



Introduction

The Lower Willamette 8-Digit Hydrologic Unit Code (HUC) subbasin is 260,900 acres in Northwest Oregon. It includes the Portland metropolitan area. Eighty-five percent of the subbasin is in two counties: Multnomah and Columbia. Eighty percent of the 1,126 farms in the subbasin are less than 50 acres in size.

The subbasin is over 90 percent privately owned, and approximately one third of that is developed. Over half of the private land is forestland. The remainder of the private land (52,500 ac.) includes a mix of pasture and hay, row crops, shrub, nurseries, Christmas trees, and grain crops.

Conservation assistance is provided by three NRCS service centers, one Resource Conservation and Development (RC&D) office, and four Soil and Water Conservation Districts.

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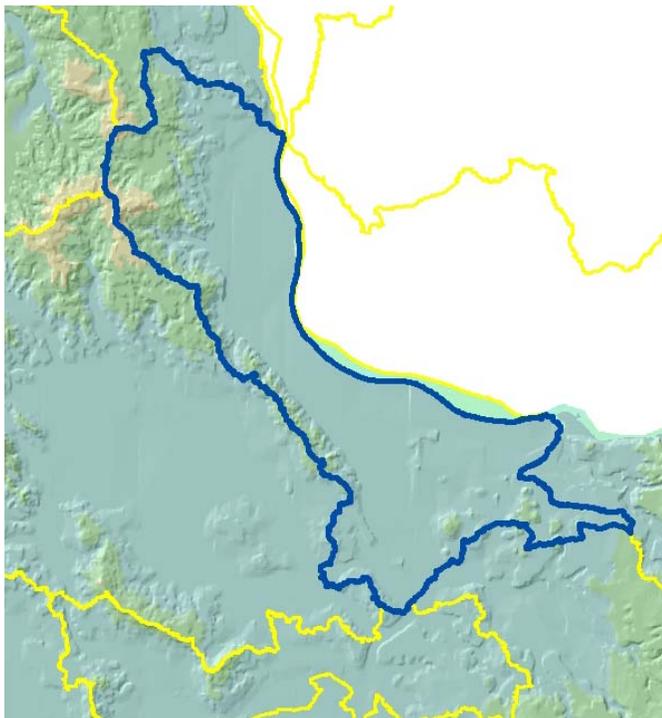
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Relief Map



Physical Description

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Land Cover/Land Use (NLCD ²)	Ownership - (2003 Draft BLM Surface Map Set ¹)							Totals ^b	%
	Public		Private		Tribal				
	Acres	%	Acres	%	Acres	%			
Forest	12,400	5%	93,300	38%	0	0%	111,000	43%	
Grain Crops	*	--	*	--	0	0%	*	--	
Conservation Reserve Program Land ^a	0	0%	*	--	0	0%	*	--	
Grass/Pasture/Hay Lands	*	--	21,600	8%	0	0%	24,900	10%	
Orchards/Vineyards/Nurseries	*	--	3,100	1%	0	0%	3,100	1%	
Row Crops	*	--	13,200	5%	0	0%	14,300	5%	
Shrub/Rangelands	*	--	6,000	2%	0	0%	9,300	4%	
Water/Wetlands/Developed/Barren	5,500	2%	56,400	21%	0	0%	97,200	37%	
Oregon HUC Totals ^b	20,400	8%	194,600	74%	0	0%	260,900	100%	

*: Less than one percent of total acres. See below for special considerations.

a: Estimate from Farm Service Agency records and include CRP/CREP.

b: Totals may not add due to rounding and small unknown acreages.

Special Considerations for this 8 Digit HUC:

- Thirty-six percent of private forest is in industrial forest ownership (OSU, Forestry Sciences Laboratory).
- Much of the non-industrial private forest land in the watershed is on farms less than 50 acres in size.
- As of December 2004, 58 acres of CREP have been applied (FSA).
- Orchards/Vineyards/Nurseries include other perennial crops such as nursery stock, hybrid poplars and Christmas trees.
- Grass/Pasture/Hay includes approximately:
 - 2,700 acres of grass seed (Pacific Northwest Ecosystem Research Consortium)
 - 8,900 acres of pasture (Pacific Northwest Ecosystem Research Consortium)
 - 5,300 acres of hay (Pacific Northwest Ecosystem Research Consortium)
 - Leaving 4,700 acres of miscellaneous grasslands (open space/vacant parcels) within the metropolitan area of Multnomah, Washington and Columbia Counties
- Row crops include a variety of field and vegetable crops grown for the cannery processing and fresh market.
- There are approximately 2,900 acres of grain (Pacific Northwest Ecosystem Research Consortium)
- Shrub/rangelands consist of oak savannahs and other open areas.
- Thirty-seven percent of the watershed consists of urban land uses within metropolitan areas.

