United States Department of Agriculture

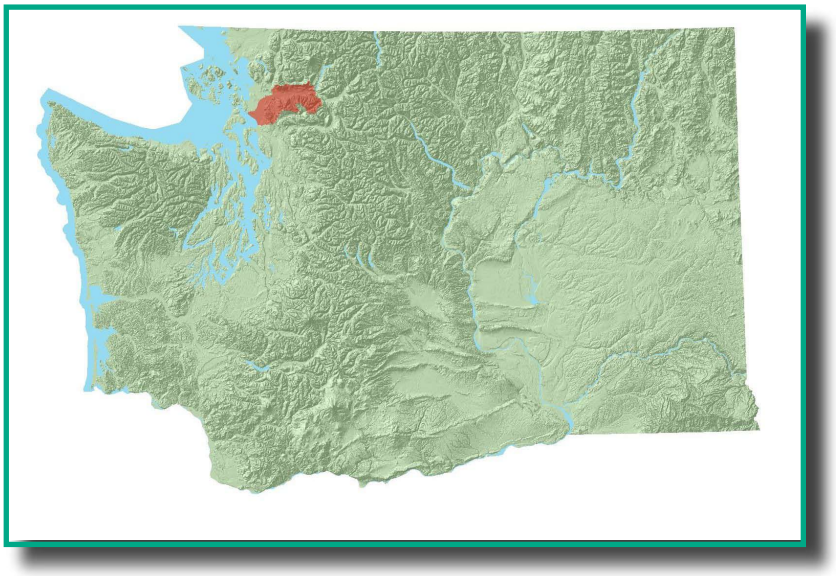
NRCS Natural Resources Conservation Service

Washington

Lower Skagit Watershed

HUC: 17110007

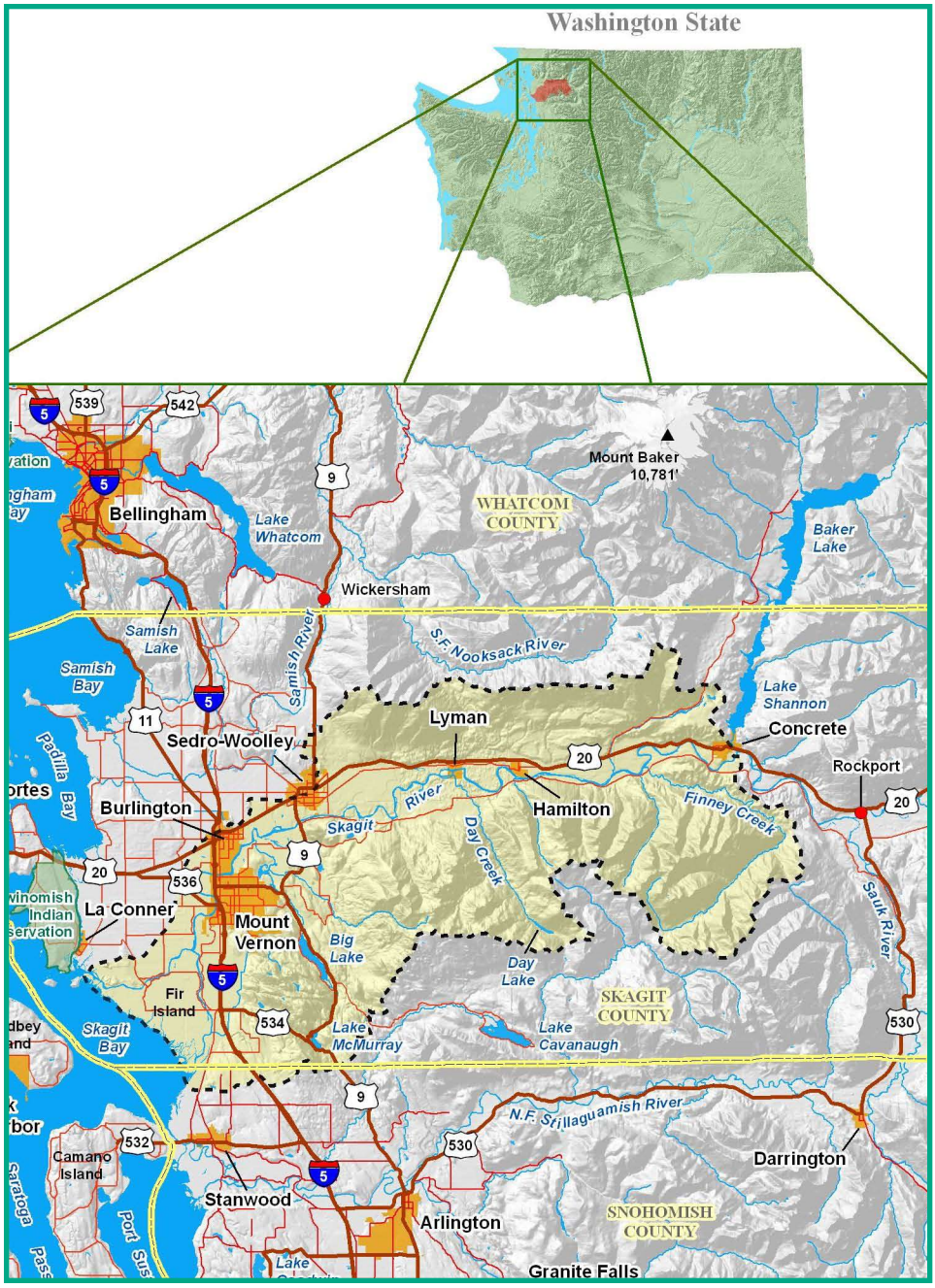
Rapid Watershed Assessment



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.

October 13, 2006

Introduction [1]



This watershed is located in the northwest corner of Washington State. The entire Skagit River basin has a drainage area of approximately 3,093 square miles, which includes its headwaters in British Columbia. It is the largest basin tributary to Puget Sound, and the largest basin in Washington outside the Columbia River.

The Lower Skagit (WIRA 03) is primarily located within Skagit County; however, a small portion of the northwestern part of Snohomish County is also included. This portion of Snohomish County is mostly outside the urban growth area. The primary river draining this watershed is the Skagit River. The lower Skagit hydrologic unit extends from its outlet up to the vicinity of the Town of Concrete.

The principal land uses in the study area are cropland, forestland, and urban and built-up areas. Both dairy farming and row cropping are widespread in the watershed. Other agricultural operations include berries, bulbs and tree nurseries. The three main population centers are Mount Vernon, Burlington, and Sedro-Woolley. Much of the low lying areas are diked and drained, and several pump stations discharge water from the drainage districts into the Skagit River.

The lower Skagit is approximately 284,302 acres in size. The watershed is 71% privately owned and 29% publicly owned. Major resource concerns are streambank erosion, impaired water quality, forest health issues, invasive weeds, and urban encroachment on agricultural areas.

Primary natural resource technical assistance is provided by the Mt. Vernon NRCS Field Office, and Skagit Conservation District.

