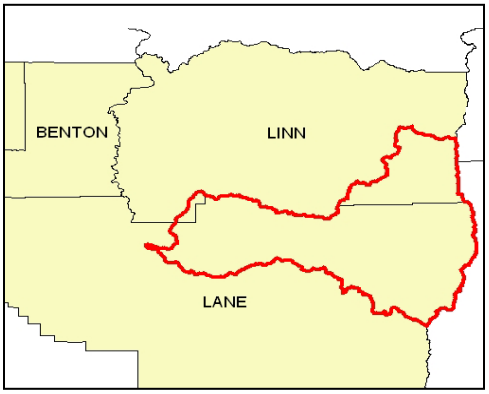
McKenzie – 17090004

8-Digit Hydrologic Unit Profile

FINAL

SEPTEMBER 2005



Introduction

The McKenzie 8-Digit Hydrologic Unit Code (HUC) subbasin consists of 856,000 acres, most of which is forestland and pastureland in Lane County (80 percent) and Linn County. Seventy percent is public land, and the other thirty percent is private land.

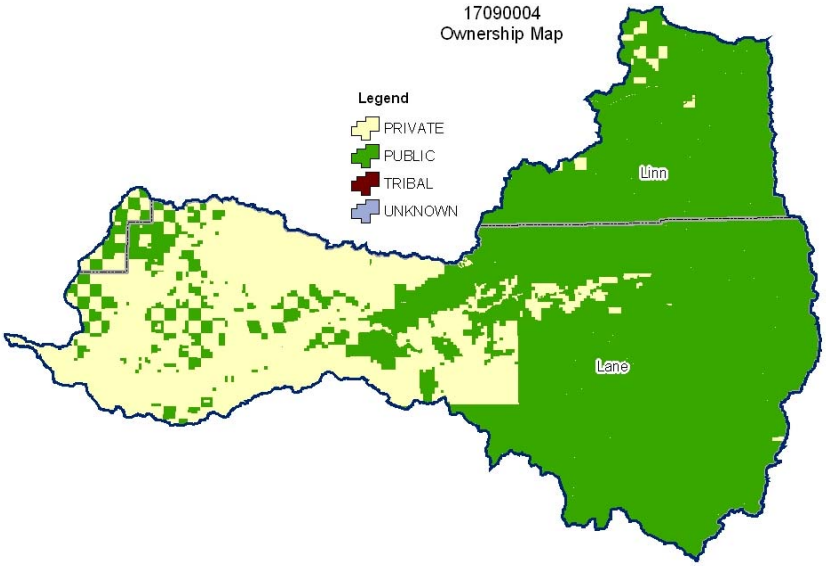
The main resource concerns on the forestland and pastureland are water quality and invasive weeds. There is a high degree of controversy concerning forest management. Most of the residents in the McKenzie subbasin believe that the watershed is healthy and they want to keep it that way; however, the controversy arises over how to maintain a healthy subbasin.

There are 351 farms and ranches in the subbasin. Seventy-five percent of the farms are less than 50 acres in size, and many of the landowners of these small farms are hobby farmers seeking a rural lifestyle. Most of the remaining land is private, industrial forestland.

Two NRCS service centers, five soil and water conservation districts, one soil survey office, the Cascade Pacific resource conservation and development (RC&D) office, and other partnerships and organizations provide conservation assistance in the McKenzie subbasin.

Profile Contents

Relief Map



Produced by the Water Resources Planning Team Portland, OR

Physical Description

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Land Cover/Land Use (NLCD[12])	Ownership - (2003 Draft BLM Surface Map Set[11])							
	Public		Private		Tribal		Totals	%
	Acres	%	Acres	%	Acres	%		
Forest	545,200	64%	213,100	25%	0	0%	**758,300**	**89%**
Grain Crops	*	---	*	---	0	0%	*	---
Conservation Reserve Program Land [a]	0	0%	*	---	0	0%	*	---
Grass/Pasture/Hay	14,200	2%	33,000	4%	0	0%	**47,200**	**6%**
Orchards/Vineyards/Berries	0	0%	*	---	0	0%	*	---
Row Crops	*	---	*	---	0	0%	*	---
Shrub/Rangelands	8,700	1%	*	---	0	0%	**11,300**	**1%**
Water/Wetlands/Developed/Barren	30,600	4%	5,300	1%	0	0%	**35,900**	**4%**
Oregon HUC Totals [b]	**598,700**	**70%**	**257,200**	**30%**	**0**	**0%**	**855,900**	**100%**