Irrigated Lands (1997 NRI ³ Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	6,000	77%	2%
	Non-Cultivated Cropland	400	5%	0%
	Pastureland	1,400	18%	<1%
	Total Irrigated Lands	7,800	100%	3%

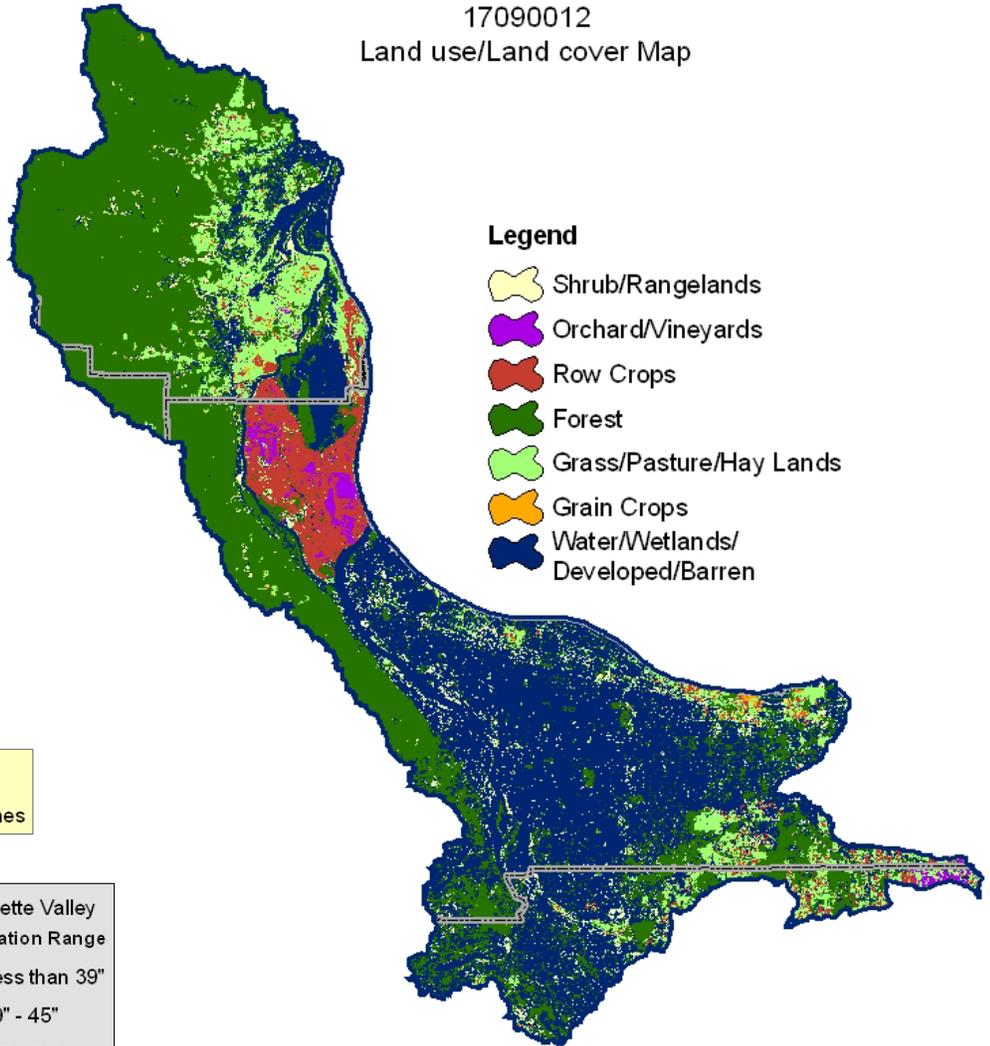
(Continued on following pages)

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17090012
Land use/Land cover Map

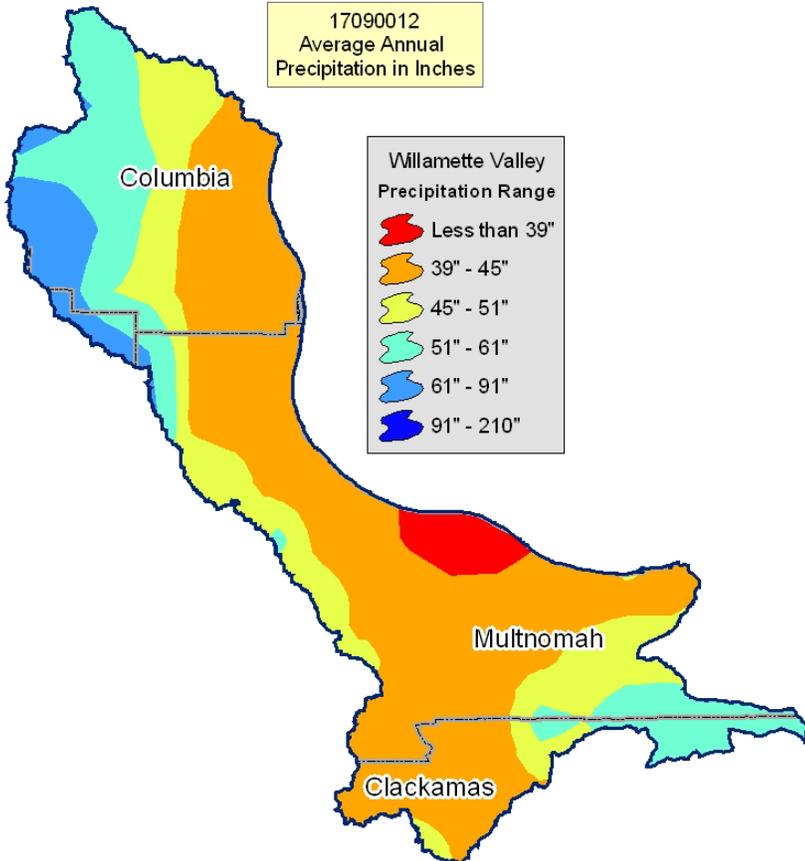
Legend

-  Shrub/Rangelands
-  Orchard/Vineyards
-  Row Crops
-  Forest
-  Grass/Pasture/Hay Lands
-  Grain Crops
-  Water/Wetlands/
Developed/Barren