Content

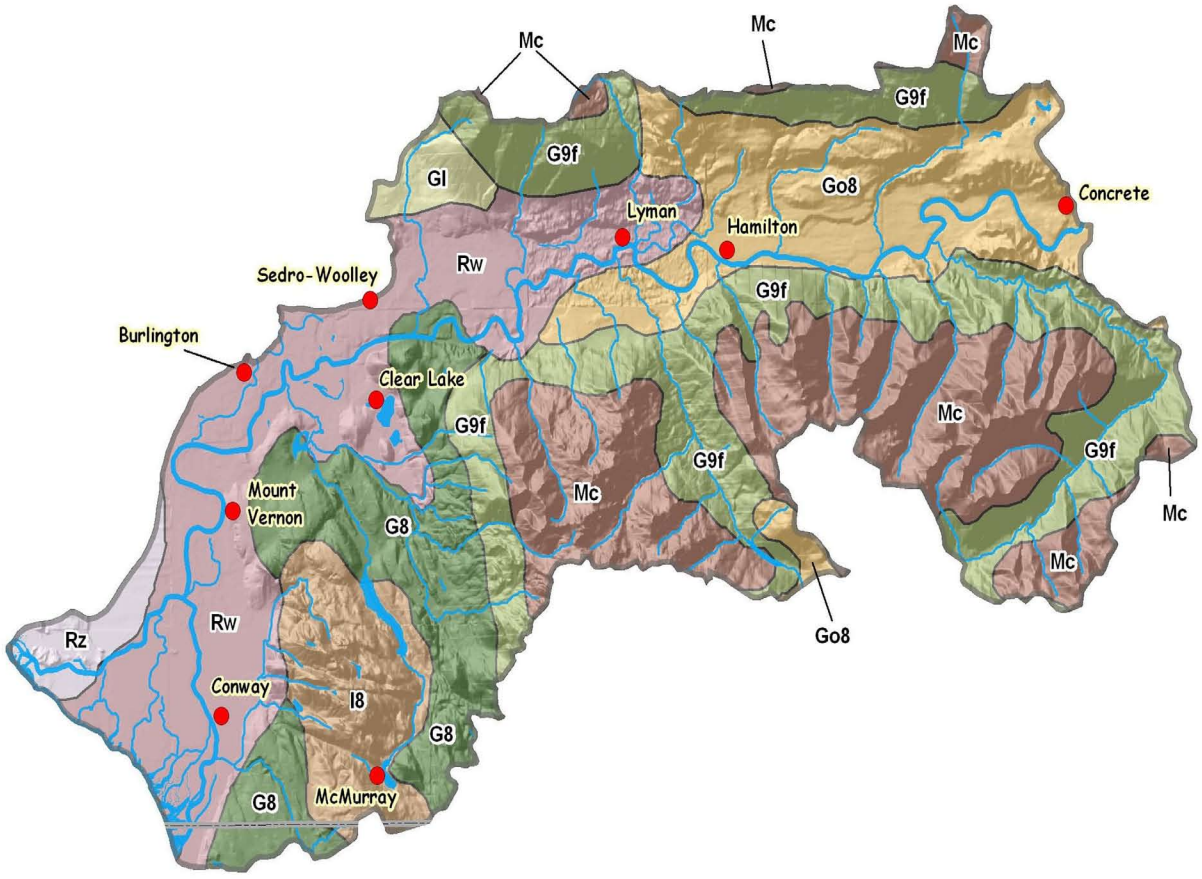
The profile content for the Rapid Watershed Assessments in Washington is outlined in the following five categories:

Content Page

The soils in this watershed are dominantly formed in material that has been influenced by glacial deposits or glacial scour of bedrock. The till can be hard and dense, and loose and unsorted when modified by meltwater. Glaciofluvial sediment transported and deposited by meltwater includes coarse, gravelly and cobbly outwash along stream courses, sandy outwash on outwash plains, and fine sediments in glacial lakes. Floods of fast-moving meltwater deposited thick beds of coarse outwash along stream channels now occupied by the Skagit River. Soils in the higher elevation have a thin veneer of glacial drift and colluvium over bedrock. Thin layers of volcanic ash and loess of varying thicknesses overlie most of the soils. At higher elevations it occurs as discrete surficial layers that are primarily volcanic ash with silty textures.

The climate pattern in this watershed provides a low risk of wind erosion but water erosion can be a concern on steeper slopes and when surface residue is removed by intensive crop/forest management practices or wildfire in the lower precipitation areas.

Soils Map of Lower Skagit Watershed



(Soils narrative continued on next page.)

G8 - Redder and more deeply-weathered than soils in G7; these soils contain amorphous materials and have properties associated with weathered volcanic ash; some have subsoil accumulations of compounds of iron, aluminum and humus. Xeric to Udic/Mesic; Barneston-Shelton-Tokul-Pastik-Ogarty-Mukilteo.

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.

Gl - Moderately well- to poorly-drained soils developed in loess over glaciomarine or glaciolacustrine deposits; some of these soils have subsoil accumulations of compounds of iron, aluminum and humus; some contain amorphous materials and have properties typically associated with weathered volcanic ash; still others have subsoil accumulations of clay. Aquic to Xeric/Mesic; Whatcom-Bow-Skipopa-Labounty.

Go8 - Forest soils with subsoil accumulations of compounds of iron, aluminum and humus; some contain amorphous materials and have properties typically associated with weathered volcanic ash. Xeric/Mesic to Frigid; Barneston-Skykomish-Birdsview-Winston.

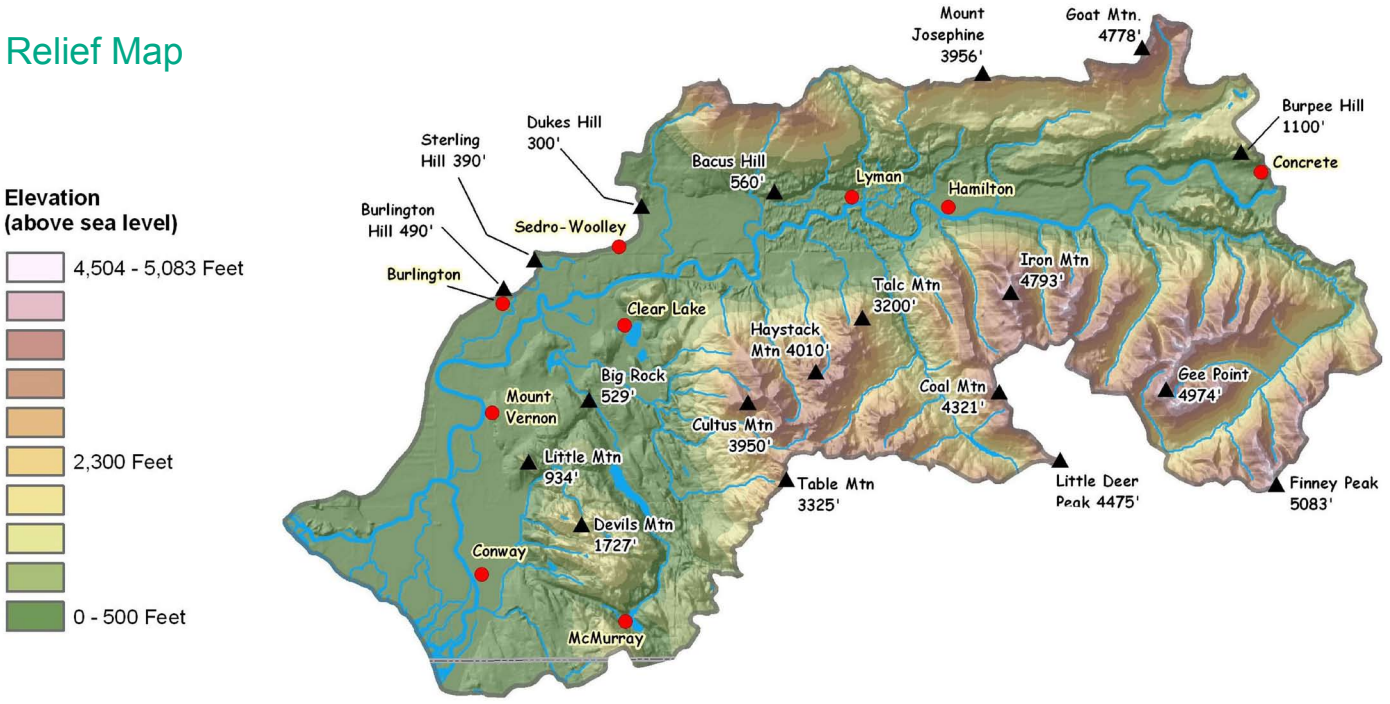
I8 - Soils on mountainsides and hills; some have soil properties typically associated with weathered volcanic ash although tephra may be absent. Xeric/Mesic to Frigid; No series mapped.