**: Less than one 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:

- Eighty-nine percent of the private forestland is under industrial forest ownership (OSU, Forestry Sciences Laboratory).
- Grain commonly is grown in rotation with grass seed and other crops.
- Orchards/Vineyards/Berries includes 85 percent filberts and 5 percent berries. The remainder includes other perennial crops such as mint, nursery stock, and Christmas trees (Pacific Northwest Ecosystem Research Consortium).
- Grass/Pasture/Hay includes approximately (Pacific Northwest Ecosystem Research Consortium):
  - ~ 300 acres of grass seed turf
  - ~ 5,800 acres of pasture
  - ~ 1,900 acres of hay
- Pasture includes small beef operations as well as small farms and ranches with horses.
- Urban land occupies 17,000 acres.
- There is tremendous development pressure throughout the entire watershed, especially on pastureland.
- The Mohawk River watershed, which is within the McKenzie subbasin, has a preponderance of small hobby farms. Consequently, it has resource concerns there that are not endemic to the entire watershed.

Irrigated Lands (1997 NRI[13] Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	1,300	34%	0%
	Uncultivated Cropland	0	0%	0%
	Pastureland	2,500	66%	0%
	Total Irrigated Lands	**3,800**	**100%**	**0%**

(Continued on the following pages)

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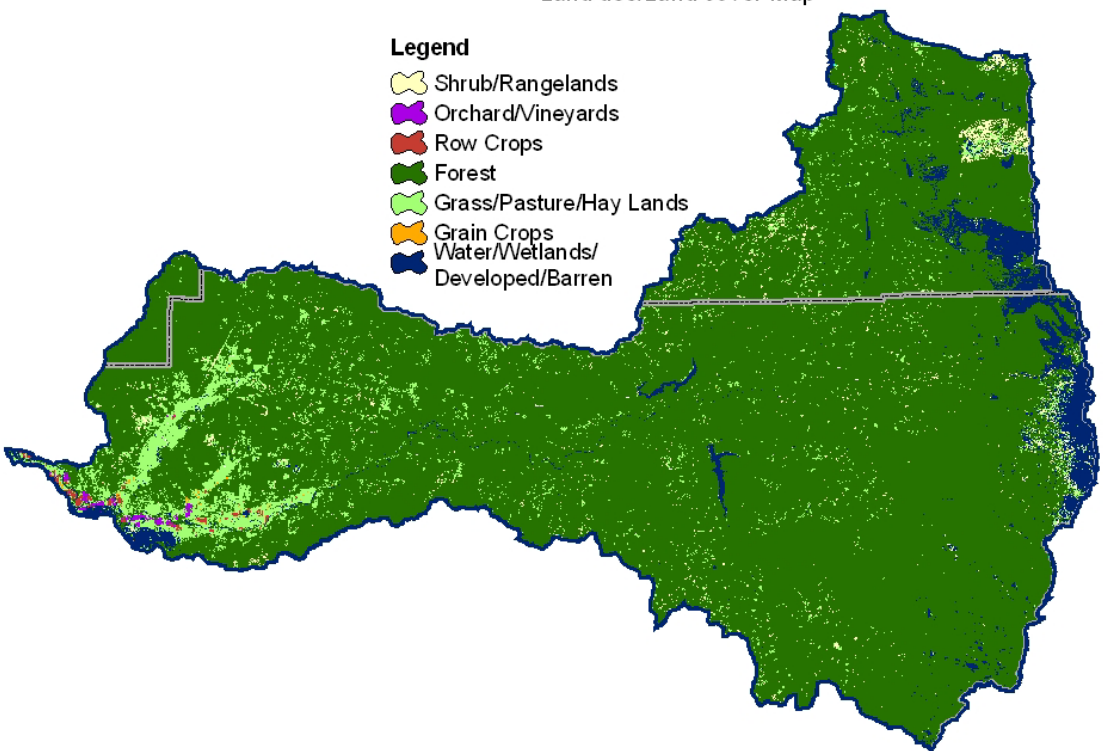
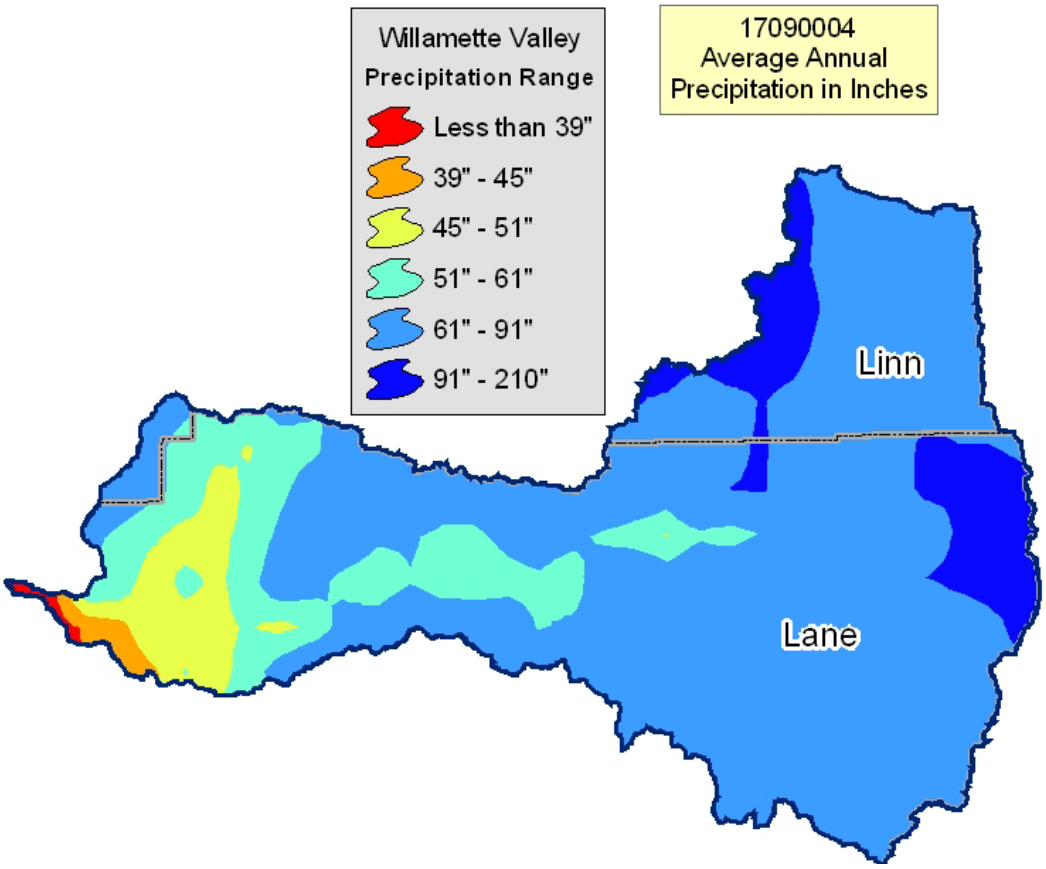
17090004
Land use/Land cover Map