17090012
Average Annual
Precipitation in Inches

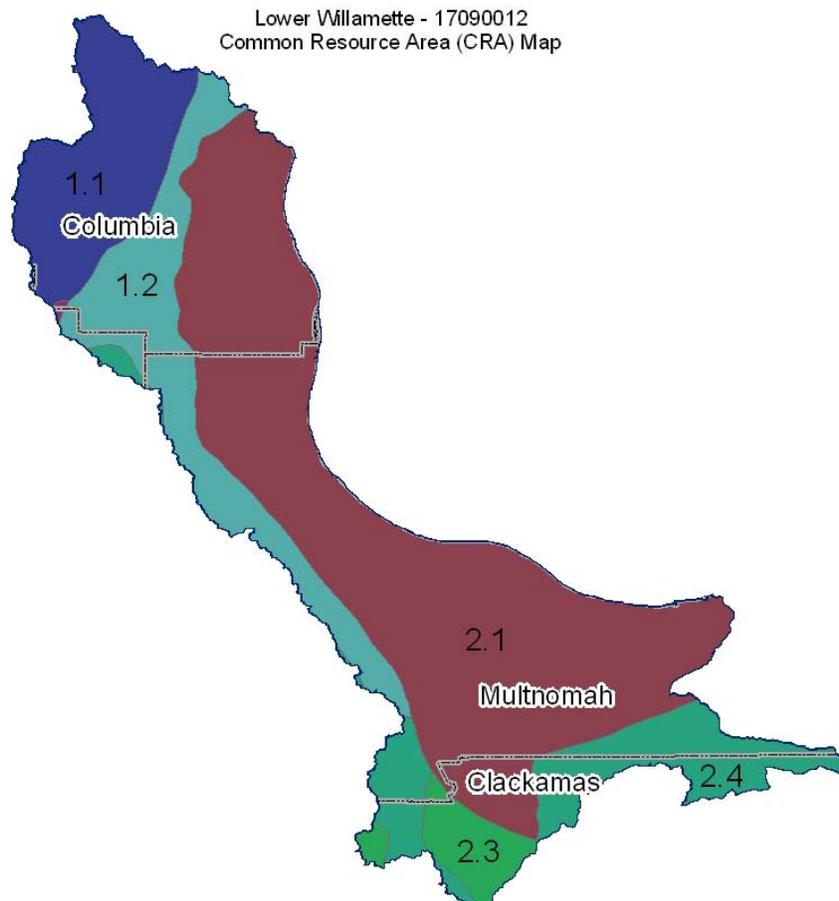
- Willamette Valley
Precipitation Range
-  Less than 39"
 -  39" - 45"
 -  45" - 51"
 -  51" - 61"
 -  61" - 91"
 -  91" - 210"



Common Resource Area Map

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CRA Map - areas with a majority are listed below - for descriptions of every class within the HUC, go to: <http://ice.or.nrcs.usda.gov/website/cra/viewer.htm>



1.1 - Northern Pacific Coast Range, Foothills, and Valleys - Volcanics: This unit is comprised of mountains having basalt bedrock outside of the "fog belt". Temperature regime is mesic, frigid and small area of cryic; moisture regime is udic. Vegetation is Douglas-fir and western hemlock.

1.2 - Northern Pacific Coast Range, Foothills, and Valleys - Willapa Hills: This unit is comprised of lower elevation mountains and foothills in the Coast Range. The soils are underlain by sedimentary bedrock but have a more silty and clayey texture throughout the profiles. The soils in unit 1.6 are more loamy in texture. Fragipans are present in some of these soils. Temperature regime is mesic; moisture regime is udic. Vegetation is Douglas-fir and western hemlock.

2.1 - Willamette and Puget Valleys - Portland/Vancouver Basin: This unit is comprised of the terraces and floodplains of the Willamette and Columbia Rivers in the Portland/Vancouver Metro Area. Landforms, soils and vegetation have similarities to the remainder of the Willamette Valley but since H (humans) are a component within SWAPA +H, this area of the state will have different management concerns that will need to be addressed (urban, nurseries, etc.). Temperature regime is mesic; moisture regime is xeric.

2.3 - Willamette and Puget Valleys - Prairie Terraces: This unit is comprised of the terraces in the Willamette Valley. The soils range from well drained to poorly drained. Land use is variable. Temperature regime is mesic; moisture regime is xeric. Numerous ponded seasonal wetlands.

2.4 - Willamette and Puget Valleys - Valley Foothills: This unit is comprised of the foothills of the Willamette Valley. The soils are over basalt and sedimentary bedrock and are typically red and clayey. Vegetation is Douglas-fir and Oregon white oak. Temperature regime is mesic; moisture regime is xeric. The unit lacks western hemlock which is characteristic of the adjacent units in the Coast and Cascade MLRA's.

