Lower Columbia/Sandy
17080001

8-Digit Hydrologic Unit Profile

FINAL

SEPTEMBER 2005

Introduction

The Lower Columbia/Sandy 8-Digit Hydrologic Unit Code (HUC) subbasin *in Oregon* is comprised of 365,500 acres. It extends into Clackamas and Multnomah Counties. Eighty-nine percent of the subbasin is forestland, four percent is under grass/hay/pasture, and the remaining agricultural land is used for row crops, orchards, vineyards, Christmas trees, nursery stock, and various berries and nuts. Resource concerns associated with these land uses include streambank erosion, soil compaction, surface water contamination, and invasive, noxious weeds. Social concerns include the need for a high level of management for conservation, high labor costs, increasing land use restrictions, and other public, rural-urban interface controversies.

There are 592 farms in the subbasin with 967 operators. Only 2 percent of the farms are more than 180 acres in size, and 83 percent are less than 50 acres. Most operators are aware of local resource concerns and the connection to management of their operation. Large acreage operators tend to have more experience and resources with which to adopt conservation systems. Small acreage operators, which are much more numerous, require substantial technical assistance and incentives to adopt conservation systems.

Conservation assistance is provided by two NRCS service centers, three soil and water conservation districts, one resource conservation and development (RC&D) office, and other local conservation organizations.

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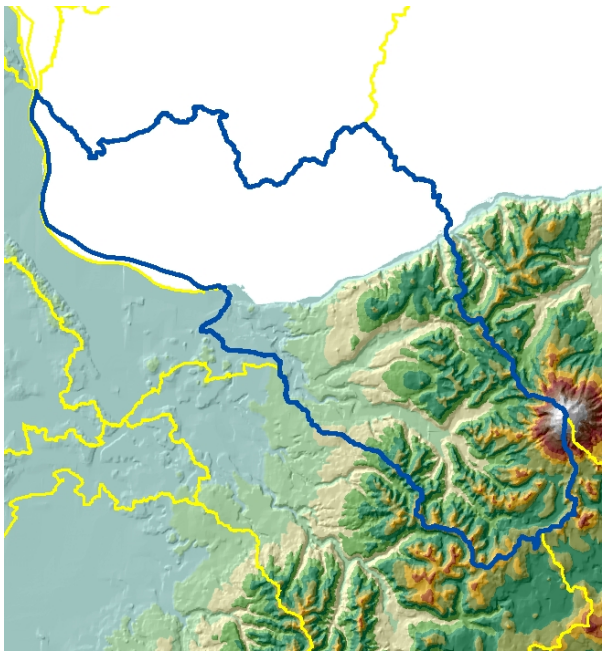
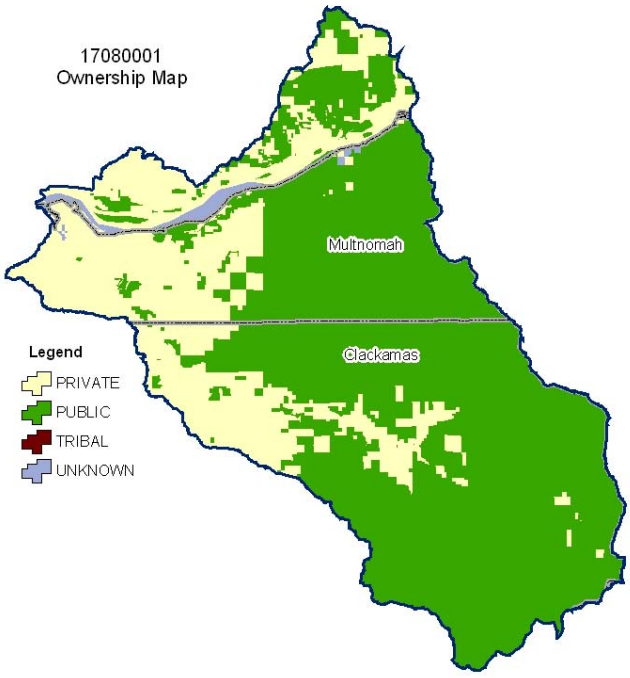
Relief Map





