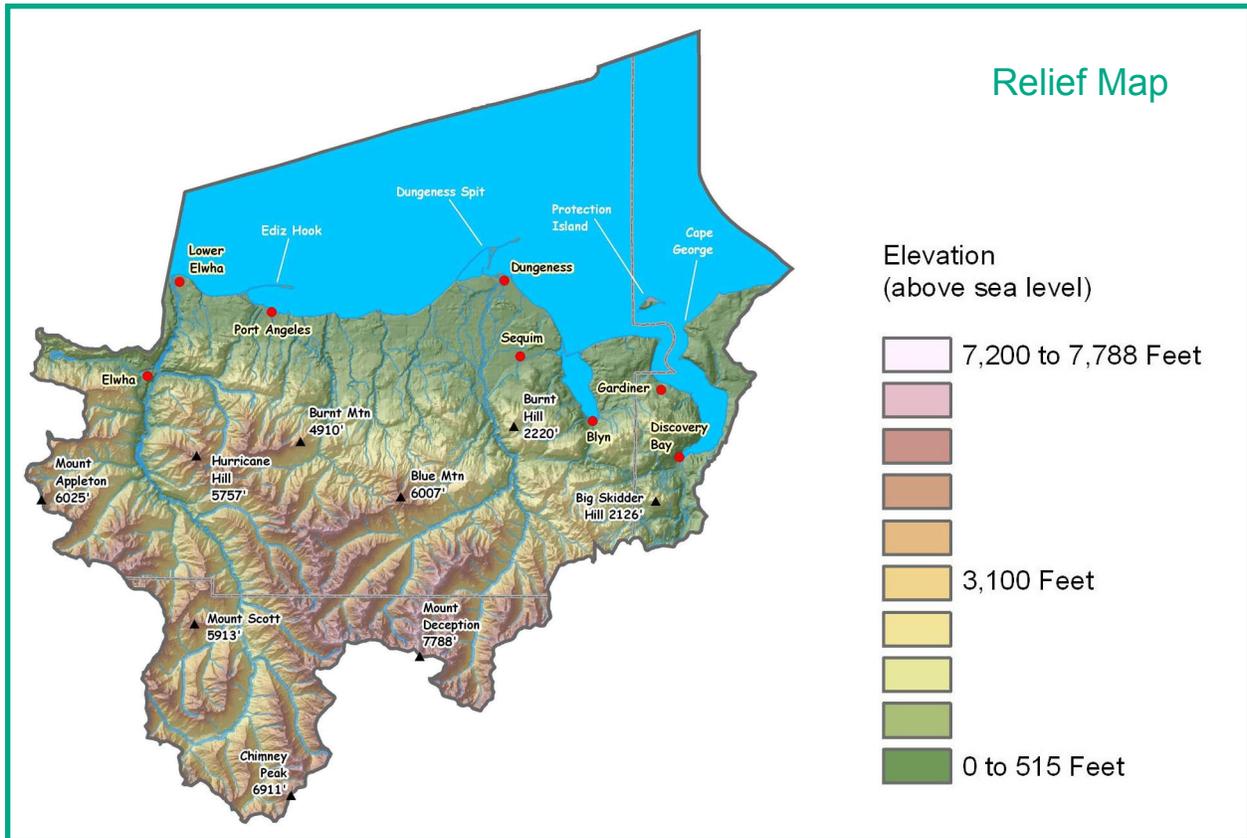
I9b - Dark-colored, humus-rich, deep soils that formed residuum and colluvium from basalt, moist year-round and have soil properties typically associated with weathered volcanic ash although tephra may be absent. Udic/Mesic-Frigid; Bunker-Zyzyl-Knappton-Boistfort-Makah.

I9j - Dark-colored, humus-rich, deep soils that formed in residuum and colluvium from sedimentary rocks; soils are moist year-round and have properties typically associated with weathered volcanic ash although tephra may be absent. Udic/Mesic; Lytell-Zenker-Astoria-Elochoman-Snahopish-Solleks.

Rw - Well- to excessively-drained soils; formed in alluvium; most have a dry season when irrigation is needed for agricultural production. Xeric to Aquic/Mesic; Skagit-Puget-Puyallup-Chehalis-Caples-Oridia.

S9c - Cold soils on mountains that have formed under subalpine forest vegetation with 70-210 inches of M.A.P., formed in till, residuum and colluvium from basalt and conglomerate. Udic/Cryic; Litchy-Weatherwax-Discovery-Fricaba-Skinwood-Waketick.

S9r - Rock Outcrop, snowfields, and very cold alpine meadow soils with 210-240 inches of M.A.P. Udic/Cryic; no series mapped.



Physical Descriptions

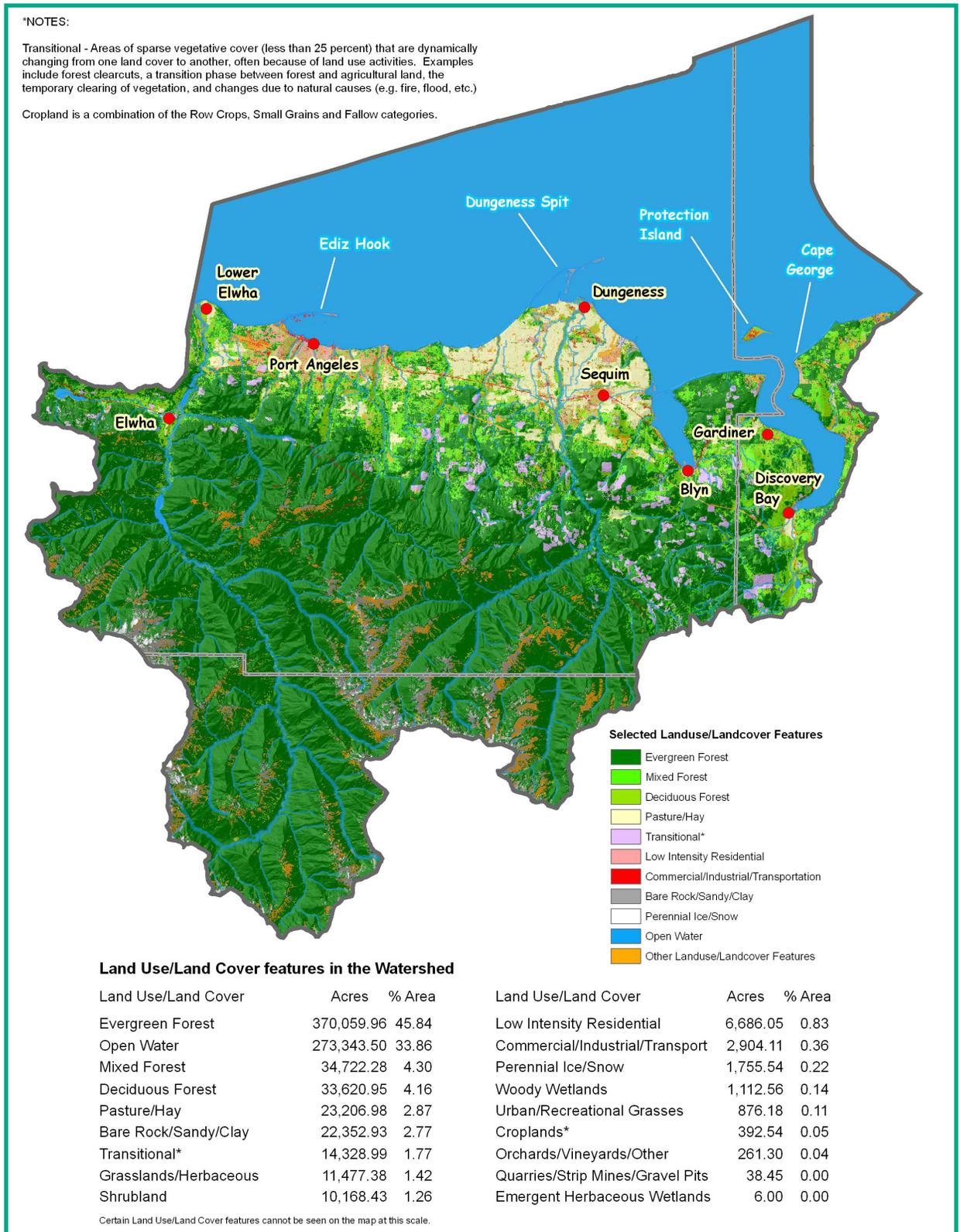
Land Use / Land Cover ⁵

Dungeness - Elwha Watershed
 807,954 Total Acres
 HUC# 17110020

Landuse is a term used for a designation of a land area. NRCS uses official designations, based on use, such as cropland, forestland and pastureland. The Dungeness/Elwha watershed maps shows the primary landuse designations; Evergreen Forest, Open Water, Mixed Forest, Deciduous Forest and Pasture/Hay.