Mc - Medial-skeletal and medial soils, most have pumice or volcanic ash influence in the upper part and formed from glacial till or colluvium. Udic/Cryic; Playco-Kindy-Hatchet-Wollard-Getchell-Rock Outcrop.

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.

Rz - Wet, acid soils on deltas and tideflats that are less than 12 feet above sea level and are affected by tides and/or marine saltwater intrusion. Aquic/Mesic; Tacoma-Eliza-Ocosta.

Relief Map



Average Annual Precipitation Map

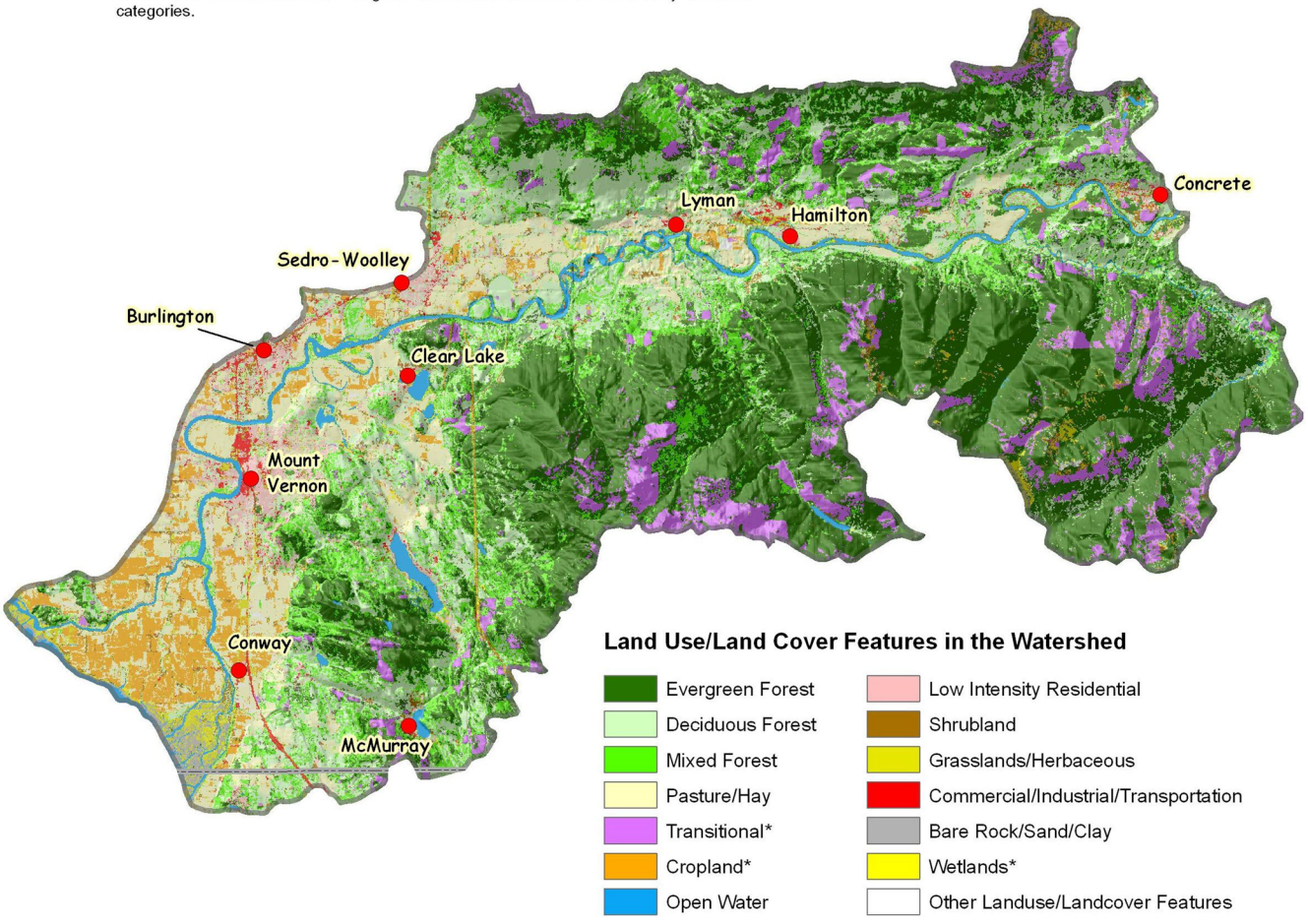
Landuse is a term used for a designation of a land area. NRCS uses official designations, based on use, such as cropland, forestland and pastureland. The Lower Skagit watershed map shows the primary landuse designations; Open Water, Emergent Herbaceous Wetland, Fallow, Quarries/Strip/Mines/Gravel Pits, and Urban/Recreational Grasses These 5 major landuses make up 86% of the watershed. Minor landuses are displayed in the table.

*NOTES:

Transitional - Areas of sparse vegetative cover (less than 25 percent) that are dynamically changing from one land cover to another, often because of land use activities. Examples include forest clearcuts, a transition phase between forest and agricultural land, the temporary clearing of vegetation, and changes due to natural causes (e.g. fire, flood, etc.)

Cropland is a combination of the Small Grains, Row Crops and Fallow categories.

Wetlands are combination the Emergent Herbaceous Wetlands and the Woody Wetlands categories.



Land Use/Land Cover features in the Watershed

Land Use/Land Cover	Acres	% Area
Evergreen Forest	107,288.32	37.74
Deciduous Forest	52,576.98	18.49
Mixed Forest	36,390.24	12.80
Pasture/Hay	24,658.69	8.67
Transitional*	22,720.10	7.99
Cropland*	10,028.35	3.53
Open Water	7,319.27	2.57
Low Intensity Residential	6,359.25	2.24
Shrubland	5,777.35	2.03

Land Use/Land Cover	Acres	% Area
Grasslands/Herbaceous	4,550.97	1.60
Commercial/Industrial/Transport	2,330.50	0.82
Bare Rock/Sand/Clay	2,011.64	0.71
Wetlands*	1,357.47	0.47
Orchards/Vinyards/Other	851.81	0.30
Urban/Recreational Grasses	47.46	0.02
Quarries/Strip Mines/Gravel Pits	15.56	0.01

Certain Land Use/Land Cover features cannot be seen on the map at this scale.