Common Resource Area Map

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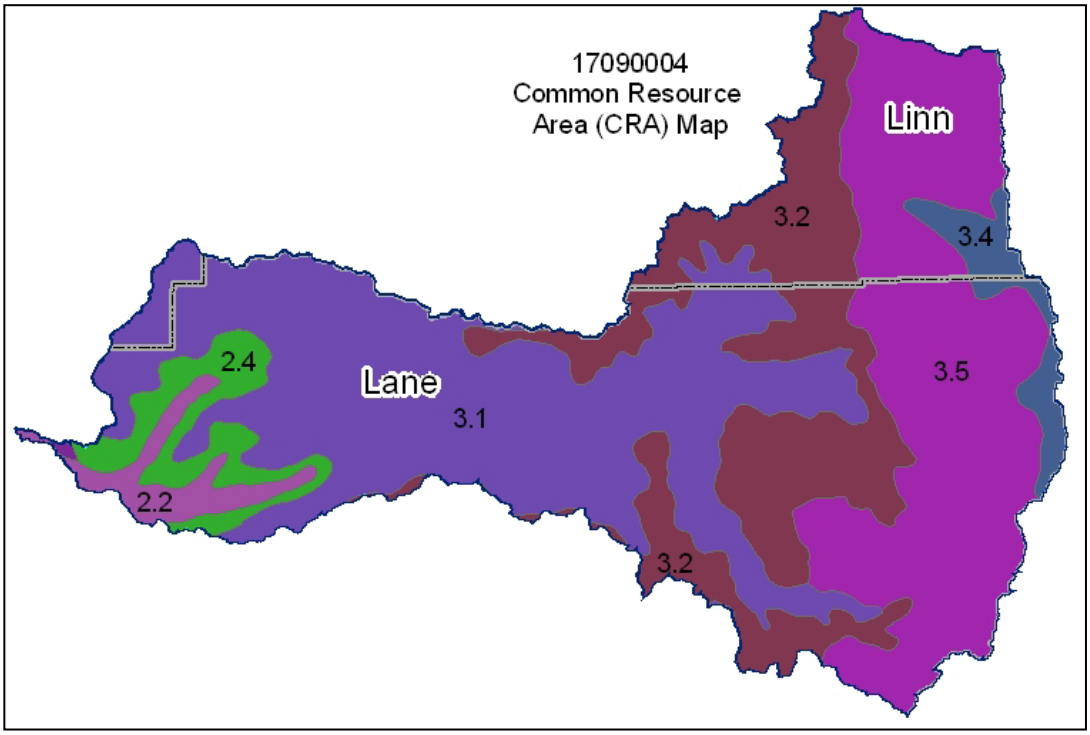
Only the major units are described below - for descriptions of all units within the HUC, go to: http://ice.or.nrcs.usda.gov/website/cra/viewer.htm



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 dominantly Douglas fir and Oregon white oak. The temperature regime is mesic, and the moisture regime is xeric. The unit does not support western hemlock, although western hemlock is characteristic of the adjacent units in the Coast and Cascade MLRAs.

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 area (2.4). The bedrock consists of basalt, andesite, and rhyolite. The vegetation is dominantly 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 Cascades. The vegetation is dominantly 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.

3.4 - Olympic and Cascade Mountains - Cascade Subalpine-Alpine: This unit is an area of high, glaciated, volcanic peaks that rise above subalpine meadows. It is characterized by barren rock outcroppings, lava flows, and volcanic peaks. Elevation ranges from 5,600 to 12,000 feet. Active glaciation occurs on the highest volcanoes, decreasing from north to south. The winters are very cold, and the growing season is extremely short. Flora and fauna adapted to the high elevations include herbaceous and shrubby subalpine meadow vegetation and scattered patches of mountain hemlock, subalpine fir, and whitebark pine.

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. The unit 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 regimes as unit 3.3, this unit is noticeably more moist 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	6,495	16,367
	Well	1,886	4,753
	Total Irrigated Adjudicated Water Rights	8,381	21,120
Stream Flow Data	USGS 14165500 MCKENZIE RIVER, NEAR COBURG,OR	**Total Avg. Yield**	4,281,483
		May – Sept. Yield	1,109,853
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	1,201	---
	303d/TMDL Listed Streams (DEQ)	174	14%
	Anadromous Fish Presence (StreamNet)	90	7%
	Bull Trout Presence (StreamNet)	149	12%
		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	27,956	87%
	Grain Crops	20	0%
	Grass/Pasture/Hay	2,102	7%
	Orchards/Vineyards	88	0%
	Row Crops	50	0%
	Shrub/Rangelands – Includes CRP Lands	300	1%
	Water/Wetlands/Developed/Barren	1,388	4%
	Total Acres of 100-foot Stream Buffers	**31,902**	---
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	5,000	36%
	2 – moderate limitations	5,800	42%
	3 – severe limitations	0	0%
	4 – very severe limitations	1,200	9%
	5 – no erosion hazard, but other limitations	0	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	1,900	14%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife	0	0%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%
	Total Croplands & Pasturelands	**13,900**	---