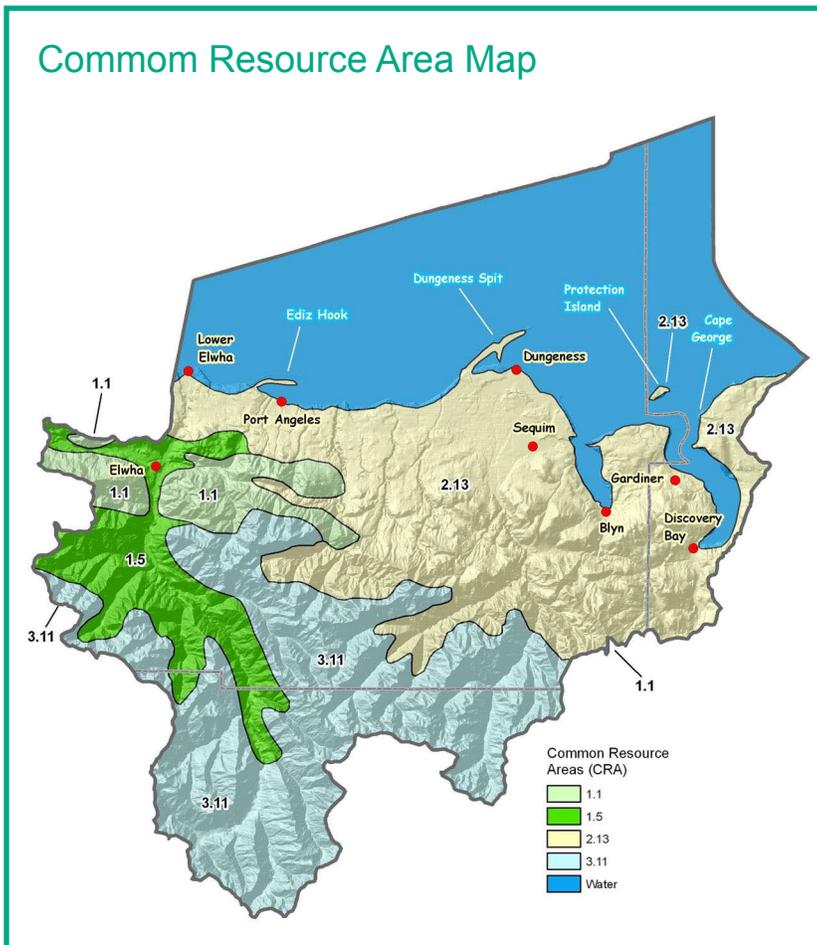
These 5 major landuses make up 91% of the watershed.

Minor landuses are displayed in the table.





Common Resource Area Map



1.1 - Northern Pacific Coast Range, Foothills, and Valleys – Volcanic.

This unit is comprised of mountains having basalt bedrock outside of the “fog belt”. Temperature regime is mesic, frigid and small area of cryic. The moisture regime is udic. Vegetation is Douglas-fir and western hemlock.

1.5 - Northern Pacific Coast Range, Foothills, and Valleys - Low Olympics.

This unit consists of foothills and mountains that rise to an elevation of approximately 4,000 feet. Copious precipitation (up to 200 inches/year) supports a lush rainforest of western hemlock, western red cedar, and Douglas-fir. Much of the area is in the third rotation of timber harvest. However, a portion of the unit

lies within the Olympic National Park and contains old growth forests. Forestry, recreation, some rural residential development.

2.13 - Willamette and Puget Valleys - Olympic Rain shadow. This unit is in the rain shadow of the Olympic Mountains and receives, on the average, 10 to 30 inches of annual precipitation. Streams on the till plains have low discharge, and their drainage pattern is often deranged or internal. Its loamy soils tend to retain more moisture than the soils of the San Juan Islands CRA and support pastureland, cropland, and woodland dominated by Douglas-fir. Forestry, rural residential development.

3.11 – Olympic and Cascade Mountains - High Olympics. This unit contains of steep, glaciated mountains that reach an elevation of 8,000 feet. It is characterized by rock outcrops, tarns, and persistent snow pack, alpine glaciers, and high-gradient, glacial-fed streams. Its vegetation includes sub alpine fir, mountain hemlock and Pacific silver fir forests as well as alpine meadows. Sub alpine fir occurs on the xeric soils of northeastern rain shadow areas. Forests with wilderness recreational activity occurring. The land is mostly publicly owned and is a regional water source.

Physical Descriptions

Streams, Fish Species and Passage Barriers ^{7,8,9,18,19}

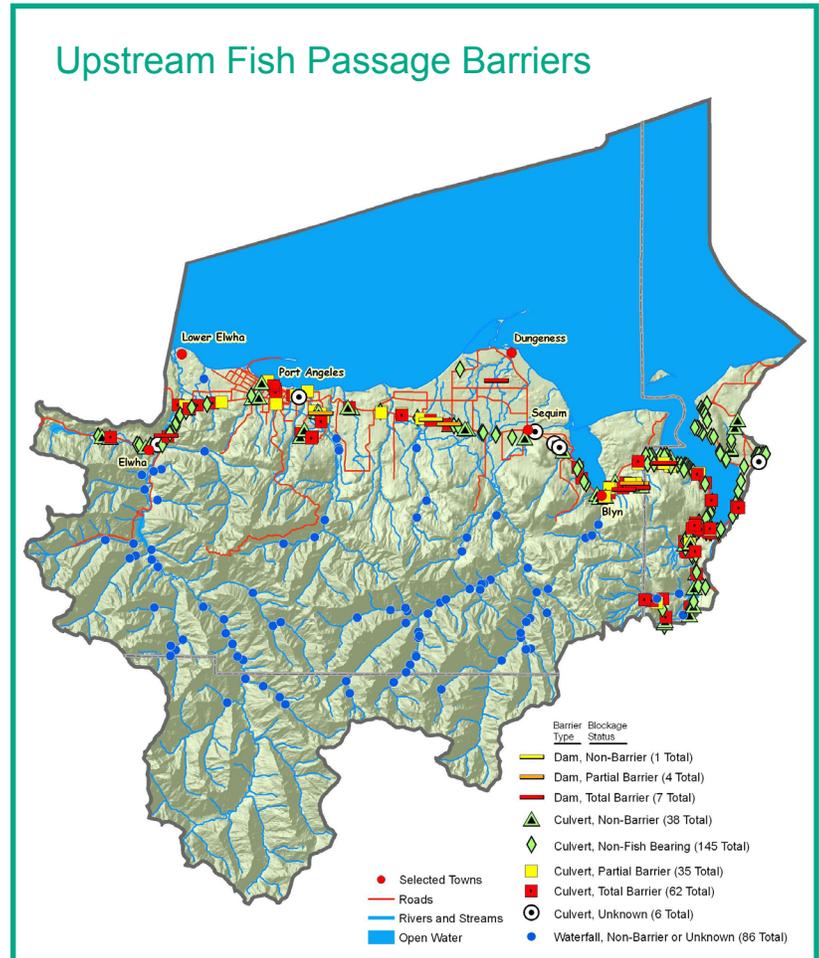
Dungeness - Elwha Watershed

807,954 Total Acres

HUC# 17110020

Statewide - these fish groups are exotic (introduced): catfish, spiny-rays (perch, sunfish, bass), pike, shad, mosquitofish, killifish, weatherfish, striped bass, goby.