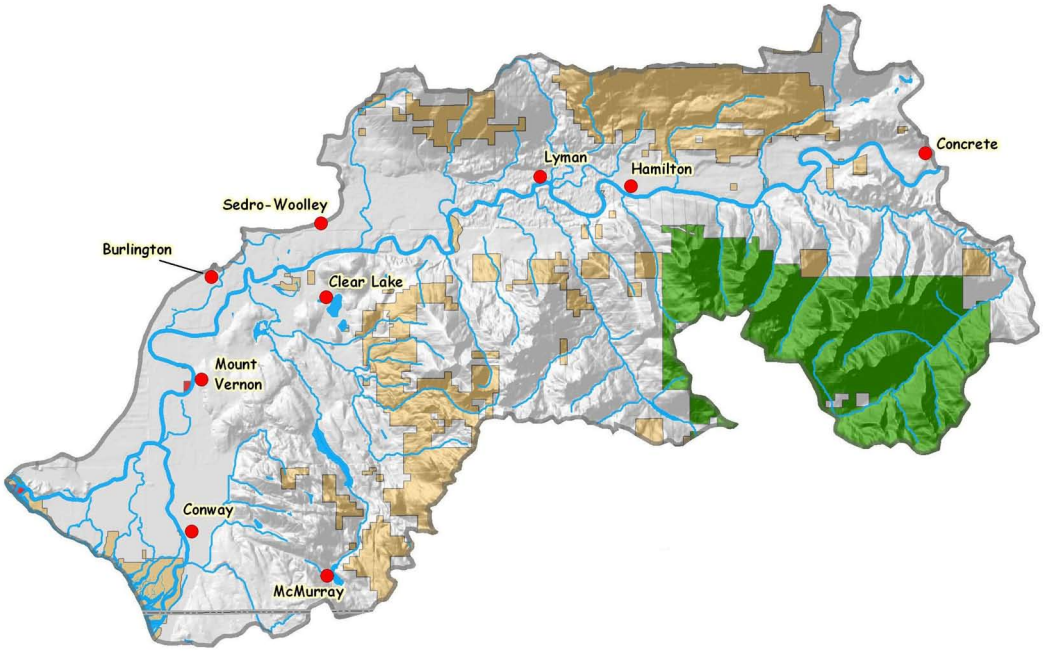
Ownership [10] and Farmland Classification [11]

Lower Skagit
284,302 Total Acres
HUC# 17110007

Ownership Map

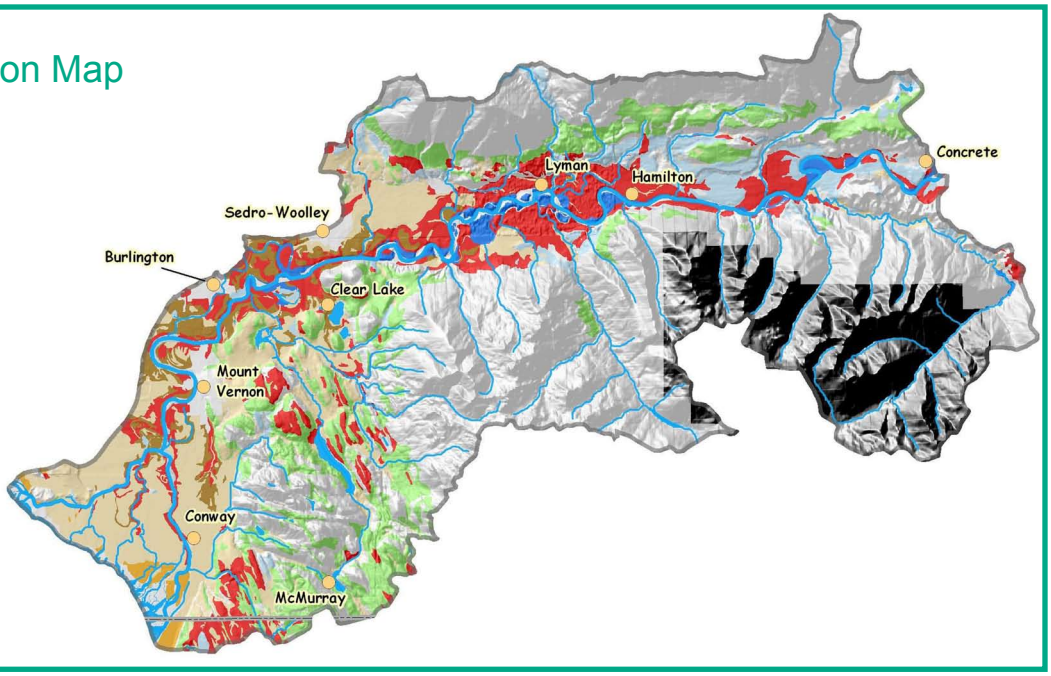
General Ownership

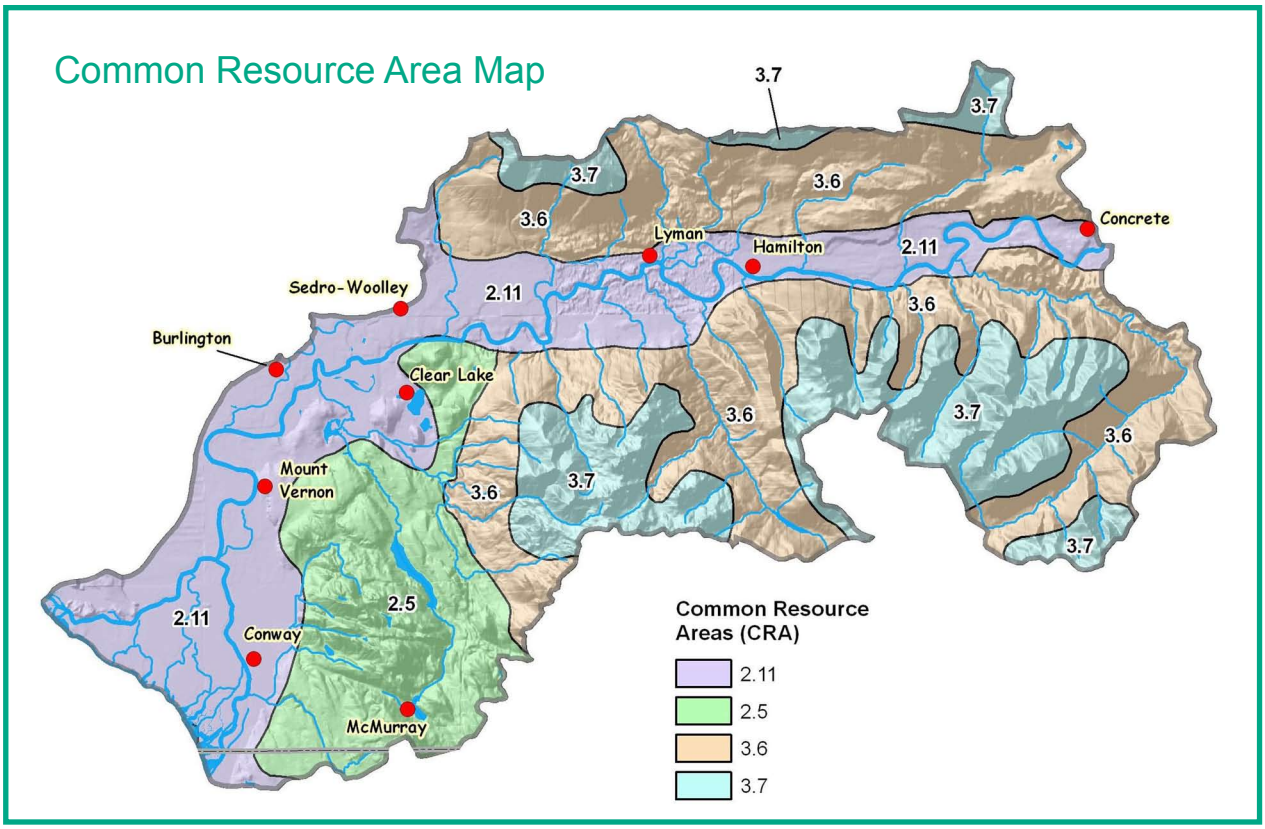
- PRIVATE 70.86%
- STATE GOVT. 16.20%
- FEDERAL GOVT. 12.89%
- COUNTY GOVT. 0.05%



Farmland Classification Map

% Area	Farmland Classification
10.86	All areas are prime farmland
12.44	Farmland of statewide importance
14.81	Prime farmland if drained
0.66	Prime farmland if drained and either protec from flooding or not frequently flooded durii growing season
4.74	Prime farmland if irrigated
1.51	Prime farmland if irrigated and either protec from flooding or not frequently flooded durii growing season
3.04	Prime farmland if protected from flooding o frequently flooded during the growing seas
51.94	Not prime farmland
N/A	No Data





2.11 - This unit is composed of floodplains and terraces. Western red cedar forest, western hemlock forest, and both riverine and wetland habitat were common before the 19th century. Subsequently, many of the wetlands were drained. Pastures, cropland, forests, and urban centers now dominate the landscape. Some riparian deciduous woodland, coniferous forests, wetlands.