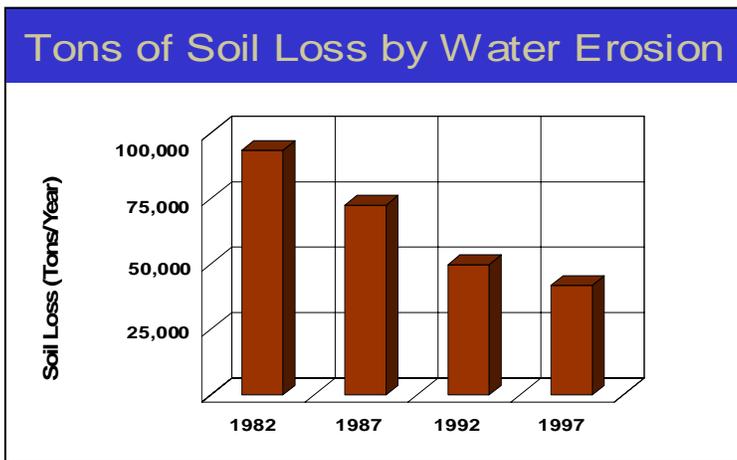
Physical Description – Continued

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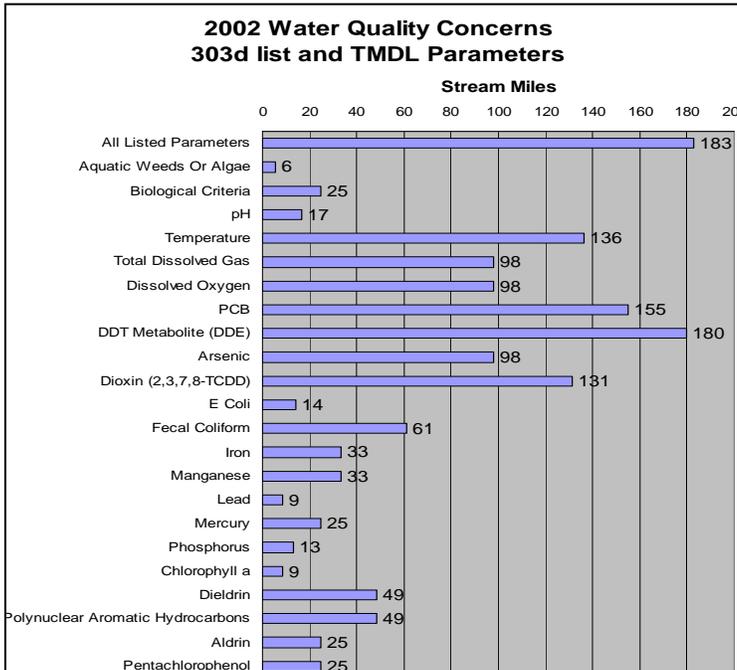
		ACRES	ACRE-FEET			
Irrigated Adjudicated Water Rights <i>(OWRD⁴)</i>	Surface	13,624	34,099			
	Well	5,699	14,263			
	Total Irrigated Adjudicated Water Rights	19,323	48,362			
Stream Flow Data	USGS 14211720 WILLAMETTE RIVER AT PORTLAND, OR	Total Avg. Yield	24,005,671			
		May - Sept Yield	4,486,784			
		MILES	PERCENT			
Stream Data ⁵ <i>*Percent of Total Miles of streams in HUC</i>	Total Miles – Major (100K Hydro GIS Layer)	372	--			
	303d (DEQ Water Quality Limited Streams)	183	49%			
	Anadromous Fish Presence (Streamnet)	54	15%			
	Bull Trout Presence (Streamnet)	0	0%			
		ACRES	PERCENT			
Land Cover/Use ² based on a 100 ft. stretch on both sides of all streams in the 100K Hydro Layer	Forest	4,151	46%			
	Grain Crops	38	0%			
	Grass/Pasture/Hay Lands	651	7%			
	Orchards/Vineyards	107	1%			
	Row Crops	508	6%			
	Shrub/Rangelands – Includes CRP Lands	280	3%			
	Water/Wetlands/Developed/Barren	3,267	36%			
	Total Acres of 100 ft stream buffers	9,002	--			
Land Capability Class <i>(Croplands & Pasturelands Only)</i> <i>(1997 NRI³ Estimates for Non-Federal Lands Only)</i>	I – slight limitations	0	0%			
	II – moderate limitations	16,700	37%			
	III – severe limitations	13,400	30%			
	IV – very severe limitations	2,100	5%			
	V – no erosion hazard, but other limitations	0	0%			
	VI – severe limitations, unsuited for cultivation, limited to pasture, range, forest	12,400	28%			
	VII – very severe limitations, unsuited for cultivation, limited to grazing, forest, wildlife	0	0%			
	VIII – misc areas have limitations, limited to recreation, wildlife, and water supply	0	0%			
	Total Crop & Pasture Lands	44,600	--			
Confined Animal Feeding Operations – Oregon CAFO Permit – 12/2004						
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Swine	Mink	Other
No. of Permitted Farms	2	1			1	1
No. of Permitted Animals	1,050	850			3,700	150