Fish Species Found in the Dungeness-Elwha Watershed		
Fish Group	Native	Exotic
Burbot (freshwater cod)		
Catfish		
Goby		
Killifish		
Lamprey	1	
Minnow, carp	1	
Mosquitofish		
Mudminnow		
Perch, walleye		
Pike, pickerel, muskellunge		
Salmonid (anadromous)	7	
Salmonid (resident)	2	
Sand roller		
Sculpin	2	
Shad		
Shiner perch	1	
Smelt	1	
Starry flounder	1	
Stickleback	1	
Striped bass		
Sturgeon	2	
Sucker		
Sunfish, bass, crappie		1
Weatherfish		
Watershed Total	19	1
Statewide Total	53	41

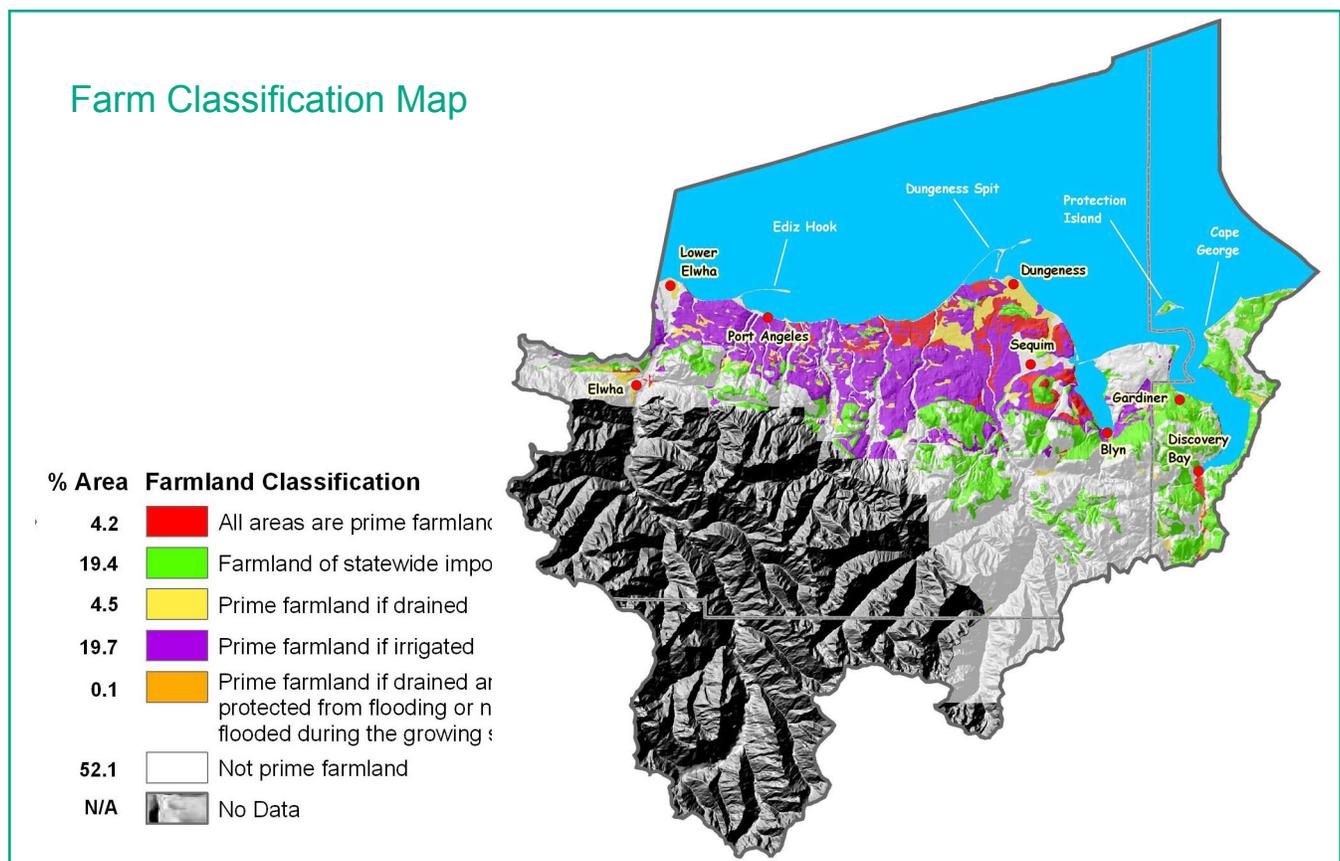
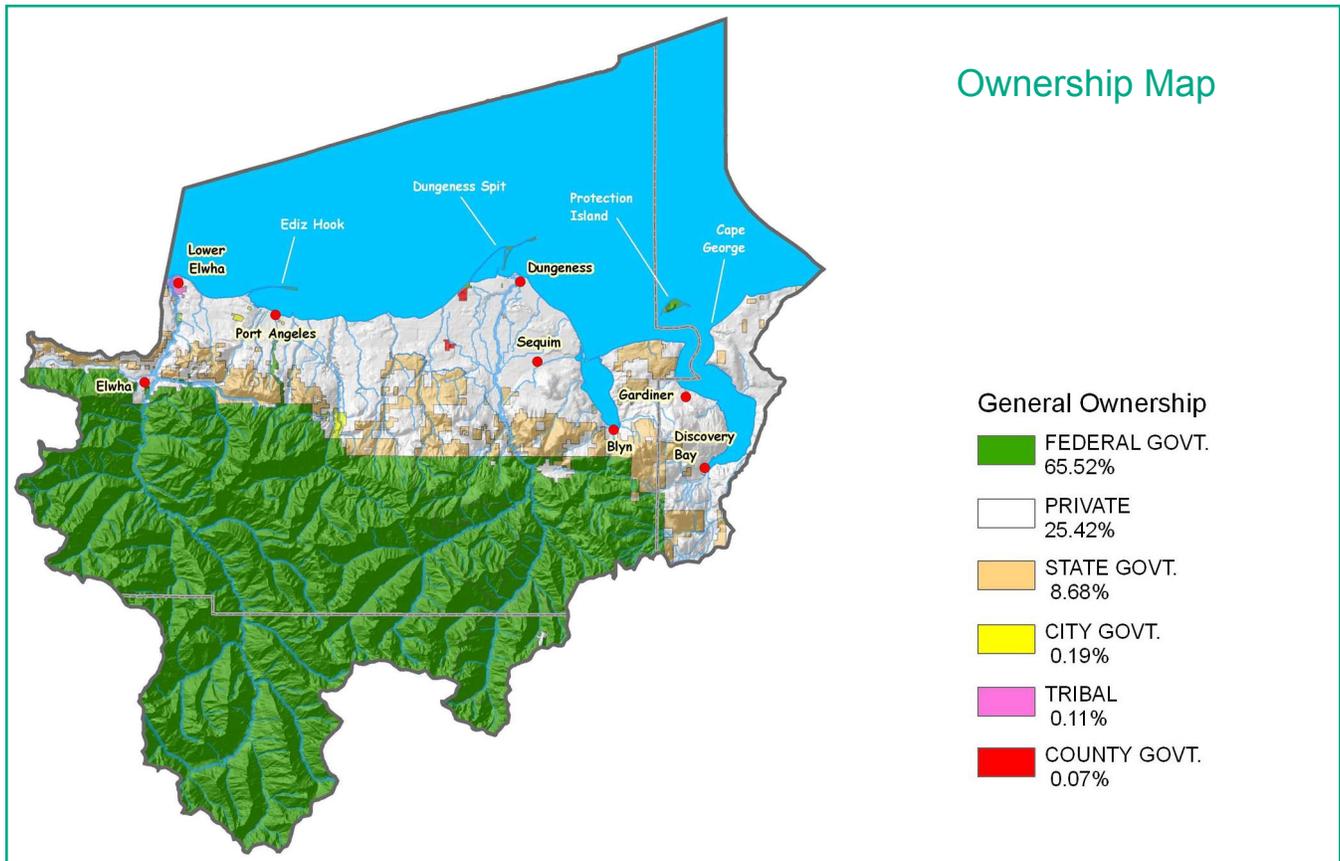