Produced by the Water Resources Planning Team Portland, OR

Physical Description

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ALL NUMBERS IN THIS PROFILE ARE FOR OREGON ONLY

Land Cover/Land Use (NLCD[12])	Ownership - (2003 Draft BLM Surface Map Set[11])							
	Public		Private		Tribal		Totals	%
	Acres	%	Acres	%	Acres	%		
Forest	260,200	71%	66,200	18%	0	0%	**326,900**	**89%**
Grain Crops	*	---	*	---	0	0%	*	---
Conservation Reserve Program Land [a]	0	0%	0	0%	0	0%	**0**	**0%**
Grass/Pasture/Hay	3,400	1%	10,500	3%	0	0%	**13,900**	**4%**
Orchards/Vineyards	*	---	*	---	0	0%	*	---
Row Crops	*	---	*	---	0	0%	*	---
Shrub/Rangelands	3,700	1%	*	---	0	0%	**5,500**	**1%**
Water/Wetlands/Developed/Barren	7,600	2%	7,200	2%	0	0%	**15,300**	**4%**
Oregon HUC Totals [b]	**274,900**	**75%**	**89,600**	**25%**	**0**	**0%**	**365,500**	**100%**

**: Less than 1 percent of total acres. See below for special considerations.*
a: Estimate from Farm Service Agency records and includes CRP/CREP.
b: Totals are approximate due to rounding and small unknown acreages.

Special Considerations for this 8-Digit HUC:

- Thirty-one percent of the private forestland is under industrial forest ownership.
- Cole crops, such as cabbage and broccoli, are grown on a few acres on rolling hills in vicinity of Corbett and Sandy.
- Orchards/Vineyards/Nurseries includes other perennial crops, such as nursery stock (greenhouse and in-ground) and Christmas trees.
- Pasture and hay are associated with ranchettes and small farm operations.

Irrigated Lands (1997 NRI[13] Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	1,300	22%	0%
	Uncultivated Cropland	1,000	17%	0%
	Pastureland	3,500	60%	1%
	Total Irrigated Lands	**5,800**	**100%**	**1.5%**

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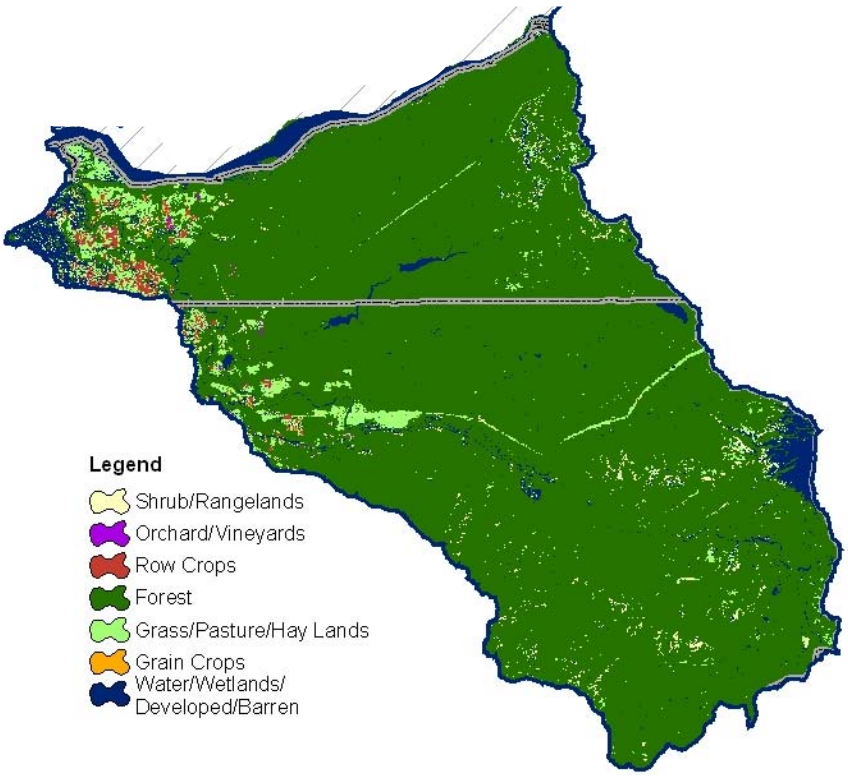
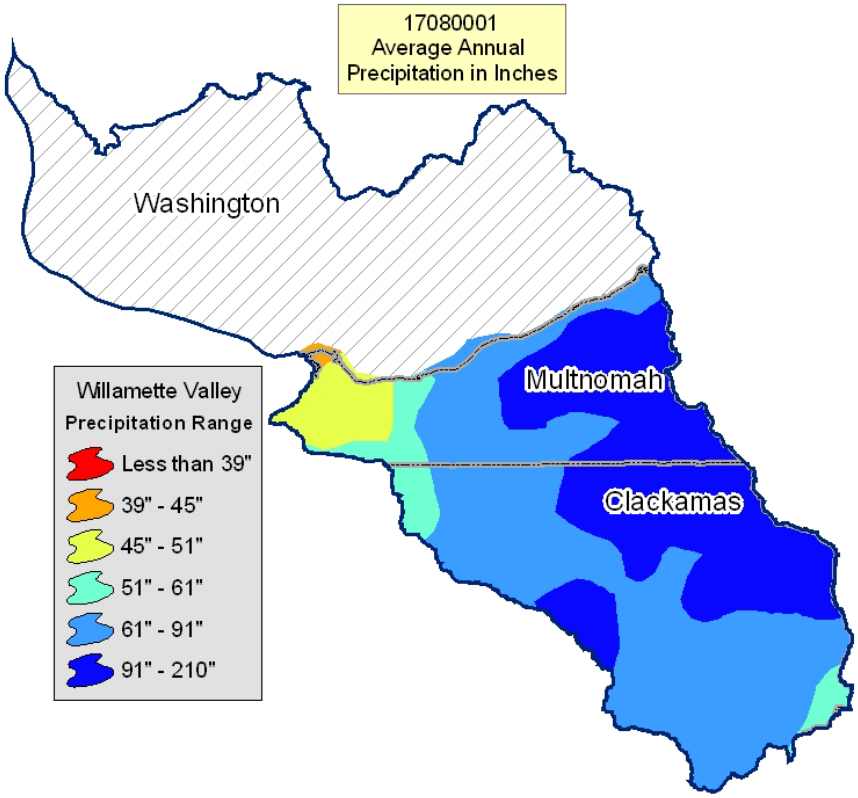
17080001
Land use/Land cover Map