2.5 - This unit consists of rolling moraines and foothills and is a zone of transition. Both MLRA 2 and MLRA 3 vegetation associations occur with the latter most common in areas of greatest elevation and precipitation. The relief and precipitation of this unit tend to be high for MLRA 2, but low compared to MLRA 3. Forestry, pastureland and cropland, rural residential/suburban/urban development.

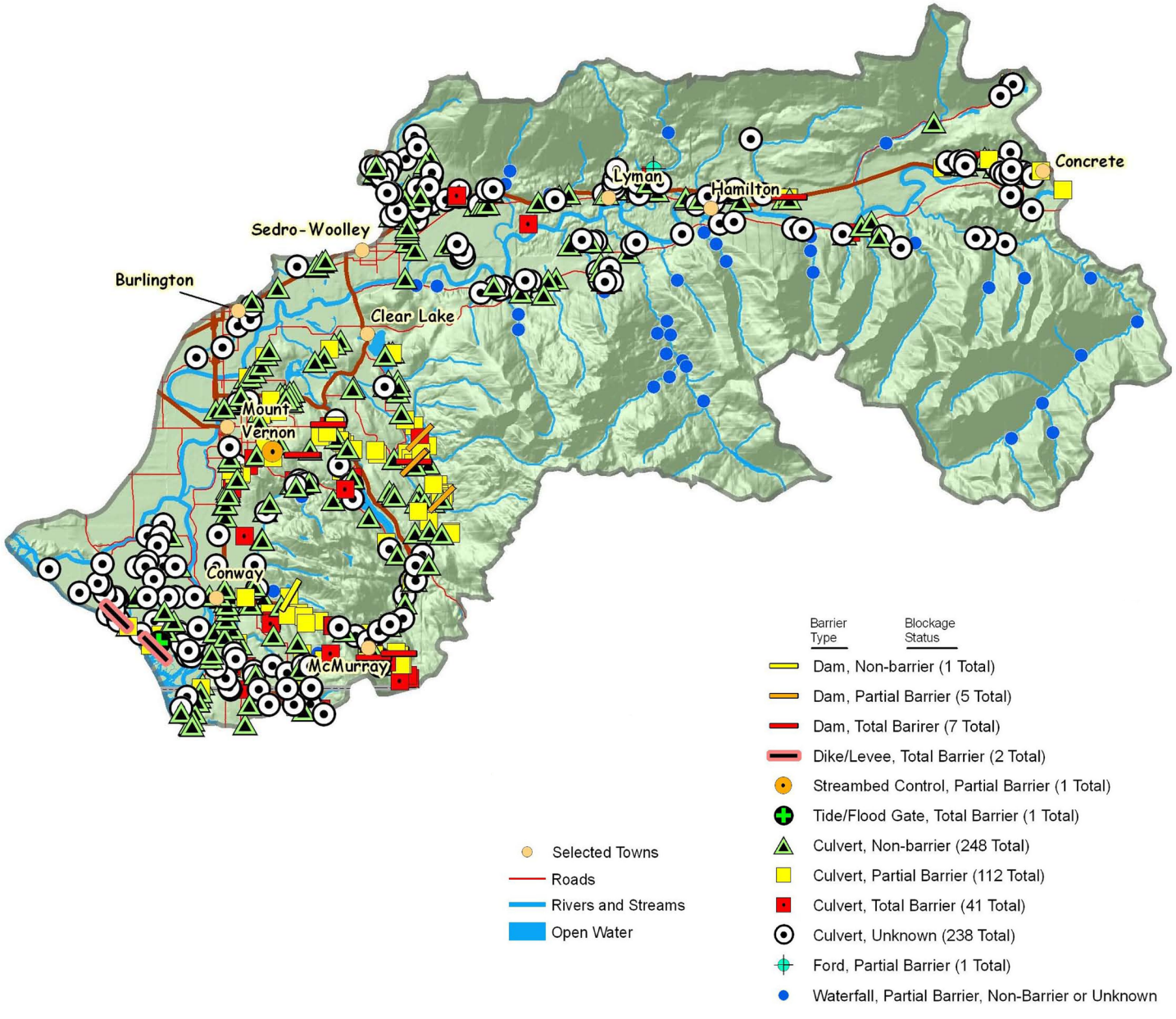
3.6 - This unit is composed of low mountains, broad glaciated valleys, and glacial-fed rivers that receive, on average, 60 to 90 inches of annual precipitation. Extensive, productive rainforests have developed under the mild maritime climate and are dominated by western hemlock, Douglas-fir, and western red cedar. Pastures occur in the valleys. Forestry is the dominant land use; rural residential development, recreation, and valley grazing also occurs. A mix of publicly and privately owned land.

3.7 - This unit consists of steep, glaciated ridges, high-gradient streams, and tarns. Colder climatic conditions, deeper snow pack, and Pacific silver fir/mountain hemlock forests distinguish it from the North Cascades Lowland Forests CRA. Common land uses include forestry and recreation. Most of the land is in public ownership.

Streams, Fish Species and Passage Barriers [7,8,9,18,19]

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

Upstream Fish Passage Barriers Map



(Streams, Fish Species and Passage Barriers continued on next page.)

Lower Skagit
284,302 Total Acres
HUC# 17110007

Fish Species Found in the Lower Skagit Watershed		
Fish Group	**Native**	**Exotic**
Catfish		1
Lamprey	3	
Minnow, carp	4	2
Perch, walleye		1
Pike, pickerel, muskellunge		
Salmonid (anadromous)	8	1
Salmonid (resident)	4	
Sculpin	4	
Shad		1
Shiner perch	1	
Smelt	2	
Starry flounder	1	
Stickleback	1	
Sturgeon	1	
Sucker	2	
Sunfish, bass, crappie		4
Watershed Total	**31**	**10**
Statewide Total	**53**	**41**

Stream Statistics for the Lower Skagit Watershed	
Total streams	174
Named streams	59
Total stream miles	503
Intermittent miles	48
Intermittent %	10%

Lower Skagit Watershed

Salmonid (resident)
Native: rainbow, bull trout; kokanee; mountain whitefish.