Stream Statistics for the Dungeness-Elwha Watershed	
Total streams	228
Named streams	105
Total stream miles	730
Intermittent miles	48
Intermittent miles %	6

Salmonid (resident) - Native: rainbow, bull trout.

Salmonid (anadromous) - steelhead, coastal cutthroat trout; Chinook, pink, chum, coho salmon; Dolly Varden.

One of two watersheds with no suckers.

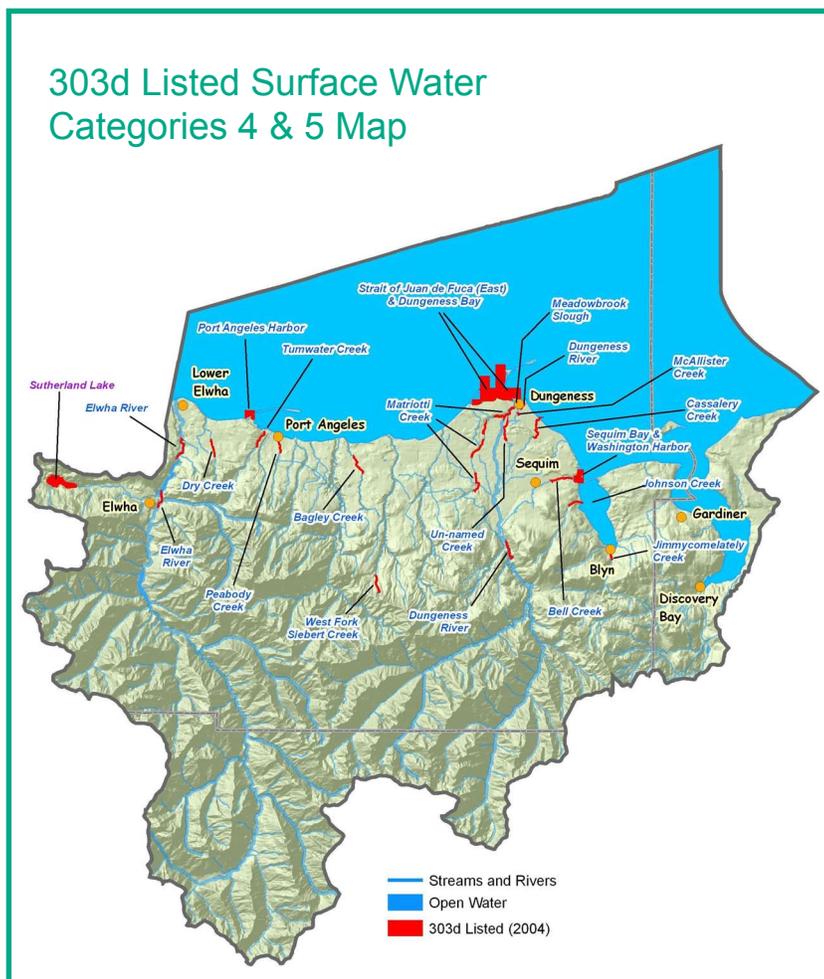




Section 303(d) of the federal Clean Water Act requires Washington State periodically to prepare a list of all surface waters in the state for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. These are water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards, and are not expected to improve within the next two years.

Waters placed on the 303(d) list require the preparation of Total Maximum Daily Loads (TMDLs), a key tool in the work to clean up polluted waters. TMDLs identify the maximum amount of a pollutant to be allowed to be released into a waterbody so as not to impair uses of the water, and allocate that amount among various sources. In addition, even before a TMDL is completed, the inclusion of a water body on the 303(d) list can reduce the amount of pollutants allowed to be released under permits issued by Ecology.

Washington State’s Water Quality Assessment lists the status of water quality for a particular location in one of 5 categories recommended by EPA. Categories 1 – 4 represent the status of waters for the 305(b) Report, while Category 5 represents those waters placed on the 303(d) list.



1. Category 4: Polluted waters that do not require a TMDL is for waters that have pollution problems that are being solved in one of three ways.

Category 4a “has a TMDL” is for water bodies that have an approved TMDL in place and are actively being implemented.

Category 4b “has a pollution control plan” is for water bodies that have a plan in place that is expected to solve the pollution problems. While pollution control plans are not TMDLs, they must have many of the same features and there must be some legal or financial guarantee that they will be implemented.

(303d Listed Surface water definitions continued on next page.)

Physical Descriptions

303d Listed Surface Water

Dungeness - Elwha Watershed
 807,954 Total Acrea
 HUC# 17110020



Category 4c “is impaired by a non-pollutant” is for water bodies impaired by causes that cannot be addressed through a TMDL. These impairments include low water flow, stream channelization, and dams. These problems require complex solutions to help restore streams to more natural conditions.

- Category 5:** Polluted waters that require a TMDL. The 303(d) list is the traditional list of impaired water bodies. Placement in this category means that Washington State Department of Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. TMDLs are required for the water bodies in this category.

303d Listed Streams and Surface Waters

Water Body	Fecal Coliform	Temp	Dissolved Oxygen	pH	Total Phosphorus	Exotic Invasive Species	Ammonia-N	Total PCBs	Mercury	Bio-assessment	In-stream Flow	Fish Habitat
Sutherland Lake	x				x	x						
Elwha River	x	x	x	x			x	x	x			
Dry Creek		x										
Tumwater Creek	x											
Port Angeles Harbor		x	x	x								
Peabody Creek	x	x		x						x		
Bagley Creek	x	x	x	x						x		
West Fork Siebert Creek			x							x		
Matriotti Creek	x											
Dungeness River	x									x	x	
Un-named Creek	x											
McAllister Creek	x											
Meadowbrook Slough	x											
Cassalery Creek	x	x	x	x						x		
Bell Creek	x	x	x	x						x		
Johnson Creek	x	x		x						x		
Jimmycomelately Creek	x	x	x	x			x			x		
Sequim Bay	x											
Washington Harbor												x
Strait of Juan de Fuca (East)	x											
Dungeness Bay	x											x

Physical Descriptions

Riparian Land Use / Land Cover ⁵

Dungeness - Elwha Watershed
 807,954 Total Acres
 HUC# 17110020

The current condition and quality of riparian areas adjacent to water bodies is often times dependent on the land use and land cover characteristics.



This data set is based on a riparian width of 100 feet on each side of all streams in the watershed.