Common Resource Area Map

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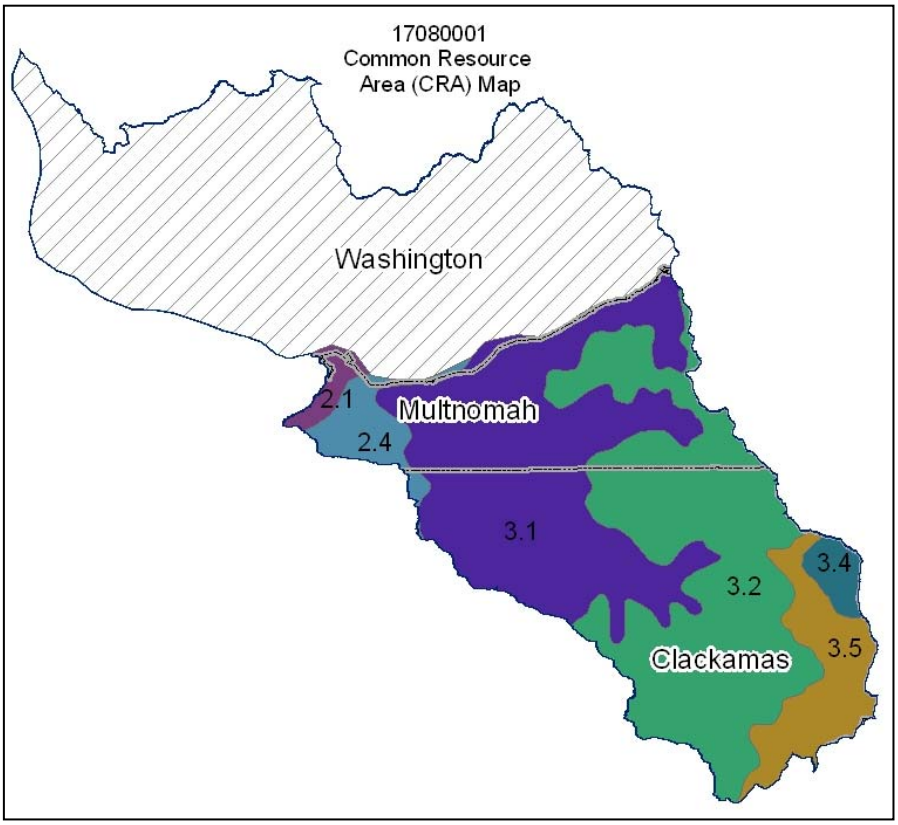
Only the major units are described below - for descriptions of all units within the HUC, go to: http://ice.or.nrcs.usda.gov/website/cra/viewer.htm