Resource Concerns

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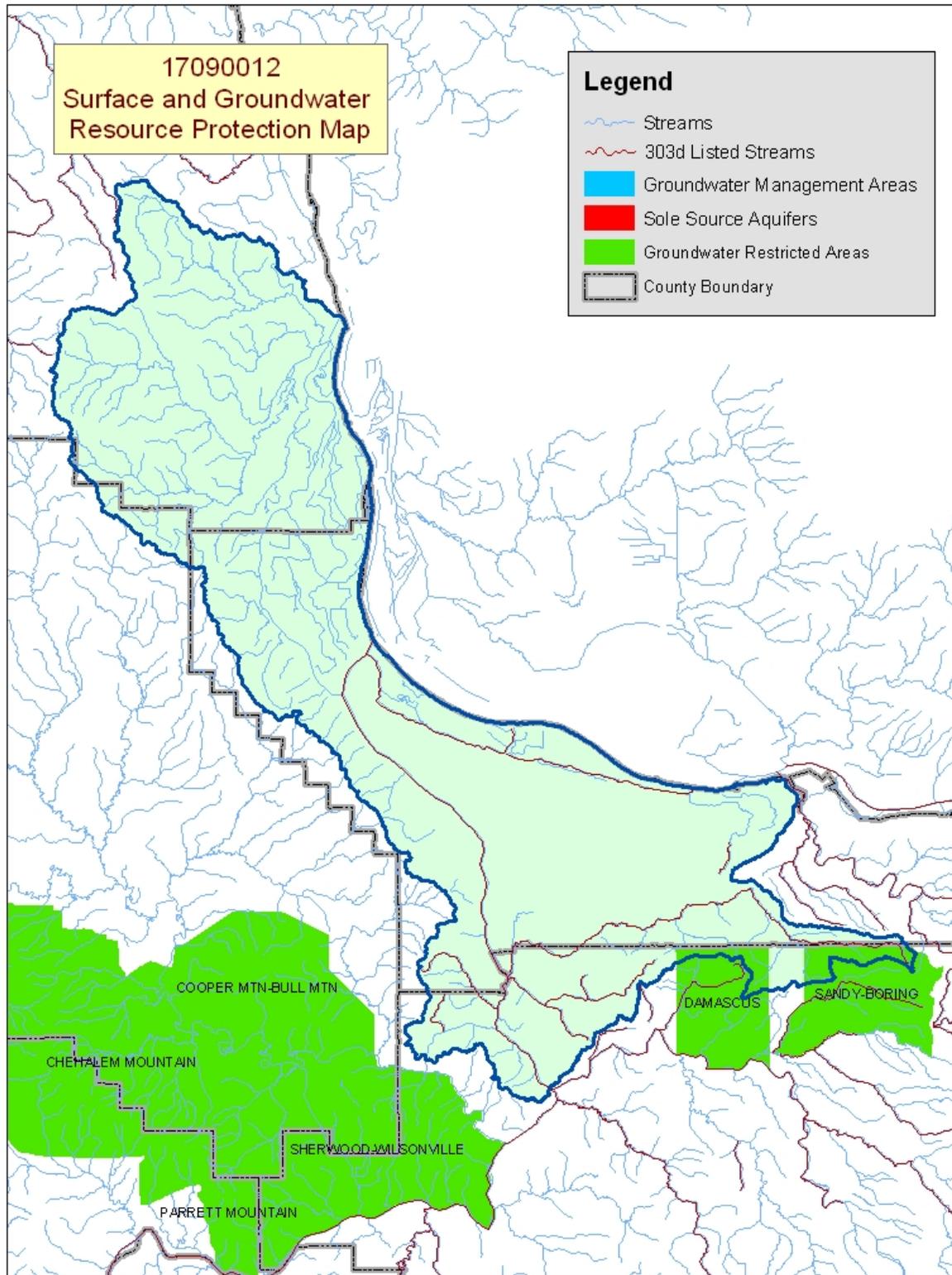


- ❖ Sheet and rill erosion by water on the subbasin croplands and pasturelands have been reduced by more than 50 thousand tons of soil per year from 1982 to 1997.
- ❖ NRI estimates indicate 1,400 acres of the subbasin agricultural lands still had water erosion rates above a sustainable level in 1997.
- ❖ Controlling erosion not only sustains the long-term productivity of the land, but also affects the amount of soil, pesticides, fertilizer, and other substances that move into the nation's waters.
- ❖ Through NRCS programs many farmers and ranchers have applied conservation practices to reduce the effects of erosion by water. As a result, erosion rates on croplands and pasturelands fell 40 percent from 1.6 to 0.9 tons/acre/year from 1982 to 1997.



- ❖ The wide arrays of listed water quality parameters are indicative of more intense agriculture as well as suburban, urban and commercial/industrial land uses.
- ❖ Conservation practices that can be used to address these water quality issues on agricultural lands include erosion control, irrigation water management, nutrient and pest management, livestock waste management, grazing management and riparian buffers.

Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects ⁶		NRCS Watershed Plans, Studies & Assessments ⁷	
Name	Status	Name	Status
None		None	
ODEQ TMDL's ⁸		ODA Agricultural Water Quality Management Plans ⁹	
Name	Status	Name	Status
Columbia & Willamette Rivers Columbia Slough Willamette Basin	EPA Approved – 1991 EPA Approved – 1998 Draft for Review	Lower Willamette North Coast	Completed Completed
OWEB Watershed Council ¹⁰		NWPC Subbasin Plans & Assessments ¹⁸	
Columbia Slough, Fairview Creek, Johnson Creek, Scappose Bay, and Tryon Creek Watershed Councils	To Be Completed Later	Willamette	



Map Footnote [417](#)