Riparian Land Use / Land Cover

Land Cover/Use		
Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer	ACRES	% of Buffer Area
Bare Rock/Sand/Clay	249	1.3%
Commercial/Industrial/Transportation	94	0.5%
Deciduous Forest	1,723	9.0%
Emergent Herbaceous	2	0.0%
Evergreen Forest	12,583	65.6%
Grasslands/Herbaceous	200	1.0%
Low Intensity Residential	198	1.0%
Mixed Forest	1,889	9.9%
Open Water	470	2.5%
Orchards/Vineyards/Other	3	0.0%
Pasture/Hay	705	3.7%
Perennial Ice/Snow	18	0.1%
Shrubland	374	2.0%
Small Grains	7	0.0%
Transitional	402	2.1%
Urban/Recreational Grasses	16	0.1%
Woody Wetlands	242	1.3%
Total Acres of 100-Foot Stream Buffers	19,175	100.0%

Physical Descriptions

Irrigated Cropland, Hayland and Pastureland ¹⁴

Dungeness - Elwha Watershed
807,954 Total Acrea
HUC# 17110020

The Natural Resource Inventory (NRI) of 1997 was used to estimate acres of irrigated and cultivated cropland, uncultivated cropland (hayland) and pastureland in the watershed.



These estimates were then verified by the Port Angeles office staffs.

Irrigated Lands <i>(1997 NRI ³ Estimates for Non-Federal Lands Only)</i>			
Type of Land	ACRES	Percent of Irrigated Lands	Percent of HUC
Cultivated Cropland	0	0%	0%
Uncultivated Cropland	2,700	36%	<1%
Pastureland	4,700	64%	<1%
Total Irrigated Lands	7,400	100%	0%



Cultural resources are important to most residents in the watershed.

By definition, cultural resources are considered equivalent to “historic properties” as defined in the National Historic Preservation Act. They include any prehistoric or historic district, site, building, structure or object listed in or eligible for listing in the National Register of Historic Places (maintained by the Secretary of the Interior). They also include all records, artifacts and physical remains associated with the historic properties. They may consist of the traces of all of the past activities and accomplishments of people.

Cultural resources that are also protected under other authorities (such as the American Indian Religious Freedom Act) include:

- (1) tangible traces such as districts, sites, buildings, structures and objects;
- (2) less tangible traces such as dance forms, aspects of folk life, landscapes, vistas, cultural or religious practices;
- (3) historical documents;
- (4) and some landscapes, vistas, cemeteries (if they have historic or cultural value) and life ways.

Native Americans have fished the waters of the Dungeness River and vicinity since the last Ice Age. Indians thrived on abundant fish and shellfish, basing much of their culture and economy on these rich resources, particularly the multiple runs of salmon. Archaeological excavation near Sequim provides evidence that people inhabited the region as early as 11,000 years ago. The earliest explorers arrived with Vancouver’s expedition in 1792, but did not settle until the next century. Vancouver’s observations indicated that native bands moved between pre-established sites, influenced by the seasons and the availability of food resources.

The first European settlers arrived in Clallam County in the early 1850s, displacing Natives through both disease and forcible dispersal. Early settlement occurred primarily in the Sequim-Dungeness area west of Sequim Bay, where the towns of New Dungeness and Sequim were founded. With the signing of the Point No Point Treaty in 1855, settlers pressed government agents to relocate the S’Klallam peoples from their traditional territory on the northeast Olympic Peninsula. In 1874, the Dungeness S’Klallam band pooled resources and purchased 200 acres on the shoreline of the Strait of Juan de Fuca between the mouths of Cassalery and Gierin creeks, naming the small property Jamestown.

Activities carried out in the watershed by Federal agencies, where the agency has control of the out come, is subject to provisions of the National Historic and Preservation Act. The Act requires Federal agencies to take into account the effects of their undertakings on any cultural resources or historic properties that meet the National Register of Historic Places criteria. Part of this process involves taking action to avoid or minimize harm to eligible resources.

Physical Descriptions

Air Quality, Ground Water and Wind Erosion

Dungeness - Elwha Watershed
807,954 Total Acrea
HUC# 17110020

Resource concerns related to air quality, ground water and wind erosion are not present in this watershed.



The Local Work Group (LWG) has identified the following resource concerns as being the top priority for cost share assistance:



SOIL
Accelerated erosion.
Streambank erosion caused by livestock impact.
WATER
Access roads deliver sediment to fish-bearing streams.
Animal Waste.
CNMP
Groundwater sensitive area.
Heavy use areas stabilization.
Irrigation system.
IWM
On farm Nitrogen Balance is less than 90% of crop removal.
Riparian forest buffer or filter strip needed.
Storage or waste transfer system.
TMDL has been Approved or Under Development.
Livestock have uncontrolled access to riparian areas.
PLANT
Forest stand improvement and/or fuel load reduction practices.
Noxious weeds and/or woody vegetation.
Water Development for proper grazing distribution.
ANIMAL
Fish passage barriers.
Hedgerow plantings, field borders or windbreaks/ shelterbelts for wildlife benefit.

The following Chart shows the listed plant and animal species under the Endangered Species Act (ESA). These species are a resource concern that must be addressed during the planning process. For additional information contact the United States Fish & Wildlife Service (USF&W) and/or the National Marine Fisheries Service (NMFS).



If planned practices will be applied in an area where potential listed species or its designated critical habitat may be affected either positively or negatively, than a Biological Assessment (BA) must be conducted.

Animal and Plant Species Included in the Endangered Species Act for the Dungeness-Elwha Watershed		
Common Name	Scientific Name	Type
<i>Endangered Species</i>		
Short Tailed Albatross	<i>Phoebastria Diomedea albatrus</i>	<i>Bird</i>
<i>Threatened Species</i>		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	<i>Bird</i>
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	<i>Bird</i>
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	<i>Bird</i>

Farm Bill Programs

Performance Results ²⁰

Dungeness - Elwha Watershed

807,954 Total Acres

HUC# 17110020

This section highlights the conservation application that has been reported from FY 2001 through FY 2006. Performance Results System (PRS) data was extracted from PRS reports by year, conservation systems by Hydrologic Unit Code (HUC). HUC reports were not available where NA. For additional information and other performance reports visit: <http://ias.sc.egov.usda.gov/prshome/>.



	FY02	FY03	FY04	FY05	FY06	Total
Conservation Systems						
Total Conservation Systems Planned (acres)	37	0	NA	54	650	741
Total Conservation Systems Applied (acres)	6,315	144	NA	35	770	7,264
Conservation Treatments						
Waste Management (no.)	0	0	0	0	0	0
Buffers (acres)	0	1	0	0	0	1
Erosion Control (tons/year)	0	0	NA	0	0	0
Erosion Control (acres)	0	0	NA	0	0	0
Irrigation Management (acres)	300	0	0	0	120	420
Nutrient Management (acres)	260	0	0	0	0	260
Pest Management (acres)	0	0	0	0	0	0
Prescribed Grazing (acres)	0	0	0	0	0	0
Trees/Shrubs (acres)	4	14	20	10	20	68
Wildlife Habitat (acres)	23	35	0	3	0	61
Wetlands (acres)	0	0	0	2	0	2

This table lists the farm bill program participation in the watershed during the last five years. Data was collected from Conservation Systems Planned using Farm Bill Programs from PRS reports for the hydrologic unit area. NA indicates that the information was not available.

	FY02	FY03	FY04	FY05	FY06	Total
Conservation Systems Planned Using Farm Bill Programs (acres)						
Conservation Reserve Program (CRP)	0	0	0	0	0	0
Conservation Security Program (CSP)	NA	NA	NA	702	0	702.4
Environmental Quality Incentives Program - Ground and Surface Water (EQIP-GSWC)	-	0	0	0	0	0
Environmental Quality Incentives Program (EQIP)	0	0	388	54	28	470
Farmland Protection Program (FPP)	0	0	0	0	0	0
Forestry Incentives Program (FIP)	0	0	0	0	0	0
Grassland Reserve Program (GRP)	-	0	0	0	0	0
Wetlands Reserve Program (WRP)	0	0	34	0	0	34
Wildlife Habitat Incentive Program (WHIP)	37	0	0	0	0	37

There are 455 farms in Clallam County and 207 farms in Jefferson County, the core counties comprising 100% of the agricultural operations in the watershed. An analysis of the 2002 Agricultural Census data by zip code suggests there are 394 agricultural operations in the watershed. Clallam County has 78% of the agricultural operations in the watershed. The county average farm size in the 2002 Census of Agriculture was 49 acres for Clallam and 59 acres for Jefferson.