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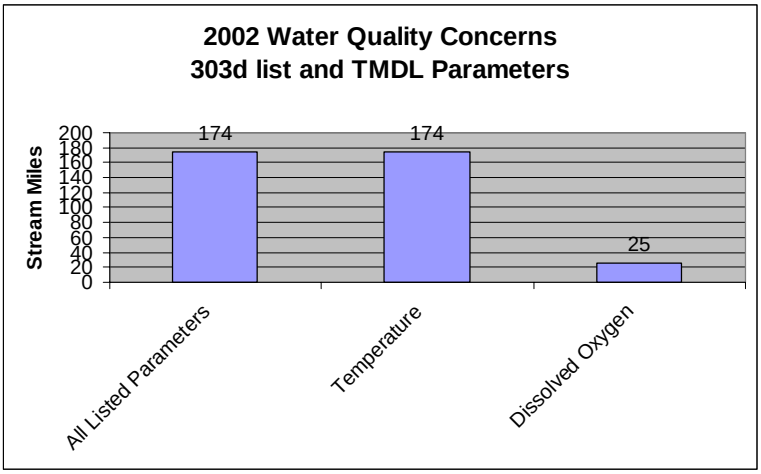
Tons of Soil Loss by Water Erosion: Due to the limited amount of non-Federal cropland and pastureland within this HUC, no reliable NRI soil loss estimates are available.



- All 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.
- Conservation practices that can be used to address these water quality issues include livestock waste management, grazing management, nutrient and pest 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**
Willakenzie Area	Installed – 1959	Mohawk River Watershed Assessment	Completed 2000
ODEQ TMDL's[8]		**ODA Agricultural Water Quality Management Plans**[9]	
Name	**Status**	**Name**	**Status**
Willamette Basin	Completed	Southern Willamette Valley	Completed
OWEB Watershed Council[10]	**Watershed Council Assessments**[11]	**NWPCC Subbasin Plans and Assessments**[18]	
McKenzie Watershed Council, Mohawk Watershed Partnership	Mohawk Watershed Assessment (Supplemental)	Willamette Subbasin Plan	