Resource Concerns - Continued

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Resource Concerns/Issues by Land Use		Pasture \ Hay	Grain Crops	Row Crops	Orchard/Vine	Shrub/Range	Forest
SWAPA +H Concerns	Specific Resource Concern/Issue						
Soil Erosion	Sheet & Rill		X	X	X		
	Concentrated Flow or Gully			X	X		X
	Classic Gully						X
	Streambank	X					X
	Irrigation Induced			X	X		
Soil Condition	Tilth, Crusting, Infiltration, Organic Matter		X	X	X		
	Soil Compaction	X	X				X
Water Quantity	Ponding & Flooding		X				
	Water Mgt. For Irrigated Land			X	X		
Water Quality, Groundwater	Pesticides				X		X
	Nutrients & Organics	X			X		X
	Pathogens	X					
Water Quality, Surface	Pesticides	X	X				X
	Nutrients & Organics	X	X		X		X
	Suspended Sediments & Turbidity						X
	Pathogens	X					
Plant Suitability	Aquatic Habitat Suitability						X
	To Site & Intended Use	X					X
Plant Condition	Productivity, Health & Vigor						
	Noxious and Invasive Plants			X	X	X	X
Plant Management	Establishment, Growth, & Harvest		X	X	X		X
Animal Habitat, Domestic	Management	X					
Animal Habitat, Wildlife	Management						X
Human Economics	Land Use Constraints/Restrictions				X		X
	High Capital/Financial Costs	X					
	High Labor Costs or Availability						X
	High Management Level Required	X	X	X			
	Low or Unreliable Profitability	X	X	X	X		
Human, Political	Inadequate availability of Cost Share Programs						X

Grass/Pasture/Hay Lands

- Complications related to overgrazing include poor pasture condition, soil compaction and water quality issues.
- Control of noxious and invasive plants is an ever increasing problem.
- The small, part-time farms are less likely to adopt conservation due to cost and low farm income.

Row & Perennial (orchards/vineyards/nurseries) Crops

- Residue, nutrient and pest management are needed to control erosion and to protect water quality.
- The small, part-time farms are less likely to adopt conservation due to cost and low farm income.

Forest

- On private, non-industrial forest there are issues with erosion, water quality and forest productivity.
- On non-industrial forest land, landowner objectives often are not on actively managing the land for timber production. Land use constraints and the lack of economic incentives further discourage conservation.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES¹²

Threatened Species	Candidate Species
Mammals – Columbian white-tailed deer, Canada lynx Birds - Bald eagle, Northern spotted owl Fish - Chum salmon, Steelhead, Chinook salmon, Bull trout Plants – Golden Indian paintbrush, Willamette daisy, Howellia, Bradshaw's lomatium, Kincaid's lupine, Nelson's checker-mallow	Fish - Steelhead (Oregon Coast), Coho salmon (Lower Columbia River) Birds – Yellow-billed cuckoo, Streaked horned lark Amphibians and Reptiles – Oregon spotted frog
	Proposed Species None
ESSENTIAL FISH HABITAT ¹³ – Coho, Chinook	

Census and Social Data^{/14}

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Number of Farms: 1,126

Number of Operators: 1,860

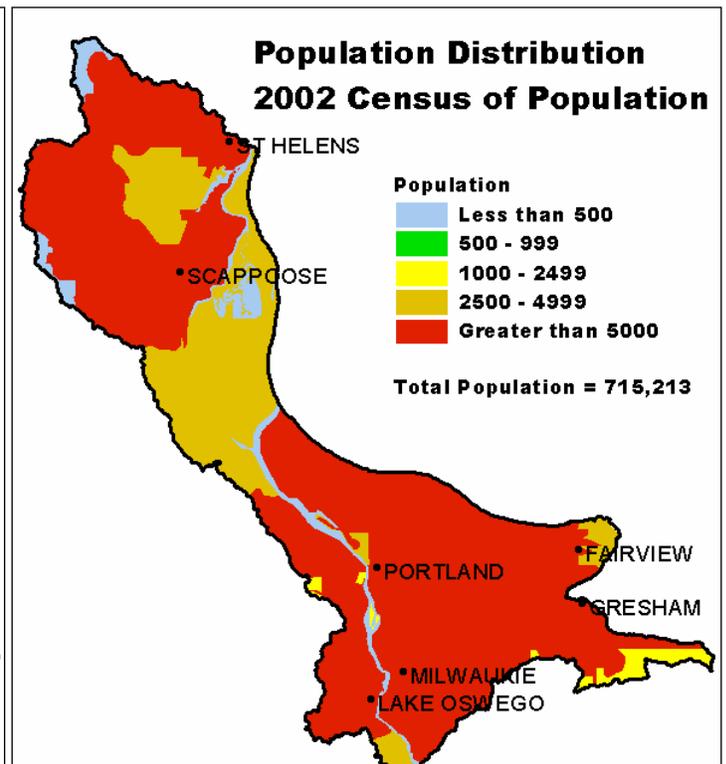
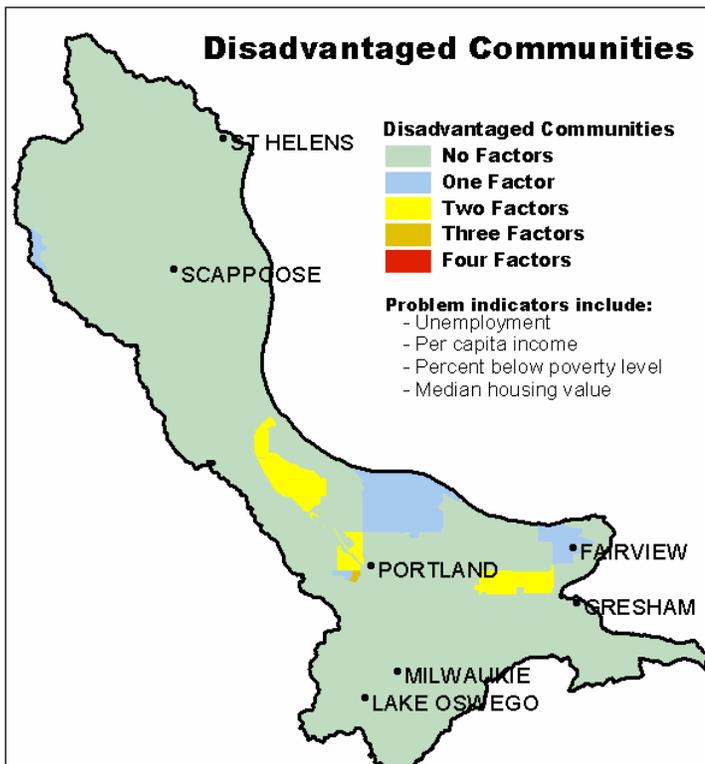
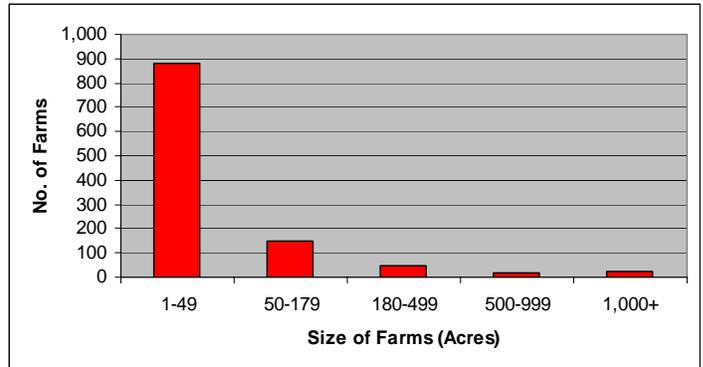
- Full-Time Operators: **526**
- Part-Time Operators: **1,334**