For Clallam County, the 2002 average market value of agricultural products sold was \$39,050 with a net cash farm income of \$3,176. The Clallam county net cash farm income was 9% of the statewide average. For Jefferson County, the 2002 average market value of agricultural products sold was \$32,232 with a net cash farm income of \$5,881. The Jefferson county net cash farm income was 17% of the statewide average.

The average farm size for Washington State in the 2002 Census of Agriculture was 426 acres with an average market value of agricultural products sold of \$148,327 and an average net cash farm income of \$33,925.

Population Ethnicity by County	Clallam	Jefferson	Washington
White persons, percent, 2004 (a)	91.1%	93.8%	85.3%
Black persons, percent, 2004 (a)	0.8%	0.7%	3.5%
American Indian and Alaska Native persons, percent, 2004 (a)	4.9%	2.3%	1.6%
Asian persons, percent, 2004 (a)	1.3%	1.4%	6.3%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.2%	0.0%	0.5%
Persons reporting two or more races, percent, 2004	1.7%	1.9%	2.9%
Persons of Hispanic or Latino origin, percent, 2004 (b)	3.9%	2.4%	8.5%
White persons, not Hispanic, percent, 2004	87.7%	91.7%	77.5%

Economic Characteristics by County	Clallam		Jefferson		Washington	
	Number	%	Number	%	Number	%
Employed civilian population 16 years and over	24,455		10,865		2,793,722	
OCCUPATION						
Management, professional, and related occupations	7,010	29	3,623	33	993,198	36
Service occupations	4,886	20	1,990	18	416,056	15
Sales and office occupations	5,874	24	2,354	22	723,256	26
Farming, fishing, and forestry occupations	884	4	162	2	43,495	2
Construction, extraction, and maintenance occupations	2,631	11	1,422	13	263,767	9
Production, transportation, and material moving occupations	3,170	13	1,314	12	353,950	13

Reports

Census Data - Economic Characteristics

Dungeness - Elwha Watershed
 807,954 Total Acres
 HUC# 17110020

INDUSTRY	Calallam		Jefferson		Washington	
	Number	%	Number	%	Number	%
Agriculture, forestry, fishing / hunting, and mining	1,478	6	406	4	68,976	3
Construction	2,006	8	1,146	11	194,871	7
Manufacturing	1,578	7	1,127	10	348,646	13
Wholesale trade	648	3	201	2	113,526	4
Retail trade	3,119	13	1,232	11	338,772	12
Transportation and warehousing, and utilities	1,255	5	584	5	150,985	5
Information	385	2	258	2	95,669	3
Finance, insurance, real estate, rental and leasing	1,073	4	392	4	170,622	6
Professional, scientific, management, administrative, and waste management services	1,593	7	867	8	272,466	10
Educational, health and social services	5,301	22	1,989	18	541,214	19
Arts, entertainment, recreation, accommodation and food services	2,392	10	1,379	13	221,656	8
Other services (except public administration)	1,516	6	572	5	135,379	5
Public administration	2,111	9	712	7	140,940	5
CLASS OF WORKER						
Private wage and salary workers	16,049	66	6,956	64	2,125,029	76
Government workers	5,404	22	2,072	19	459,722	17
Self-employed workers in own not incorporated business	2,896	12	1,766	16	199,827	7
Unpaid family workers	106	0	71	1	9,144	0
INCOME IN 1999						
Households	27,187	100	11,649	100	2,272,261	100
Less than \$10,000	2,877	11	1,073	9	171,863	8
\$10,000 to \$14,999	2,097	8	937	8	124,848	6
\$15,000 to \$24,999	3,950	15	1,740	15	265,131	12
\$25,000 to \$34,999	4,040	15	1,650	14	284,630	13
\$35,000 to \$49,999	5,274	19	2,078	18	389,434	17
\$50,000 to \$74,999	5,318	20	2,218	19	486,392	21
\$75,000 to \$99,999	2,033	8	991	9	264,498	12
\$100,000 to \$149,999	926	3	636	6	188,513	8
\$150,000 to \$199,999	365	1	187	2	47,615	2
\$200,000 or more	307	1	139	1	49,337	2
Median household income (dollars)	36,449	0	37,869	0	45,776	0



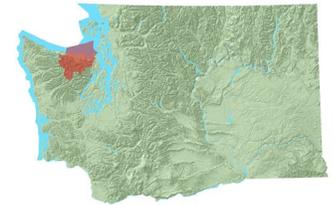
2002 AG CENSUS DATA	Clallam	Jefferson
Farms (number)	455	207
Land in farms (acres)	22,372	12,274
Total cropland (acres)	13,469	5,640
Irrigated land (acres)	4,691	754
Principal operator by primary occupation - Farming (number)	218	119
Principal operator by place of residence - On farm operated (number)	409	183
Farms by Size		
Average size of farm (acres)	49	59
1 to 9 acres	134	49
10 to 49 acres	204	99
50 to 69 acres	43	14
70 to 99 acres	22	9
100 to 139 acres	6	7
140 to 179 acres	15	6
180 to 219 acres	6	8
220 to 259 acres	3	5
260 to 499 acres	19	9
500 to 999 acres	3	1
1,000 to 1,999 acres	0	0
2,000 acres or more	0	0
Livestock and Poultry		
Inventory - Cattle and calves (farms)	186	74
Inventory - Cattle and calves - Beef cows (farms)	149	60
Inventory - Cattle and calves - Milk cows (farms)	17	16
Inventory - Hogs and pigs (farms)	14	0
Inventory - Sheep and lambs (farms)	37	11
Inventory - Layers 20 weeks old and older (farms)	41	28
Inventory - Broilers and other meat-type chickens (farms)	9	4

(Ag sensus data is continued on nextpage.)

Reports

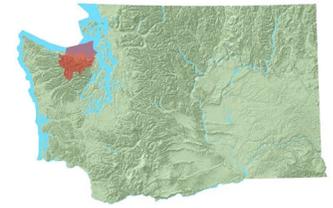
Census Data - Agriculture Data

Dungeness - Elwha Watershed
 807,954 Total Acres
 HUC# 17110020



2002 AG CENSUS DATA cont.	Clallam	Jefferson
Selected Crops Harvested (acres)		
Harvested cropland (acres)	7,763	3,426
Harvested cropland - Irrigated (acres)	3,250	460
Corn for grain (acres)	0	0
Corn for grain - Irrigated (acres)	0	0
Corn for silage or greenchop (acres)	233	0
Corn for silage or greenchop - Irrigated (acres)	233	0
Wheat for grain, all (acres)	0	0
Wheat for grain, all - Irrigated (acres)	0	0
Wheat for grain, all - Winter wheat for grain (acres)	0	0
Wheat for grain, all - Spring wheat for grain (acres)	0	0
Barley for grain (acres)	343	0
Barley for grain - Irrigated (acres)	276	0
Oats for grain (acres)	147	0
Oats for grain - Irrigated (acres)	0	0
Potatoes (acres)	4	0
Sugarbeets for sugar (acres)	0	0
Forage - land used for all hay, haylage, grass silage, and greenchop (acres)	6,405	3,132
Forage - land used for all hay, haylage, grass silage, and greenchop - Irrigated (acres)	2,247	264
Vegetables harvested for sale (acres)	32	28
Land in orchards (acres)	121	51
Land in orchards - Irrigated (acres)	98	45

Many natural resource and socio-economic studies have been conducted in the Dungeness/Elwha watershed. Many of these studies have focused on water quality issues and have been conducted in cooperation with Washington Department of Ecology. In addition, to water quality studies, the U.S. Forest Service, Olympic National Forest address resource needs on National Forest lands within the Dungeness/Elwha Watershed as part of their Forest planning process.