2.4 – Willamette and Puget Valleys - Valley Foothills: This unit is comprised of the foothills of the Willamette Valley. The soils are underlain by basalt and sedimentary rock and are typically red and clayey. The vegetation is Douglas fir and Oregon white oak. The temperature regime is mesic, and the moisture regime is xeric. The unit does not support western hemlock, which is characteristic of the adjacent units in the Coast and Cascade MLRA's.

3.1 - Olympic and Cascade Mountains - Western Cascades Lowlands and Valleys: This unit comprises the lower elevations of the Cascade Mountains, adjacent to the Valley Foothills unit (2.4). The soils are underlain by basalt, andesite, and rhyolite. The vegetation is Douglas fir and western hemlock. This unit is one of the most important timber-producing areas in the Northwest. The temperature regime is mesic, and the moisture regime is udic.

3.2 - Olympic and Cascade Mountains - Western Cascades Montane Highlands: This unit comprises the middle to high elevations of the Cascade Mountains. The vegetation is Douglas fir, western hemlock, mountain hemlock, Pacific silver fir, and noble fir. Elevation is typically more than about 3,000 feet. The mountains are highly dissected and have steep slopes. The temperature regime is frigid and "warm" cryic, and the moisture regime is udic. The unit normally has a deep annual snowpack.

3.5 - Olympic and Cascade Mountains - Northern Cascade Crest Montane Forest: This unit consists of an undulating plateau punctuated by volcanic buttes and cones that reach a maximum elevation of about 6,500 feet. It is extensively forested with mountain hemlock and Pacific silver fir. The temperature regime is cryic, and the moisture regime is udic. Although this unit has the same moisture and temperature regime as unit 3.3, this unit is noticeably moister and the break between units 3.3 and 3.5 is transitional.

Physical Description – Continued

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		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	1,227	3,068
	Well	156	389
	Total Irrigated Adjudicated Water Rights	1,071	2,678
Stream Flow Data	USGS 14142500 SANDY RIVER BLW BULL RUN RIVER, NEAR BULL RUN, OR	**Total Avg. Yield**	1,652,436
		May – Sept. Yield	388,947
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	646	---
	303d/TMDL Listed Streams (DEQ)	66	10%
	Anadromous Fish Presence (StreamNet)	74	11%
	Bull Trout Presence (StreamNet)	0	0%
		ACRES	**PERCENT**
Land Cover / Use[2] Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer	Forest	16,807	90%
	Grain Crops	10	0%
	Grass/Pasture/Hay	369	2%
	Orchards/Vineyards	4	0%
	Row Crops	113	0%
	Shrub/Rangelands – Includes CRP Lands	235	1%
	Water/Wetlands/Developed/Barren	1,194	6%
	Total Acres of 100-foot Stream Buffers	**18,731**	**---**
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	900	3%
	3 – severe limitations	17,800	67%
	4 – very severe limitations	0	0%
	5 – no erosion hazard, but other limitations	0	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	7,700	29%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	0	0%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%
	Total Croplands & Pasturelands	**26,400**	**---**

Confined Animal Feeding Operations – Oregon CAFO Permit – 12/2004

Animal Type	Dairy	Feedlot	Poultry	Swine	Mink	Other
No. of Permitted Farms	0	0	0	0	0	0
No. of Permitted Animals	0	0	0	0	0	0