Estimated Level of Willingness and Ability to Participate in Conservation^{/15}: **LOW TO MODERATE**

Generally, agricultural landowners in the watershed are well educated and have a positive stewardship attitude. However, to increase conservation participation many will need substantial technical assistance to overcome a lack of management experience, understand the effect of their operation on local resource problems, and to appreciate the benefits of conservation. A majority of the operators' primary occupation is not agriculture. Thus, these people have difficulty finding the *time* to plan and implement conservation on their land.

Evaluation of Social Capital^{/16}: **LOW TO MODERATE SOCIAL CAPITAL**

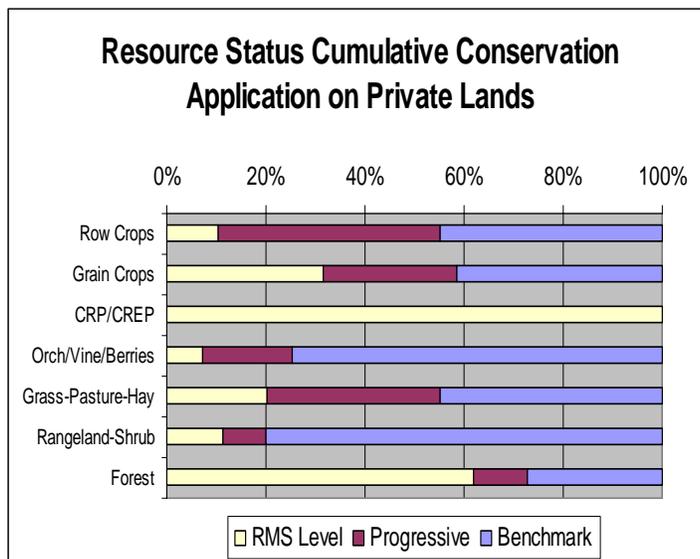
The communities in the watershed have adequate leadership and some experience working together to solve problems, but community leadership and experience is largely in the urban areas. Rural communities might be better able to promote conservation and assist their residents adopt conservation systems if community development efforts were to focus on increasing public participation in community groups, expanding the awareness of natural resource issues throughout the rural community, and initiating locally-led planning efforts.



Progress/Status

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PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg/Year	Total
Total Conservation Systems Planned (Acres)	4,845	424	115	128	44	1,111	5,556
Total Conservation Systems Applied (Acres)	3,880	430	1,394	5	38	1,149	5,747
Conservation Treatment Acres							
Waste Management (number)	2	0	0	0	2	1	4
Riparian Forest Buffers (acres)	0	259	3	2	5	54	269
Erosion Control (acres)	1,763	97	12	0	150	404	2,022
Irrigation Water Management (acres)	424	207	38	22	0	138	691
Nutrient Management (acres)	1222	0	313	22	75	326	1,632
Pest Management (acres)	490	236	393	1	97	243	1,217
Prescribed Grazing (acres)	527	202	134	4	118	197	985
Trees & Shrubs (acres)	789	131	33	1	49	201	1,003
Conservation Tillage (acres)	295	122	139	0	0	111	556
Wildlife Habitat (acres)	2,375	555	1,224	3	117	855	4,274
Wetlands (acres)	2	224	475	0	142	169	843



Estimates are based on information received from local conservationists in the watershed.

- ❖ Progress over the last five years has been focused on:
 - ~ Erosion control, nutrient and pest management on cropland.
 - ~ Wildlife habitat management on riparian and upland areas.
- ❖ Row crop farmers typically rely upon crop consultants representing canneries and fertilizer dealers
- ❖ Farmers who grow perennial crops such as nursery stock and Christmas trees usually do not seek assistance from NRCS or SWCDs.
- ❖ Much of the pasture that is at the benchmark level is located on small farms.
- ❖ Private industrial forest owners typically do not work with NRCS and SWCDs; however, their lands usually comply with state forest practices act.
- ❖ Much of the range and forest land in the watershed is on farms less than 50 acres and is not managed for forage or timber. Frequently, these non-industrial private forest lands do not comply with the state forest practices act.