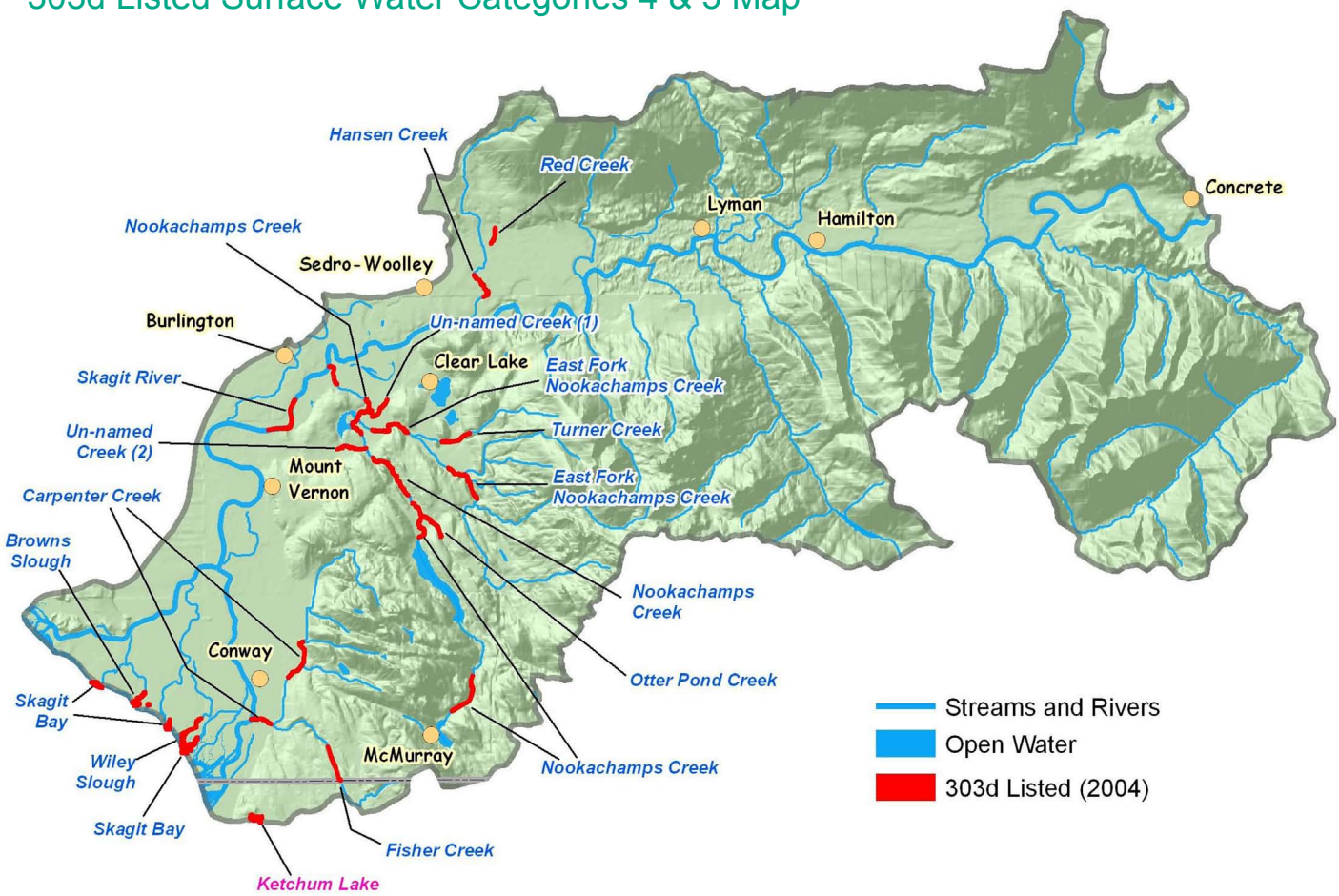
Salmonid (anadromous)
Native: Chinook, chum, coho, pink, sockeye salmon; steelhead, coastal cutthroat trout; Dolly Varden.

Exotic: Atlantic salmon.

Physical Descriptions
303d Listed Surface Water [12]

Section 303(d) of the federal Clean Water Act requires each 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.

303d Listed Surface Water Categories 4 & 5 Map



(303d Listed Surface Water continued on next page.)

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 that can be released into a waterbody without impairing the uses of the water. TDML's can be allocated amount among various pollution 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.

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.
>
> 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 Surface Water continued on next page.)

Physical Descriptions
303d Listed Streams [13]

Water Body	Fecal Coliform	Temperature	Dissolved Oxygen	pH	Total Phosphorus	Total PCBs	Ammonia-N	Chlordane	Mercury	Copper	Lead	Zinc	Nickel	Fluorene	Anthracene	Alpha-BHC	2,4,6-Trichlorophenol	Penta-chlorophenol	Nitro- benzene	4,4'- DDD	4,4'- DDE	4,4'- DDT
Browns Slough	x																					
Carpenter Creek	x	x		x																		
E.F. Nookachamps Creek	x	x	x																			
Fisher Creek		x																				
Hansen Creek		x																				
Nookachamps Creek	x	x	x																			
Otter Pond Creek	x	x	x																			
Red Creek		x																				
Skagit Bay	x																					
Skagit River	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Turner Creek		x																				
Un-named Creek (1) Creek		x																				
Un-named Creek (2) Creek	x	x	x																			
Wiley Slough	x		x	x																		
Ketchum Lake					x																	

(303d Listed Surface Water continued on next page.)

Physical Descriptions
303d Listed Streams

Lower Skagit
284,302 Total Acres
HUC# 17110007

Water Body	Bis (2-chloro-ethyl) ether	Bis (2-chloro-isopropyl) ether	Dimethyl-phthalate	hexachloro-ethane	N-ntirosodi-phenylamine	Hexachlorocyclo-pentadiene	Hexachloro-butadiene	1-2-Diphenyl-hydrazine	3,3-Dichloro-benzidine	2,4-Dinitro-toluene	1,4-Dichloro-benzene	2,4-Dinitro-phenol	1,3-Dichloro-benzene	1,2-Dichloro-benzene	2,4-Dichloro-phenol
Browns Slough															
Carpenter Creek															
E.F. Nookachamps															
Fisher Creek															
Hansen Creek															
Nookachamps															
Otter Pond Creek															
Red Creek															
Skagit Bay															
Skagit River	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Turner Creek															
Un-named Creek (1) Creek															
Un-named Creek (2) Creek															
Wiley Slough															
Ketchum Lake															

Riparian Land Use / Land Cover [5]

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.

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	365	2.4%
Commercial/Industrial/Transportation	114	0.7%
Deciduous Forest	2,656	17.3%
Emergent Herbaceous	24	0.2%
Evergreen Forest	3,924	25.5%
Fallow	3	0.0%
Grasslands/Herbaceous	559	3.6%
Low Intensity Residential	184	1.2%
Mixed Forest	2,180	14.2%
Open Water	2,206	14.4%
Orchards/Vineyards/Other	51	0.3%
Pasture/Hay	1,265	8.2%
Row Crops	316	2.1%
Shrubland	454	3.0%
Small Grains	411	2.7%
Transitional	449	2.9%
Woody Wetlands	206	1.3%
Grand Total	**15,369**	**100.0%**

Irrigated Cropland, Hayland and Pastureland [14]

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 Mt. Vernon office staffs.

Irrigated Lands
(1997 NRI [3] Estimates for Non-Federal Lands Only)

Type of Land	ACRES	Percent of Irrigated Lands	Percent of HUC
Cultivated Cropland	1,200	50%	<1%
Uncultivated Cropland	0	0%	0%
Pastureland	1,200	50%	<1%
Total Irrigated Lands	**2,400**	**100%**	**<1%**

Animal Feeding Operations

Animal Type	Dairy	Beef Feedlot	Heifer Feedlot	Poultry (Egg & Fryer)	Sheep Feedlot	Swine
No. of Farms	34	5	5	5	0	0

Cultural and Historic Sites [15]

Cultural resources are important to most residents in the watershed. 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 and used the resources in the Lower Skagit watershed for thousands of years. Native American tribes continue to hold treaty rights to harvest fish, wildlife and plants at usual and accustomed places.

An activity 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.