Resource Concerns

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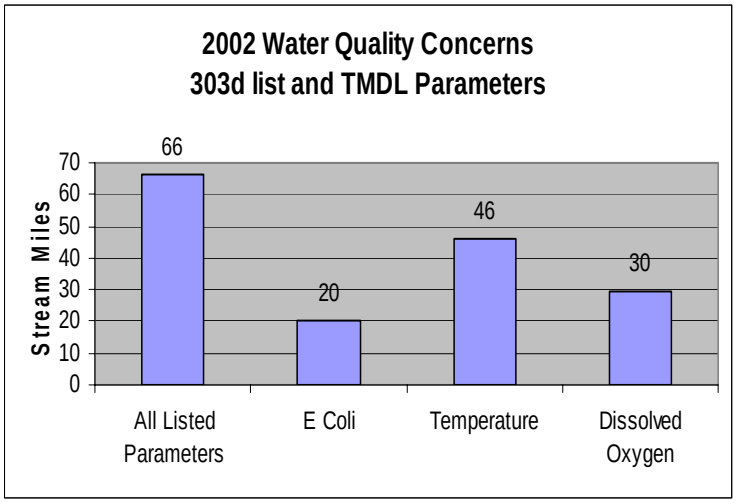
Tons of Soil Loss by Water Erosion: Due to the limited amount of non-Federal cropland and pastureland within this HUC, no reliable NRI soil loss estimates are available.



- Over 50 percent of the listed stream miles exceed State water quality standards for temperature. Elevated stream temperatures may be due to inadequate riparian shade, stream channel widening, and other anthropogenic or natural causes.
- E Coli can be an indication of livestock waste runoff, but it also is typical of poorly functioning onsite sewage disposal systems.
- Conservation practices that can be used to address these water quality issues include grazing management and use of riparian buffers.

Watershed Projects, Plans, Studies, and Assessments			
NRCS Watershed Projects[6]		**NRCS Watershed Plans, Studies, and 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/Snake Rivers	Completed Draft for Review	Lower Columbia-Sandy	Completed

OWEB Watershed Council[10]	**Watershed Council Assessments**[11]	**NWPCC Subbasin Plans and Assessments**[18]
Sandy Basin Watershed Council	Sandy River Basin Watershed Council Phase 1 Watershed Assessment, Fairview Creek Watershed Assessment	Sandy and Lower Columbia Subbasin Plans

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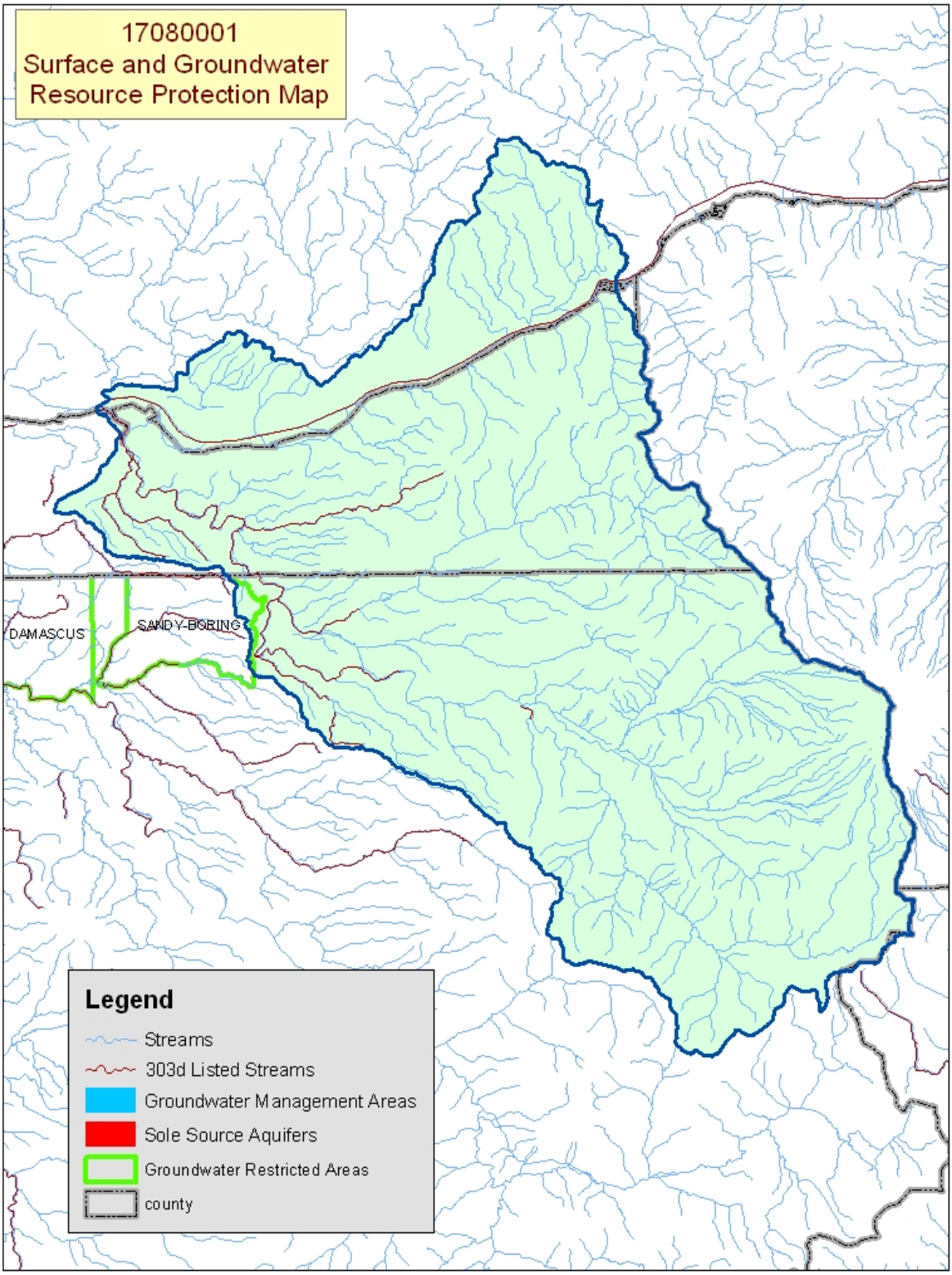