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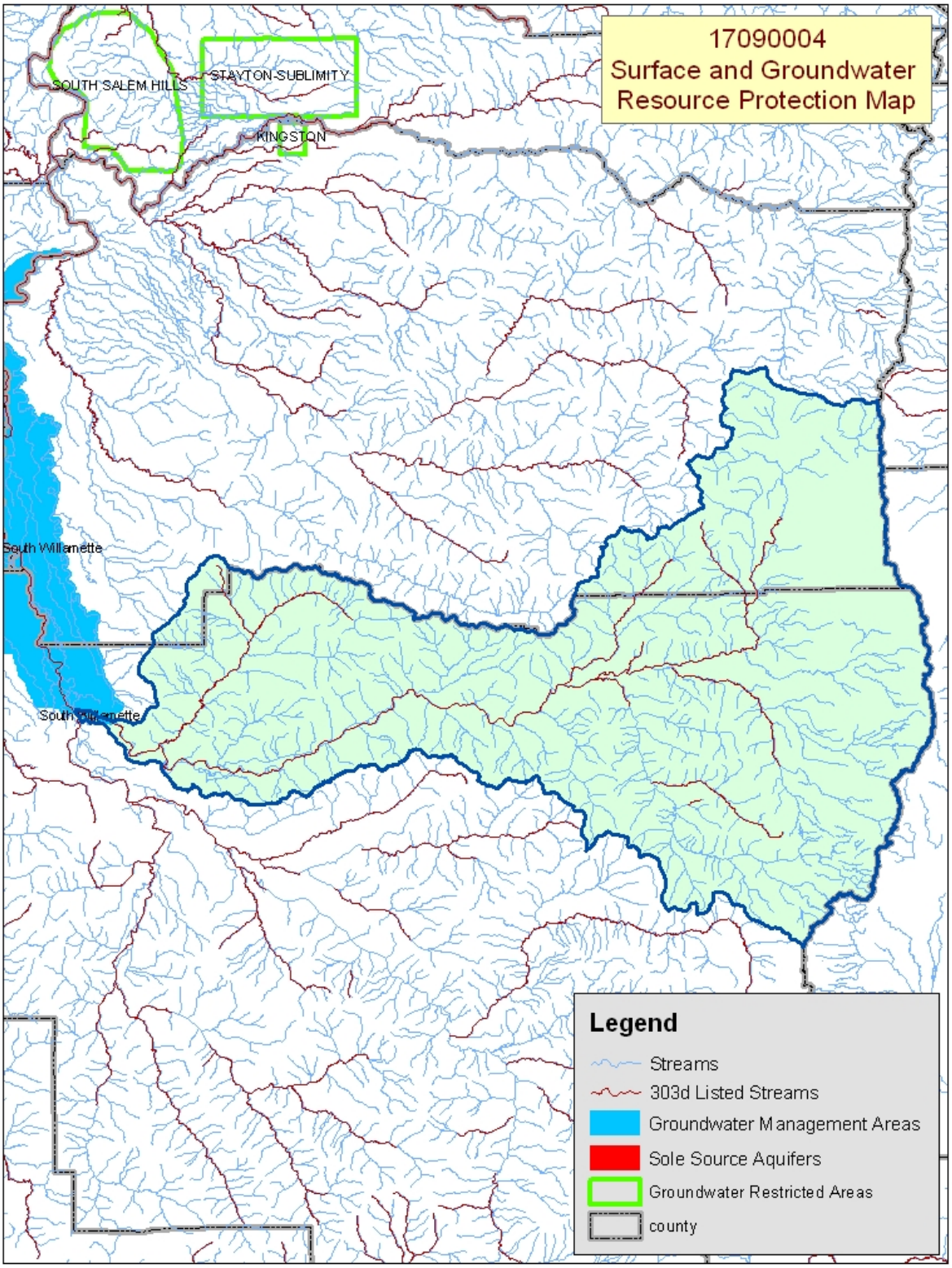

Map Footnote [17]

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 (Orch / Vine / Berries)**	**Wetlands / Riparian**	**Forest**
Soil Erosion	Streambank	X					
Soil Condition	Soil Compaction	X					
Water Quantity	Ponding & Flooding	X					
Water Quality, Surface	Nutrients & Organics	X	X	X			
	Low Dissolved Oxygen	X	X	X		X	X
	Temperature	X	X	X		X	X
Plant Suitability	Site & Intended Use Suitability	X				X	X
Plant Management	Establishment, Growth, & Harvest	X					
Animal Habitat, Domestic	Management	X					
Animal Habitat, Wildlife	Water - Quantity & Quality					X	
Human, Economics	High Risk & Uncertainty			X			
	High Management Level Required	X					
	Low or Unreliable Profitability	X					
Human, Political	High Degree of Controversy	X				X	X

Grass / Pasture / Hay

- Ponding and flooding are a concern on small farms in the Mohawk watershed.
- Many small hobby farms are on pastureland. Landowners work another job, have little resource management or agriculture experience, require considerable technical assistance outside of normal business hours, and can be difficult to contact.
- Pressure for development and urban encroachment are significant problems in areas of pastureland near cities and towns.
- The agriculture community and infrastructure is disappearing.

Grain, Row, & Perennial Crops

- Residue, nutrient, and pest management and use of filter strips and buffers are necessary to control erosion and maintain water quality.

Rangeland & Forestland

- The presence of invasive noxious weeds as a result in large part of poor management is a concern, especially in areas of small acreage operations.