Lands Removed from Production through Farm Bill Programs

- ❖ Conservation Reserve Program (CRP): **none**
- ❖ Wetland Restoration Program (WRP): **294 acres**
- ❖ Conservation Reserve Enhancement Program (CREP): **58 acres**

Footnotes/Bibliography

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

1. Ownership Layer – Source: The 1:24,000 scale public ownership layer is the land ownership/management for public entities, Federal, Tribal, State, and Local. This will be a seamless, statewide Oregon Public Ownership vector layer composed of fee ownership of lands by Federal, State, Tribal, County, and City agencies. The layer will be comprised of the best available data compiled at 1:24,000 scale or better and linework will match GCDB boundary locations and ORMAP standards where possible. The layer is available from the State of Oregon GIS Service Center: <http://www.gis.state.or.us/data/alphalist.html>. For current ownership status, consult official records at appropriate federal, state or county offices. Ownership classes grouped to calculate Federal Ownership vs. Non-Federal Ownership by the Water Resources Planning Team.
2. National Land Cover Dataset (NLCD) - Originator: U.S. Geological Survey (USGS) Publication_Date: 19990631, Title: Oregon Land Cover Data Set, Edition: 1, Geospatial_Data_Presentation_Form: raster digital data, Publication_Information: Publication_Place: Sioux Falls, SD USA, Publisher: U.S. Geological Survey, Online_Linkage: <http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html>, Description: Abstract: 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. The State data sets are provided with a 300 meter buffer beyond the State border to facilitate combining the State files into larger regions.
3. 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 due to 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/>
4. Irrigated Adjudicated Water Rights – Water Rights Information System (WRIS), Oregon Water Resources Department, <http://www.wrd.state.or.us/maps/wrexport.shtml>
5. StreamNet 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](#). Streamnet provided data and data services in support of the region's Fish and Wildlife Program and other efforts to manage and restore the region's aquatic resources. Official Streamnet website: <http://www.streamnet.org/>
6. Natural Resource Conservation Service, Watershed Projects Planned and Authorized, <http://www.nrcs.usda.gov/programs/watershed/Purpose>.
7. Natural Resource Conservation Service, Watershed Plans, Studies and Assessments completed, http://www.nrcs.usda.gov/programs/watershed/Surveys_Plng.html#Watershed%20Surveys%20and%20Plan
8. Oregon Department of Environmental Quality Total Maximum Daily Loads, <http://www.deq.state.or.us/wq/TMDLs/TMDLs.htm>
9. Oregon Department of Agriculture, Agricultural Water Quality Management Plans, http://www.oregon.gov/ODA/NRD/water_agplans.shtml

Footnotes/Bibliography Continued

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10. Oregon Watershed Enhancement Board, <http://oregon.gov/OWEB/WSHEDS/index.shtml>
11. Watershed Assessments completed by local watershed councils following the Oregon Watershed Assessment Manual, http://oregon.gov/OWEB/docs/pubs/ws_assess_manual.shtml.
12. NRCS Field Office Technical Guide, Section II, Threatened and Endangered List.
13. Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265. As amended through October 11, 1996.
14. Data were taken from the 2002 Agricultural Census and adjusted by percent of HUC in the county or by percent of zip code area in the HUC, depending on the level of data available. Data were also taken from the U.S. Population Census, 2000.
15. Conservation participation was estimated using NRCS Social Sciences Technical Note 1801, [Guide for Estimating Participation in Conservation](#), 2004. Four categories of indicators were evaluated: Personal characteristics, Farm structural characteristics, Perceptions of conservation, and Community context. Estimates are based on information received from local conservationists in the watershed.
16. Social capital is an indicator of the community's ability and willingness to work together to solve problems. A high degree of social capital helps a community to be physically healthy, socially progressive, and economically vigorous. Low amounts of social capital typically result in community conflict, lack of trust and respect, and unsuccessful attempts to solve problems. The evaluation used NRCS Technical Report Release 4.1, March, 2002: [Adding Up Social Capital: An Investment in Communities](#). Local conservationists provided information to measure social capital. Scores range from 0 to 76.
17. [Surface and Groundwater Resource Protection Map](#)
 - a. 2002 303d Listed Streams designated by Oregon Department of Environmental Quality and approved by the Environmental Protection Agency, Section 303d Clean Water Act, <http://www.deq.state.or.us/wq/303dlist/303dpage.htm>
 - b. Groundwater Management Areas designated by the Oregon Department of Environmental Quality, Oregon Revised Statutes – Ground Water ORS 468B.150 to ORS 468B.190, <http://www.deq.state.or.us/wq/groundwa/wqgw.htm>
 - c. Groundwater Restricted Areas designated by Oregon Water Resources Commission, Oregon Department of Water Resources, http://egov.oregon.gov/OWRD/PUBS/aquabook_protections.shtml
 - d. The Sole Source Aquifer (SSA) Protection Program is authorized by Section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S.C. 300 et. seq), <http://www.epa.gov/safewater/ssanp.html>
18. Subbasin assessments and plans are developed by local groups (SWCDs, Watershed Councils, Tribes and others) as part of the Northwest Power and Conservation Council's fish and wildlife program in the Columbia River Basin. This program is funded and implemented by the Bonneville Power Administration. <http://www.nwcouncil.org/fw/subbasinplanning/Default.htm>.