Air Quality, Ground Water and Wind Erosion

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

Resource Concerns

Lower Skagit
284,302 Total Acres
HUC# 17110007

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

Resource Concerns

Threatened and Endangered List [16,17]

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 Lower Skagit Watershed		
Common Name	**Scientific Name**	**Type**
Endangered Species		
None		
Threatened Species		
Bald Eagle	*Haliaeetus leucocephalus*	*Bird*
Marbled Murrelet	*Brachyramphus marmoratus*	*Bird*
Northern Spotted Owl	*Strix occidentalis caurina*	*Bird*
Chinook Salmon	*Oncorhynchus tsawytscha*	*Fish*

Farm Bill Programs
Performance Results [20]

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)	1,234	1,806	NA	198	128	3,366
Total Conservation Systems Applied (acres)	256	88	NA	714	412	1,470
Conservation Treatments						
Waste Management (no.)	0	0	0	0	1	1
Buffers (acres)	107	0	99	0	0	206
Erosion Control (tons/year)	0	0	NA	0	0	0
Erosion Control (acres)	0	0	NA	0	0	0
Irrigation Management (acres)	0	0	0	0	0	0
Nutrient Management (acres)	516	0	542	198	128	1,384
Pest Management (acres)	0	0	791	0	0	791
Prescribed Grazing (acres)	0	0	0	0	0	0
Trees/Shrubs (acres)	257	188	280	165	13	903
Wildlife Habitat (acres)	265	99	0	20	0	384
Wetlands (acres)	50	1	12	0	0	63

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)	248	66	0	0	0	314
Conservation Security Program (CSP)	NA	NA	NA	4,147	0	4,147
Environmental Quality Incentives Program - Ground and Surface Water (EQIP-GSWC)	-	0	0	0	0	0
Environmental Quality Incentives Program (EQIP)	0	469	0	28	28	525
Farmland Protection Program (FPP)	10	73	0	0	0	83
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	0	0	100	100
Wildlife Habitat Incentive Program (WHIP)	0	0	0	0	0	0

Census Data - Ethnicity and Economic Characteristics [22,23]

There are 872 farms in Skagit County, the core county comprising 98% of the agricultural operations in the watershed. An analysis of the 2002 Agricultural Census data by zip code suggests there are 377 agricultural operations in the watershed. The Skagit county average farm size in the 2002 Census of Agriculture was 131 acres. The 2002 average market value of agricultural products sold was $249,294 with a net cash farm income of $68,095. The Skagit county net cash farm income was 201% 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	Skagit	Washington
White persons, percent, 2004 (a)	93.8%	85.3%
Black persons, percent, 2004 (a)	0.6%	3.5%
American Indian and Alaska Native persons, percent, 2004 (a)	2.0%	1.6%
Asian persons, percent, 2004 (a)	1.8%	6.3%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.2%	0.5%
Persons reporting two or more races, percent, 2004	1.6%	2.9%
Persons of Hispanic or Latino origin, percent, 2004 (b)	12.7%	8.5%
White persons, not Hispanic, percent, 2004	81.6%	77.5%

	Skagit		Washington	
ECONOMIC CHARACTERISTICS by County	Number	%	Number	%
INCOME IN 1999				
Households	38,814	100	2,272,261	100
Less than $10,000	2,852	7	171,863	8
$10,000 to $14,999	2,349	6	124,848	6
$15,000 to $24,999	4,859	13	265,131	12
$25,000 to $34,999	5,388	14	284,630	13
$35,000 to $49,999	7,440	19	389,434	17
$50,000 to $74,999	8,148	21	486,392	21
$75,000 to $99,999	4,099	11	264,498	12
$100,000 to $149,999	2,372	6	188,513	8
$150,000 to $199,999	559	1	47,615	2
$200,000 or more	748	2	49,337	2
Median household income (dollars)	42,381	0	45,776	0

Lower Skagit
284,302 Total Acres
HUC# 17110007

	Skagit		Washington	
ECONOMIC CHARACTERISTICS by County	**Number**	**%**	**Number**	**%**
Employed civilian population 16 years and over	45,729		2,793,722	
OCCUPATION				
Management, professional, and related occupations	13,028	29	993,198	36
Service occupations	7,172	16	416,056	15
Sales and office occupations	11,348	25	723,256	26
Farming, fishing, and forestry occupations	1,808	4	43,495	2
Construction, extraction, and maintenance occupations	5,270	12	263,767	9
Production, transportation, and material moving occupations	7,103	16	353,950	13
INDUSTRY				
Agriculture, forestry, fishing and hunting, and mining	2,685	6	68,976	3
Construction	4,108	9	194,871	7
Manufacturing	6,170	14	348,646	13
Wholesale trade	1,876	4	113,526	4
Retail trade	5,925	13	338,772	12
Transportation and warehousing, and utilities	2,083	5	150,985	5
Information	921	2	95,669	3
Finance, insurance, real estate, and rental and leasing	2,047	5	170,622	6
Professional, scientific, management, administrative, and waste management services	2,823	6	272,466	10
Educational, health and social services	8,488	19	541,214	19
Arts, entertainment, recreation, accommodation and food services	4,598	10	221,656	8
Other services (except public administration)	2,027	4	135,379	5
Public administration	1,978	4	140,940	5
CLASS OF WORKER				
Private wage and salary workers	34,184	75	2,125,029	76
Government workers	7,208	16	459,722	17
Self-employed workers in own not incorporated business	4,121	9	199,827	7
Unpaid family workers	216	1	9,144	0

2002 AG CENSUS DATA	Skagit
Farms (number)	872
Land in farms (acres)	113,821
Total cropland (acres)	76,178
Irrigated land (acres)	17,658
Principal operator by primary occupation - Farming (number)	531
Principal operator by place of residence - On farm operated (number)	737
Farms by Size	
Average size of farm (acres)	131
1 to 9 acres	164
10 to 49 acres	357
50 to 69 acres	68
70 to 99 acres	63
100 to 139 acres	56
140 to 179 acres	35
180 to 219 acres	31
220 to 259 acres	13
260 to 499 acres	42
500 to 999 acres	21
1,000 to 1,999 acres	12
2,000 acres or more	10
Livestock and Poultry	
Inventory - Cattle and calves (farms)	402
Inventory - Cattle and calves - Beef cows (farms)	267
Inventory - Cattle and calves - Milk cows (farms)	74
Inventory - Hogs and pigs (farms)	20
Inventory - Sheep and lambs (farms)	32
Inventory - Layers 20 weeks old and older (farms)	80
Inventory - Broilers and other meat-type chickens (farms)	8

(Ag census data continued on next page.)

Lower Skagit
284,302 Total Acres
HUC# 17110007

2002 AG CENSUS DATA	Skagit
Selected Crops Harvested (acres)	
Harvested cropland (acres)	62,074
Harvested cropland - Irrigated (acres)	17,234
Corn for grain (acres)	0
Corn for grain - Irrigated (acres)	0
Corn for silage or greenchop (acres)	5,871
Corn for silage or greenchop - Irrigated (acres)	550
Wheat for grain, all (acres)	5,886
Wheat for grain, all - Irrigated (acres)	190
Wheat for grain, all - Winter wheat for grain (acres)	0
Wheat for grain, all - Spring wheat for grain (acres)	0
Barley for grain (acres)	456
Barley for grain - Irrigated (acres)	0
Oats for grain (acres)	38
Oats for grain - Irrigated (acres)	0
Potatoes (acres)	11,205
Sugarbeets for sugar (acres)	0
Forage - land used for all hay, haylage, grass silage, and greenchop (acres)	16,968
Forage - land used for all hay, haylage, grass silage, and greenchop - Irrigated (acres)	1,174
Vegetables harvested for sale (acres)	12,046
Land in orchards (acres)	438
Land in orchards - Irrigated (acres)	289

Many natural resource and socio-economic studies have been conducted in the Lower Skagit 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, Mt. Baker-Snoqualimie National Forest address resource needs on National Forest lands within the Lower Skagit Watershed as part of their Forest planning process.