Map Footnote [17]

Resource Concerns - Continued

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Resource Concerns / Issues by Land Use							
SWAPA +H Concerns	**Specific Resource Concern / Issue**	**Grass \ Pasture \ Hay**	**Grain Crops**	**Row Crops**	**Perennial Crops (Xmas / Nursery / Berries)**	**Shrub / Range**	**Forest**
Soil Erosion	Sheet & Rill			X	X		
	Concentrated Flow or Gully			X	X		
	Streambank	X					X
	Soil Mass Movement						X
Soil Condition	Tilth, Crusting, Infiltration, Organic Matter			X	X		
	Soil Compaction	X					X
Soil Contamination	Excess Fertilizers & Pesticides			X	X		
Water Quantity	Water Management For Irrigated Land				X		
Water Quality, Surface	Pesticides			X	X		
	Nutrients & Organics	X					
	Suspended Sediments & Turbidity			X	X		
	Temperature	X		X	X		
	Aquatic Habitat Suitability	X		X	X		X
Plant Condition	Productivity, Health, & Vigor	X					X
Human, Economics	Land Use Constraints/Restrictions	X		X	X		X
	High Labor Costs or Availability			X	X		
	High Management Level Required	X					X
Human, Political	High Degree of Controversy			X			X

Pasture / Hay

- Forage and grazing management issues are common on pastureland on small farms and ranches.
- Proper waste management is needed for livestock operations to maintain water quality and avoid soil contamination associated with nutrients and pathogens around the livestock headquarters.

Row & Perennial Crops

- Management of residue, nutrients, and pests and use of filter strips and buffers are needed to control erosion and protect water quality. Irrigation water management is an issue for irrigated crops in groundwater restricted areas.
- Cole and nursery crops are associated with sheet and rill and concentrated flow erosion, especially during harvesting.
- Smoke from burning stubble after harvesting sometimes creates issues for health and safety.
- Adopting integrated pest management in lieu of use of chemicals on high-valued orchards and vineyards is an economic risk.

Forest

- On non-industrial forestland, landowner objectives commonly for aesthetic value, not timber production.

General

- Land use constraints and pressure to develop hinders investment in conservation. Viable production agriculture in the watershed is diminishing.
- Increasing land values and conflicting urban-rural land uses raise serious social, political, and economic concerns for resource management in the watershed.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES[12]	
THREATENED SPECIES	**CANDIDATE SPECIES**
Mammals-Columbian white-tailed deer, Canada lynx **Birds –** Bald eagle, Northern spotted owl **Fish –** Chum salmon, Steelhead, Chinook salmon, Sockeye salmon, Bull trout **Plants –** Golden paintbrush, Willamette daisy, Howellia, Bradshaw's lomatium, Kincaid's lupine, Nelson's checker-mallow	**Birds –** Yellow-billed cuckoo, Streaked horned lark **Amphibians and Reptiles –** Oregon spotted frog **Fish –** Coho salmon **PROPOSED SPECIES** None
ESSENTIAL FISH HABITAT[13] **-** Chinook	