The Olympic National Park also engages in a natural resource planning process to address resource concerns and the Washington Department of Natural Resources conducts studies ranging from road inventories, culvert location and Habitat Conservation Plans. The following list and links are from the Washington Department of Ecology:

WRIA 18, Dungeness-Elwah

Title	Number	Date
Progress on Watershed Planning and Setting Instream Flows	05-11-038	December 2005
Dungeness River and Matriotti Creek Post-Total Maximum Daily Load Data Review	04-03-053	December 2004
Results of a Screening Analysis for Pharmaceuticals in Wastewater Treatment Plant Effluents, Wells, and Creeks in the Sequim-Dungeness Area	04-03-051	November 2004
Clean Water Strategy for addressing Bacteria Pollution in Dungeness Bay and Watershed and Water Cleanup Detailed Implementation Plan	04-10-059	November 2004
Washington State Toxics Monitoring Program: Toxic Contaminants in Fish Tissue and Surface Water in Freshwater Environments, 2002	04-03-040	September 2004
Groundwater Contributions to Siebert Creek (Clallam County) During the Summer of 2003	04-03-021	May 2004
Water Cleanup Plan for Bacteria in Dungeness Bay: Total Maximum Daily Load (TMDL) Submittal Report	04-10-026	April 2004
Dungeness Bay Fecal Coliform Bacteria Total Maximum Daily Load Study	04-03-012	March 2004
Quality Assurance Project Plan: Screening for Pharmaceuticals in Wastewater Treatment Plant Effluents, Groundwater, and Surface Water in the Sequim-Dungeness Area	04-03-104	February 2004
Final EIS - Dungeness River Agricultural Water Users Association Comprehensive Water Conservation Plan	03-11-016	November 2003
Groundwater Quality in the Agnew and Carlsborg area, Clallam County, December 2000 - September 2002	03-03-017	April 2003
VEAT 2002 - Vessel Entries And Transits for Washington Waters	03-08-002	March 2003
Effectiveness Monitoring for Dioxin Total Maximum Daily Loads in Western Washington	03-03-002	January 2003

(Special reports are contunied on the next page.)

Reports

Special Projects

Dungeness - Elwha Watershed
 807,954 Total Acres
 HUC# 17110020

Title	Number	Date
Surface Water-Ground Water Interactions Along the Dungeness River and Vertical Hydraulic Conductivity of Streambed Sediments, Clallam County, Washington, September 1999-July 2001	02-03-027	August 2002
Water Cleanup Plan for Bacteria in the Lower Dungeness Watershed -- Total Maximum Daily Load (TMDL) Submittal Report	02-10-015	June 2002
Dungeness River and Matriotti Creek Fecal Coliform Bacteria Total Maximum Daily Load Study	02-03-014	May 2002
A Comparison of Horizontal Hydraulic Conductivity Values Derived from Aquifer Test and Well Specific-Capacity Data for the Sequim-Dungeness Area	02-03-017	April 2002
Public comments invited on draft plan to clean up lower Dungeness watershed	02-10-016	April 2002
PCBs in Sediments at Selected Sites in Puget Sound	02-03-003	February 2002
Relationship Between the Upper Dungeness River and the Bedrock Aquifer, Clallam County	01-03-027	December 2001
River and Stream Ambient Monitoring Report for Water Year 2000	01-03-042	December 2001
Dungeness River/Matriotti Creek Fecal Coliform Bacteria Total Maximum Daily Load Study Streamflow Summary	01-03-039	November 2001
Dungeness River and Matriotti Creek Total Maximum Daily Load Study: Preliminary Data Results for November 1999 through October 2000	01-03-002	January 2001
Water Quality Assessments of Selected Lakes within Washington State: 1998	00-03-039	December 2000
Focus Sheet: Water cleanup planning in the Dungeness watershed	00-10-016	March 2000
PCB Concentrations in Fish from Ward Lake (Thurston County) and the Lower Elwha River	99-338	September 1999
River and Stream Ambient Monitoring Report for Water Year 1997	99-332	August 1999
Port Angeles Wood Waste Study, Port Angeles, Washington	99-326	1999
River and Stream Ambient Monitoring Report for Wateryear 1996	98-317	1998
Marine Sediment Monitoring Program I - Chemistry and Toxicity Testing. 1989 - 95	98-323	1998
Marine Sediment Monitoring Program II - Distribution and Structure of Benthic Communities in Puget Sound - 1989-1993	98-328	1998
Washington State Marine Water Quality in 1996 and 1997	98-338	1998
River and Stream Ambient Monitoring Report for Wateryear 1995	96-355	1997
Washington State Marine Water Quality in 1994 and 1995	97-316	1997
Watershed Briefing Paper for the Eastern Olympic Watershed Water Quality Management Area	97-336	1997

Footnotes / Bibliographys

All information is provided “as is.” There are no warranties, express or implied, including the warranty of fitness for a particular purpose, accompanying this document. Use for general planning purposes only.



1. Rapid Watershed Assessment (RWA) 8-digit Hydrologic Unit (HU) boundaries are from the U.S. Geological Survey huc250k vector data layer published in 1994. The data is based on the Hydrologic Unit Maps published by the U.S. Geological Survey Office of Water Data Coordination, together with the list descriptions and the name of the region, subregion, accounting unit, and cataloging unit. The hydrologic units are encoded with an eight-digit number that indicates the hydrologic region (first two digits), hydrologic subregion (second two digits), accounting unit (third two digits), and cataloging unit (fourth two digits). The HU data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>. Tribal reservation boundaries are from the Washington State Department of Ecology (WDOE) 1;100,000 scale State Tribal Lands vector data layer. This layer can be downloaded from <http://www.ecy.wa.gov/services/gis/data/data.htm#tribal>.
2. General Soils were derived from the General Soil Map, Washington (1:500,000 scale), by Maureen Boling, Bruce Frazier and Alan Busacca, Washington State University, 1998. The soil map is the product of the combined efforts of Washington State University and its National Cooperative Soil Survey Partners, the USDA Natural Resources Conservation Service and Forest Service. More information visit <http://remotesens.css.wsu.edu/washingtonsoil/index.htm>.
3. The Relief map was created using a seamless, statewide, 30-meter resolution USGS digital elevation model (DEM) raster clipped to the watershed boundary. This DEM was colored to represent relative relief and draped over a 30-meter hillshade grid derived from the statewide DEM to create a 3-D effect. The mountain peaks and town locations are from the 2004 USGS Geographic Names Information System (GNIS) Non-populated Places and Populated Places datasets. The GNIS data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
4. Average Annual Precipitation is from the Parameter-elevation Regressions on Independent Slopes Model (PRISM) raster data. This annual precipitation data is derived from the climatological period of 1961-1990. The PRISM raster data is the underlying dataset from which the polygons and vectors were created. For more information about PRISM visit http://www.ocs.orst.edu/prism/prism_new.html. Precipitation data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
5. The Land Use/Land Cover data was generated from the National Land Cover Dataset (NLCD) compiled from Landsat satellite TM imagery (circa 1992) with a spatial resolution of 30 meters and supplemented by various ancillary data (where available). The data was assembled by the USGS and published in June of 1999. The analysis and interpretation of the satellite imagery was conducted using very large, sometimes multi-state image mosaics. These data can be used in a geographic information system (GIS) for any number of purposes, such as assessing wildlife habitat, water quality, pesticide runoff, land use change, etc. For more information about NLCD visit: <http://landcover.usgs.gov/natl/landcover.php>. The data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>. For more information on Land Use designations, refer to the NRCS Planning Procedures Handbook, March 2003.