The North Cascade 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 03, Lower Skagit-Samish

Title	Number	
Focus on Samish Watershed	06-10-030	June 2006
Rule Adoption Notice: Amendments to Instream Resources Protection Program--Lower and Upper Skagit Water Resources Inventory Areas (WRIAs 3 and 4)	06-11-008	May 2006
Chapter 173-503 WAC Implementation Plan for the Adoption of Amendments to Instream Resources Protection Program--Lower and Upper Skagit Water Resources Inventory Area (WRIA 3 and 4)	06-11-009	May 2006
Chapter 173-503 WAC Cost Benefit Analysis, Maximum Net Benefit Analysis & Least Burdensome Analysis for Instream Resources Protection Program--Lower and Upper Skagit Water Resources Inventory Areas 3 and 4	06-11-010	May 2006
Responsiveness Summary and Concise Explanatory Statement for the adoption of: Chapter 173-503 WAC Water Resources Management & Instream Flow Program Skagit River Basin Water Resource Inventory Areas 3 and 4	06-11-011	May 2006
Revised Small Business Economic Impact Statement for Amendment to Chapter 173-503 WAC Instream Resources Protection Program - Lower and Upper Skagit Water Resources Inventory Area 3 and 4	06-11-012	May 2006
Quality Assurance Project Plan: Samish Bay Fecal Coliform Bacteria Total Maximum Daily Load Study	06-03-102	March 2006
Addendum to the Quality Assurance Project Plan for Surface Water Monitoring Program for Pesticides in Salmonid-Bearing Streams: Addition of Skagit-Samish Watersheds, and Extension of Program through June 2009.	03-03-104ADD	March 2006

Title	Number	
Progress on Watershed Planning and Setting Instream Flows	05-11-038	December 2005
Chapter 173-503 WAC: Small Business Economic Impact Statement for the Proposed Amendments to Instream Resources Protection Program--Lower and Upper Skagit Water Resources Inventory Area (WRIA 3 and 4)	05-11-036	October 2005
Chapter 173-503 WAC Preliminary Cost Benefit Analysis Preliminary Maximum Net Benefit Analysis & Preliminary Least Burdensome Analysis Instream Resources Protection Program: Lower and Upper Skagit Water Resources Inventory Area (WRIA 3 and 4)	05-11-037	October 2005
Verification of 303(d) Listings for Fish Tissue in the Skagit and Pend Oreille Rivers	05-03-017	June 2005
Small Business Economic Impact Statement For Amendment to Chapter 173-503 WAC, Instream Resources Protection Program-Lower And Upper Skagit Water Resources Inventory Area (WRIA 3 And 4)	05-11-004	February 2005
Preliminary Benefit-Cost & Least Burdensome Analysis For Amendment To Chapter 173-503 WAC, Instream Resources Protection Program-Lower And Upper Skagit Water Resources Inventory Area (WRIA 3 and 4)	05-11-005	February 2005
Quality Assurance Project Plan: Verification of 303(d) Listings for Fish Tissue in the Skagit and Pend Oreille Rivers	04-03-115	November 2004
Quality Assurance Project Plan: Total Maximum Daily Load Effectiveness Monitoring Study: Lakes Erie and Campbell	04-03-206	September 2004
Quality Assurance Project Plan: Lake Bacteria Sampling Project	04-03-202	July 2004
Responsiveness Summary: Chapter 173-503 WAC, Instream Resources Protection Program for Upper and Lower Skagit Water Resources Inventory Areas	01-11-004	March 2004
Lower Skagit River Tributaries Temperature Total Maximum Daily Load Study	04-03-001	January 2004
Chemical Contamination, Acute Toxicity in Laboratory Tests, and Benthic Impacts in Sediments of Puget Sound: A summary of results of the joint 1997-1999 Ecology/NOAA survey	03-03-049	November 2003
Mercury in Edible Fish Tissue and Sediments from Selected Lakes and Rivers of Washington State	03-03-026	June 2003
Focus on Water Temperatures in the Lower Skagit River Tributaries	03-10-039	June 2003

Title	Number	
Washington State Toxics Monitoring Program: Toxic Contaminants in Fish Tissue and Surface Water in Freshwater Environments, 2001	03-03-012	March 2003
Quality Assurance Project Plan: Screening Survey of Mercury Levels in Edible Fish Tissue from Selected Lakes and Rivers of Washington State	02-03-080	October 2002
Salmon Recovery Index Watershed Monitoring Program: Water Quality Index Report, October 2000 - September 2001	01-03-046	December 2001
Quality Assurance Project Plan: Stillaguamish River Temperature Total Maximum Daily Load	01-03-066	December 2001
River and Stream Ambient Monitoring Report for Water Year 2000	01-03-042	December 2001
Water Cleanup Plans: Skagit River Watershed	01-10-035	June 2001
Quality Assurance Project Plan: Program for Monitoring Salmon Recovery in Index Watersheds: Water Quality and Quantity	00-03-098	December 2000
Summary of Streamflow Conditions, September 2000: Fisher Creek and Carpenter Creek Basin	00-03-049	December 2000
Lower Skagit River Fecal Coliform Total Maximum Daily Load Submittal Report -- Water Cleanup Plan	00-10-010	June 2000
Results of a Screening Analysis for Metals and Organic Compounds in Shellfish from Padilla Bay and Vicinity	00-03-008	May 2000
Water Quality Assessments of Selected Lakes within Washington State: 1997	00-03-009	March 2000
Sediment Quality on the West Side of Inner Fidalgo Bay	00-03-007	January 2000
Sediment Quality in Puget Sound: Year 1, Northern Puget Sound	99-347	December 1999
River and Stream Ambient Monitoring Report for Water Year 1997	99-332	August 1999
Aquatic Plants Technical Assistance Program 1998 Activity Report	99-328	June 1999
Investigation of Chemical Contamination at Whitmarsh Landfill & Padilla Bay Lagoon	99-306	1999
Data Appendix (Appendix G) for Investigation of Chemical Contamination at Whitmarsh Landfill & Padilla Bay Lagoon	99-307	1999
Aquatic Plants Technical Assistance Program 1997 Activity Report	98-311	1998
River and Stream Ambient Monitoring Report for Wateryear 1996	98-317	1998

Title	Number	
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
Water Quality Assessments of Selected Lakes within Washington State - 1994	97-307	1997
Lower Skagit River Total Maximum Daily Load Water Quality Study	97-326a	1997
Survey for Petroleum and Other Chemical Contaminants in the Sediments of Fidalgo Bay	97-338	1997

Footnotes and Bibliography

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/natllandcover.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 and Bibliography

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 SalmonScape 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 and 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 interpretation databases. The following surveys were used:

    Skagit County Area., WA (WA657) Published 2004 10 12
    Snohomish County, WA (WA661) Published 2005 11 03

    These 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://web soilsurvey.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/WATSQBEHome.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 included. These locations are instead represented by 'areas-of-concern'. Occurrences of species considered

Footnotes and Bibliography

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_Icc. 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 specifica 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 Skagit County and Washington State. For more information on census data and definitions visit http://www.census.gov/Press-Re lease/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/wria03.html
Publications listed by a Watershed Resource Inventory Area, WRIA 03, Lower Skagit-Samish.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).
To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410, or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.