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

Census and Social Data[/14]

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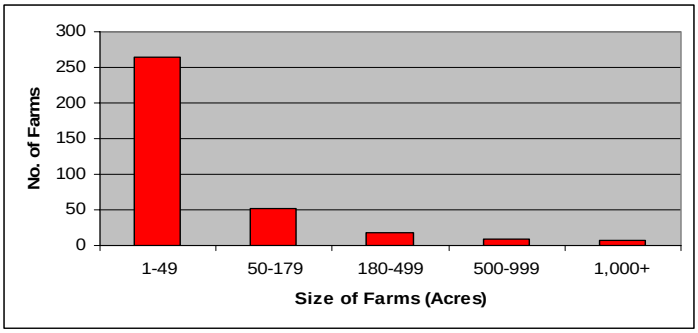
Number of Farms: 351

Number of Operators: 589

- Full-Time Operators: **175**
- Part-Time Operators: **414**



Estimated Level of Willingness and Ability to Participate in Conservation[/15]: High for production agriculture operators and Low for small hobby farm operators

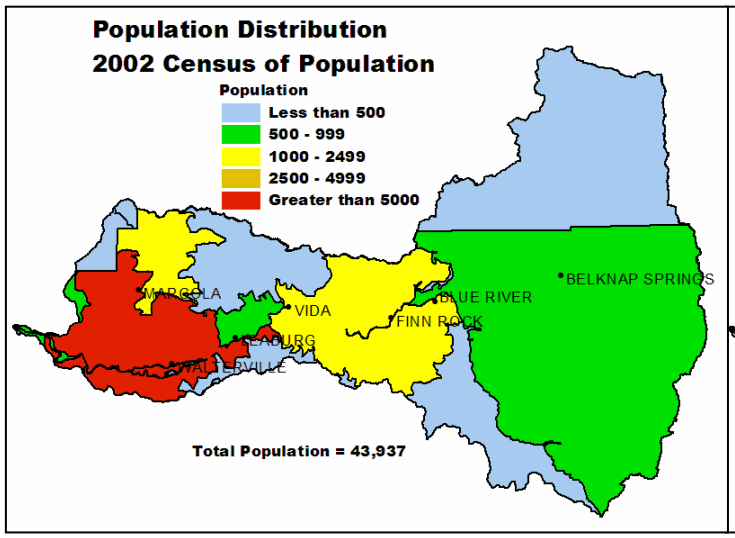
Full-time operators of viable agricultural operations tend to be amenable to conservation. These operators are aware of local resource concerns and have a fair idea of what can be done on their operation to address these concerns, but they could benefit from some technical assistance and considerable financial assistance.

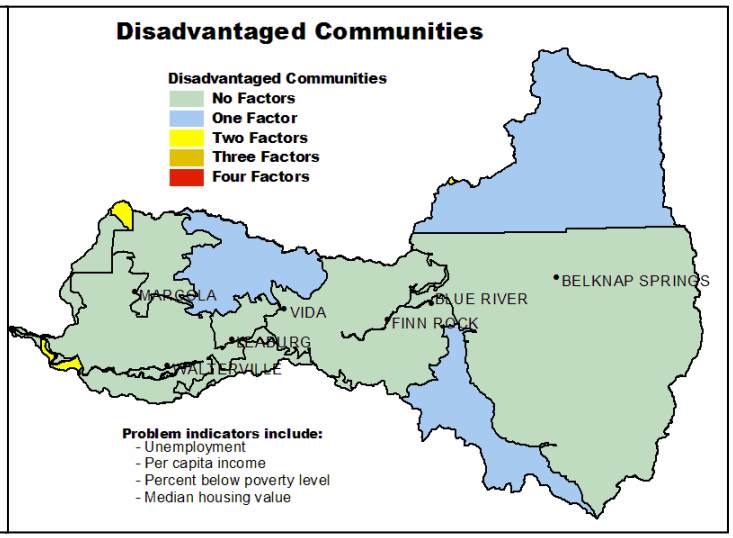
Owners of smaller hobby farms (not necessarily intended to be economically viable) are generally aware of local resource concerns and relatively agreeable to adopting some conservation measures to improve resource management. These landowners, however, also tend to lack agricultural and resource management experience; consequently, they require significant technical assistance and frequently are only available on weekends and in evenings. Furthermore, these landowners may not receive the financial benefits of conservation that a larger production operation might and thus may need additional financial incentives.