Footnotes / Bibliographys

6. Common Resource Area (CRA) Map delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA.
For more information about a CRA visit <http://soils.usda.gov/survey/geography/cra.html>.
7. Fish species distribution for both streams and lakes was obtained by overlaying a clear plastic outline of Washington State, with the chosen watershed highlighted, onto a similar-sized fish-distribution map found for each fish species in the publication, "Inland Fishes of Washington". Wydoski, R. S. and R. R. Whitney. 2003. Inland Fishes of Washington (2nd edition). American Fisheries Society and University of Washington Press. 320 pp. Many fish species are shown as living only in the mainstem Columbia or Snake Rivers. If one of these rivers runs through, or is a boundary of a target watershed, river-borne species were included in the watershed. Likewise, estuary-type fish such as starry flounders, that are often found well upstream from saltwater, are included in most watersheds that drain to salt water.
8. Fish barrier information was downloaded from the SalmonScope website at: (<http://wdfw.wa.gov/mapping/salmonscape/>). This Washington Department of Fish and Wildlife website offers an online source of maps at the 1:24,000 scale for planners to identify and prioritize their stream restoration and protection activities. The site merges fish presence and habitat data collected by state, federal, tribal and local biologists and presents it in an integrated system that can be readily accessed by other agencies and the public. It is part of the larger StreamNet program for Northwestern States.
9. Stream statistics were obtained from 1:100,000 scale StreamNet data layers found at: <http://www.streamnet.org/pnwr/fileaccess.html>. StreamNet (<http://www.streamnet.org/>) is a cooperative venture of the Pacific Northwest's fish and wildlife agencies and tribes and is administered by the Pacific States Marine Fisheries Commission (<http://www.psmfc.org/>). It is recognized that a 100K map scale may show less streams and less stream miles than a 24K map, but it still gives a useful comparison between watersheds.
10. General Ownership is derived from the 1:100,000 scale Washington Public Lands (2005) layer. The layer is comprised of the best available data compiled at 1:100,000 scale. This data layer is a compilation of the Washington State Department of Natural Resources (WDNR) Managed Land Parcels layer and the Washington State Major Public Lands (Non-DNR or NDMPL) layer. The combination of these two data layers is intended to reflect the most current general ownership (and extent of public lands) digital data in Washington State at the 1:100,000 scale. These data layers were downloaded from the WDNR Available GIS Data website: <http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html>. The RWA map describes occurrences within the watershed of land ownership/management areas for federal, tribal, state, local and private entities. For current ownership status, consult official records at appropriate Federal, State, and county offices.

Footnotes / Bibliography

11. Farmland classifications were derived using the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) tabular and spatial data. This information can be referenced through the NRCS Field Office Technical Guide, Section II, Soils: soils data and interpretations databases. The following surveys were used:
 - Clallam County Area., WA (WA609) Published 2004 08 19
 - Jefferson County, WA (WA631) Published 2004 11 18
 - Olympic National Forest, WA (WA632) Published 2004 07 22These surveys and tabular databases were downloaded from the NRCS Soil Data Mart at <http://soildatamart.nrcs.usda.gov>. Farmland classification layers were created using the soil surveys in the NRCS Soil Data Viewer (SDV). Visit the online Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov> for official and current USDA soil information as viewable maps and tables.
12. Washington Department of Ecology:
http://www.ecy.wa.gov/programs/wq/303d/wq_assessment_cats.html. Washington State Water Quality Categories website: <http://apps.ecy.wa.gov/wats/WATSQBHome.asp>.
(In the first drop-down box, click on your WRIA of interest).
13. 303d listed streams were derived from the Washington State Department of Ecology's (WDOE) 2004 Washington Water Quality Assessment/303(d) List. This information was downloaded from the WDOE Statewide Datasets website: <http://www.ecy.wa.gov/services/gis/data/data.htm>.
14. ESTIMATES FROM THE 1997 NRI DATABASE (REVISED DECEMBER 2000) REPLACE ALL PREVIOUS REPORTS AND ESTIMATES. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is because of changes in statistical estimation protocols and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. All definitions are available in the glossary. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000.
For more information: <http://www.nrcs.usda.gov/technical/NRI/>.
15. NRCS General Manual, Part 401 - Cultural Resources (Archeological and Historic Properties)
http://policy.nrcs.usda.gov/scripts/lpsiis.dll/GM/GM_420_401_a.htm
Washington Department of Ecology, Elwha-Dungeness Watershed Plan
Water Resource Inventory Area 18 (WRIA 18) and Sequim Bay in West WRIA 17
http://www.clallam.net/environment/assets/applets/W18d1_2.2-HumanEnv.pdf
16. USFWS website for all federally listed animals and plants in Washington State.
http://ecos.fws.gov/tess_public/StateListing.do?state=WA&status=listed
17. Washington State's Rare Plant Species Populations and Endangered Ecosystems from the Washington Natural Heritage Program WNHP (Current and Historic) Data Set (September 2005). In designing the WNHP Data Set, Washington Natural Heritage Program sought to license and distribute a GIS data set for use in land use planning and management. In order to balance the interests of data users with species protection, the precise locations of rare plant populations are not

Footnotes / Bibliography

included. These locations are instead represented by 'areas-of-concern'. Occurrences of species considered critically imperiled are generalized as larger areas-of-concern polygons. Some known element occurrences have been completely removed from this data set before distribution because information on these elements is considered sensitive at this time. For more information please visit the WNHP website at www.dnr.wa.gov/nhp.

18. ESA-listed bull trout population delineations (termed by USFWS as a DPS, or Distinct Population Segment) were obtained from the following 1:100,000 scale StreamNet data layer: sp1498_Bulltrout_lcc. Similar information can be viewed in the Federal Register publication of the USFWS, 50 CFR Part 17, "Endangered and Threatened Wildlife Plants; Designation of Critical Habitat for the Bull Trout; Final Rule" September 26, 2005; page 56267:
<http://www.fws.gov/pacific/bulltrout/final/pdf/Bull%20Trout%20CH%20FR%20notice.pdf>
19. ESA-listed salmon and steelhead population delineations (termed by NMFS as an ESU, or Evolutionary Significant Unit) were obtained from data layers compiled by a GIS group from the Bonneville Power Administration, using written descriptions in National Marine Fisheries Service (NMFS) status reviews and mapping provided by NMFS. Drainage basin delineation and upstream barriers were based on 1:100,000 stream hydrography and available digital topography (1:250,000). General ESU maps can be found at the NMFS website: <http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Maps/>
20. Performance Results System (PRS) data was extracted from PRS reports by year, conservation systems, and practices by Hydrologic Unit Code (HUC) and Farm Bill Program. HUC level reports were not available where NA is listed. For additional information and other performance reports visit <http://ias.sc.egov.usda.gov/prshome/>.
21. Ag Census data is from the National Agricultural Statistics Service (NASS) Website. For more information on individual census queries visit the NASS website at <http://www.nass.usda.gov/>. HUC specific data was derived from the 2002 Agricultural Census and adjusted by percent of zip code area/county in the HUC.
22. Population ethnicity data were extracted from the Census 2000 Summary File 3 compiled by the U.S. Census Bureau for Stevens County and Washington State. For more information on census data and definitions visit <http://www.census.gov/Press-Release/www/2002/sumfile3.html>.
23. Urban population and median household income data were derived from the American FactFinder assembled by the U.S. Census Bureau. American FactFinder is a quick source for population, housing, income and geographic data.
For other census items and trends visit http://factfinder.census.gov/home/saff/main.html?_lan
24. Washington Department of Ecology website: <http://www.ecy.wa.gov/biblio/wria59.html>
Publications listed by a Watershed Resource Inventory Area, WRIA 18, Elwha- Dungeness

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