Census and Social Data[/14]

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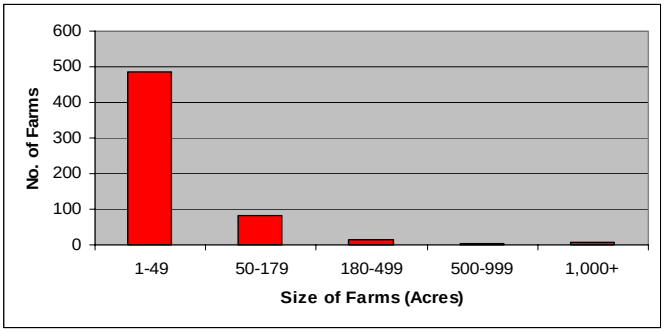


Number of Farms: 592

Number of Operators: 967

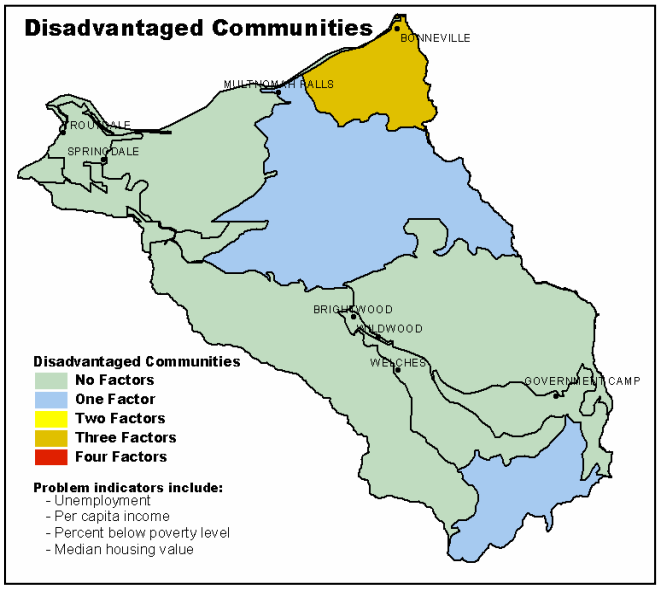
- Full-Time Operators: **175**
- Part-Time Operators: **792**

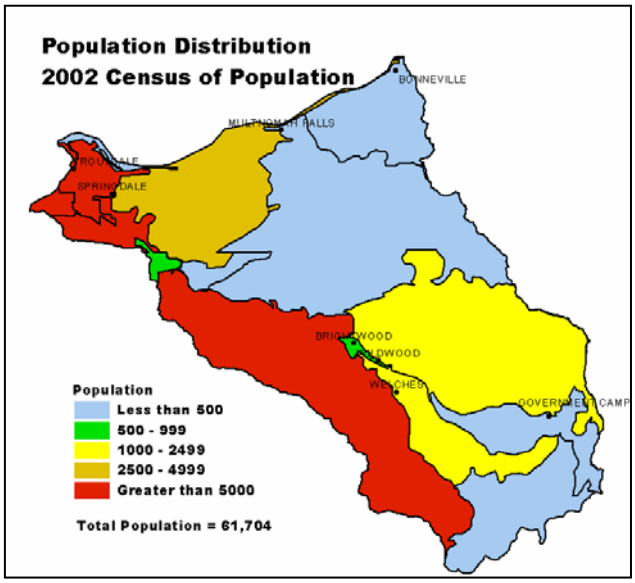
Estimated Level of Willingness and Ability to Participate in Conservation[/15]: Moderate

Most operators are aware of local resource concerns and the relevance of their operation to those concerns. Larger acreage operators are more likely to have a conservation plan and experience in implementing resource management systems. Newer, smaller acreage (less than 50 acres) landowners generally have less experience managing natural resources and require significantly more technical assistance to adopt conservation systems. Most farms in the subbasin are in good financial health; therefore, while financial assistance is an important incentive to promote conservation, it may not be as critical a factor as perhaps recommending conservation systems that are easier and less time-consuming to install, operate, and maintain.