Evaluation of Social Capital[/16] Moderate

Social capital and the ability of the community to successfully address the local resource concerns are perceived to about average. The community's greatest strengths are its leadership, its likelihood of *completing* community projects, its ability to acquire government assistance for community projects, the strong local media coverage, and the number of citizens that exercise their right to vote.

The community might improve its understanding of agriculture and its ability to get conservation on the ground by increasing its participation and involvement in agricultural organizations. Likewise, the agricultural community (both large-acreage and small-acreage landowners) might increase community support for its conservation activities by more actively participating in local resource and environmental organizations.





Progress/Status

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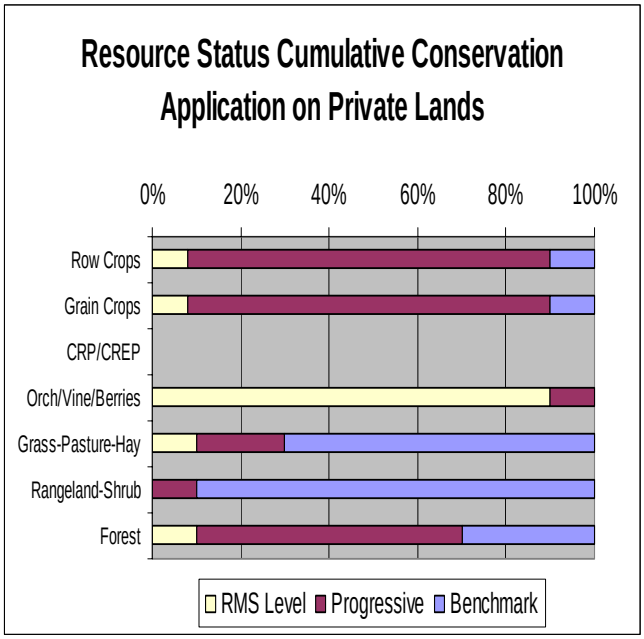
PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg/Year	Total
Total Conservation Systems Planned (Acres)	500	1,227	2,010	1,456	2,011	1,441	7,204
Total Conservation Systems Applied (Acres)	0	87	557	751	1,939	667	3,334
Conservation Treatment Acres							
Waste Management (Number)	0	0	0	0	2	0	2
Buffers (Acres)	2	11	4	42	4	13	63
Erosion Control (Acres)	0	0	0	0	0	0	0
Irrigation Water Management (Acres)	0	60	157	118	487	164	822
Nutrient Management (Acres)	0	180	245	457	807	338	1,689
Pest Management (Acres)	0	99	119	333	540	218	1,091
Prescribed Grazing (Acres)	0	87	176	452	353	214	1,068
Trees & Shrubs (Acres)	9	0	0	0	0	2	9
Conservation Tillage (Acres)	0	33	33	0	402	94	468
Wildlife Habitat (Acres)	0	11	502	556	54	225	1,123
Wetlands (Acres)	0	0	0	85	0	17	85



- Progress over the last 5 years has been focused on:
  - Nutrient and pest management on CAFOs and cropland.
  - Prescribed grazing on pastureland.
  - Wildlife habitat management in riparian and wetland areas.
- Farmers of row crops (e.g. corn, beans, and cole crops) commonly rely on crop consultants that represent canneries and fertilizer dealers. Most are implementing some conservation practices but not necessarily at the RMS level.
- Farmers of perennial crops (berries, vineyards, nursery stock, etc.) commonly do not seek assistance from NRCS or SWCDs but are meeting RMS quality criteria.
- Much of the pasture that is at the benchmark level is on small farms.
- Rangeland-Shrub includes idle land, vacant areas, or barren slopes that commonly are not being grazed nor used for other agricultural purposes.
- Private industrial forestland owners typically do not work with NRCS and SWCDs; however, they commonly comply with State forest practices act standards.
- Much of the non-industrial, private forestland is not managed for forage or timber and does not comply with State forest practices act standards.

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

Lands Removed from Production through Farm Bill Programs

- Conservation Reserve Program (CRP): **17 acres**
- Wetland Restoration Program (WRP): **69 acres**
- Conservation Reserve Enhancement Program (CREP): **47 acres**

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.