Evaluation of Social Capital[/16]: Low to Moderate

Social capital in the Lower Columbia/Sandy subbasin and the community's ability to successfully address local resource concerns appear to be low to moderate. The community's greatest strength is that it frequently has numerous volunteers for community projects. The community would benefit from increasing public participation from all residents in community decisions. To accomplish this, community leaders and conservationists need to present resource management as a significant communitywide issue.





Progress/Status

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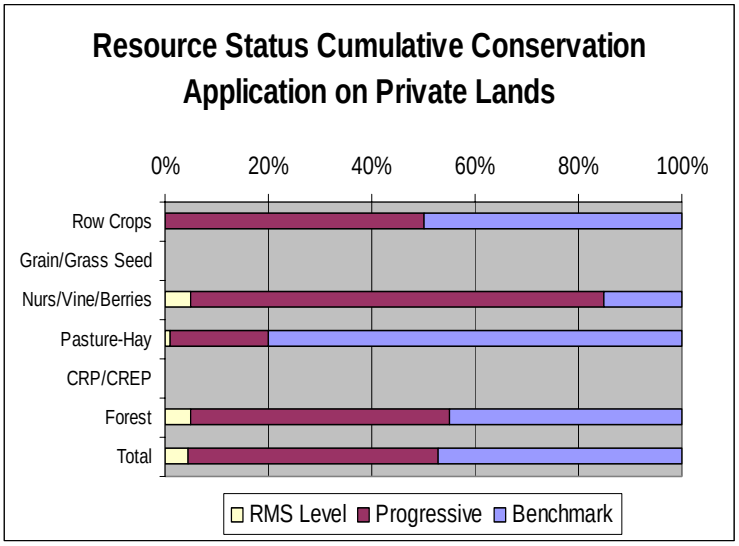
PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg/Year	Total
Total Conservation Systems Planned (Acres)	0	0	0	238	13	50	251
Total Conservation Systems Applied (Acres)	0	0	0	55	0	11	55
Conservation Treatment Acres							
Waste Management (Number)	0	0	0	0	1	0	1
Buffers (Acres)	0	0	0	52	1	11	53
Erosion Control (Acres)	0	0	0	22	0	4	22
Irrigation Water Management (Acres)	0	0	0	55	0	11	55
Nutrient Management (Acres)	0	0	0	55	57	22	112
Pest Management (Acres)	0	0	5	80	140	45	225
Prescribed Grazing (Acres)	0	0	0	0	60	12	60
Trees & Shrubs (Acres)	0	15	0	5	7	5	27
Conservation Tillage (Acres)	0	0	0	0	0	0	0
Wildlife Habitat (Acres)	3	0	0	129	0	26	132
Wetlands (Acres)	0	0	0	165	40	41	205



- Progress over the last 5 years has been focused on:
  - Nutrient and pest management on cropland.
  - Wildlife habitat management in riparian areas and on uplands.
- The complexity of continuous production of cole crops leaves few options for controlling erosion.
- Farmers producing perennial crops, such as nursery stock and Christmas trees, commonly do not seek assistance from NRCS or SWCDs.
- Much of the pasture that is at the benchmark level is on small farms.
- Private industrial forestland owners typically do not work with NRCS and SWCDs; however, their land usually complies with State forest practice requirements.
- Much of private non-industrial forestland is on farms that are less than 50 acres in size and are not managed for forage or timber production.

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

Lands Removed from Production through Farm Bill Programs

- Conservation Reserve Program (CRP): **None**
- Wetland Restoration Program (WRP): **None**
- Conservation Reserve Enhancement Program (CREP): **None**

Footnotes/Bibliography

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1. Ownership Layer – Source: The 1:24,000 scale public ownership layer is the land ownership/management for public entities, including Federal, Tribal, State, and local entities. This is a seamless, statewide Oregon Public Ownership vector layer composed of fee ownership of lands by Federal, State, Tribal, county, and city agencies. The layer is comprised of the best available data compiled at 1:24,000 scale or larger, and the line work matches 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, and 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; Publisher: U.S. Geological Survey, Sioux Falls, SD, USA; Online linkage: http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html; 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 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/

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 Resources Conservation Service, Watershed Projects Planned and Authorized, http://www.nrcs.usda.gov/programs/watershed/Purpose.

7. Natural Resources 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 amount of social capital helps a community to be physically healthy, socially progressive, and economically vigorous. A low amount of social capital typically results in community conflict, lack of trust and respect, and unsuccessful attempts to solve problems. The evaluation is based on 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.