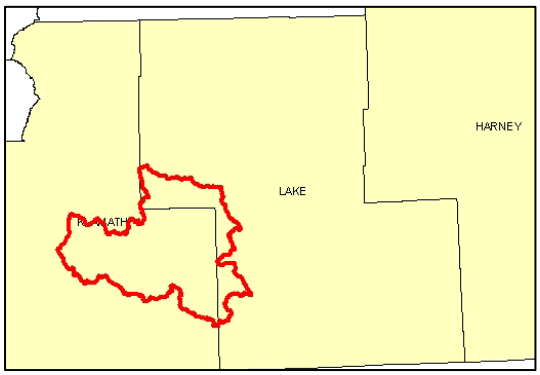
Sprague – 18010202

8-Digit Hydrologic Unit Profile

FINAL

OCTOBER 2005



Introduction

The Sprague 8-Digit Hydrologic Unit Code (HUC) subbasin is comprised of 1,029,700 acres in Klamath and Lake Counties. Sixty-eight percent of the subbasin is forestland. The remainder is largely grass/pasture/hayland, range, water and wetlands. Resource concerns include streambank erosion, diminishing water quality and aquatic habitat, noxious weeds, and poor grazing practices and irrigation water management. Historically, controversial social, political, and economic issues have severely hampered the diffusion of conservation in the subbasin. However, there are of late, increasingly more occurrences of cooperation leading to improved resource management.

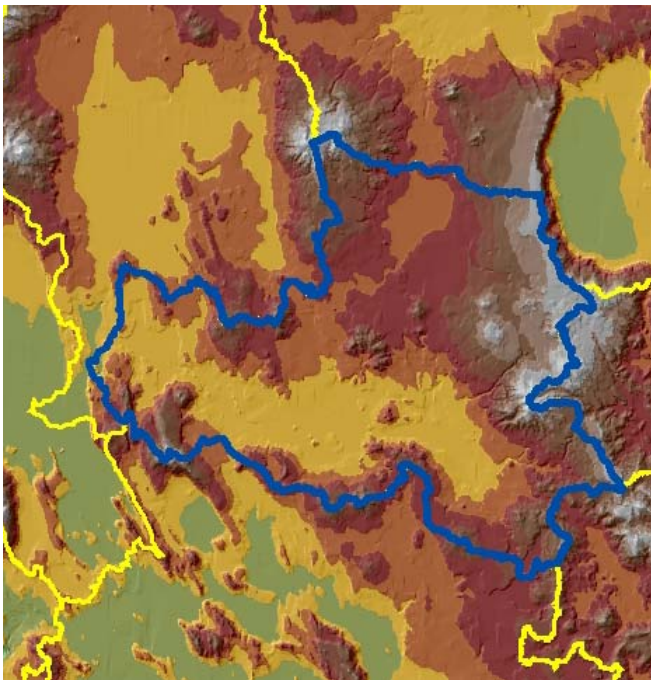
There are 221 farms and ranches, and 365 farmers/ranchers in the subbasin. Generally, the farms and ranches are viable operations, in fair to good financial health. Most operators are aware of local resource concerns and have positive stewardship attitudes. However, only recently have resources been available to aggressively encourage the adoption of conservation systems. With community support the diffusion of conservation in the subbasin is expected to increase.

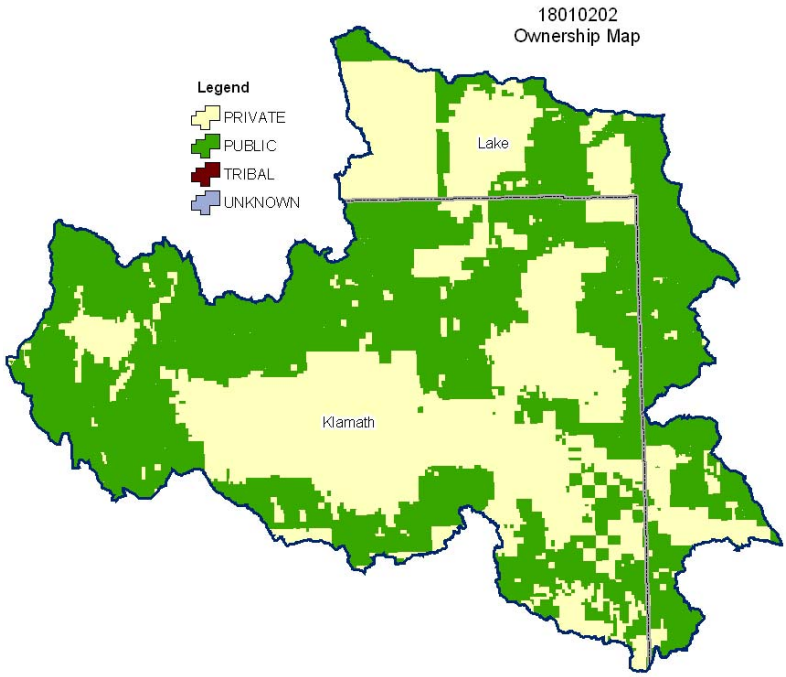
The Klamath Falls and Lakeview NRCS Service Centers, three Soil and Water Conservation Districts, Klamath Watershed Council, and other local conservation organizations provide conservation assistance in the subbasin.

Profile Contents

Introduction
Physical Description
Land Use Map & Precipitation Map
Common Resource Area
Resource Concerns
Census and Social Data
Progress/Status
Footnotes/Bibliography

Relief Map





Produced by the Water Resources Planning Team Portland, OR

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Physical Description

Back to Contents

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	474,000	46%	225,200	22%	0	0%	699,200	68%
Grain Crops	*	--	*	--	0	0%	*	--
Conservation Reserve Program Land [a]	0	0%	*	--	0	0%	*	--
Grass/Pasture/Hay	18,900	2%	59,000	6%	0	0%	77,900	8%
Orchards/Vineyards	0	0%	0	0%	0	0%	0	0%
Row Crops	*	--	*	--	0	0%	*	--
Shrub/Rangelands	86,400	8%	93,600	9%	0	0%	180,000	17%
Water/Wetlands/Developed/Barren	*	--	54,400	5%	0	0%	62,500	6%
Oregon HUC Totals [b]	**587,400**	**57%**	**442,400**	**43%**	**0**	**0%**	**1,029,800**	**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:

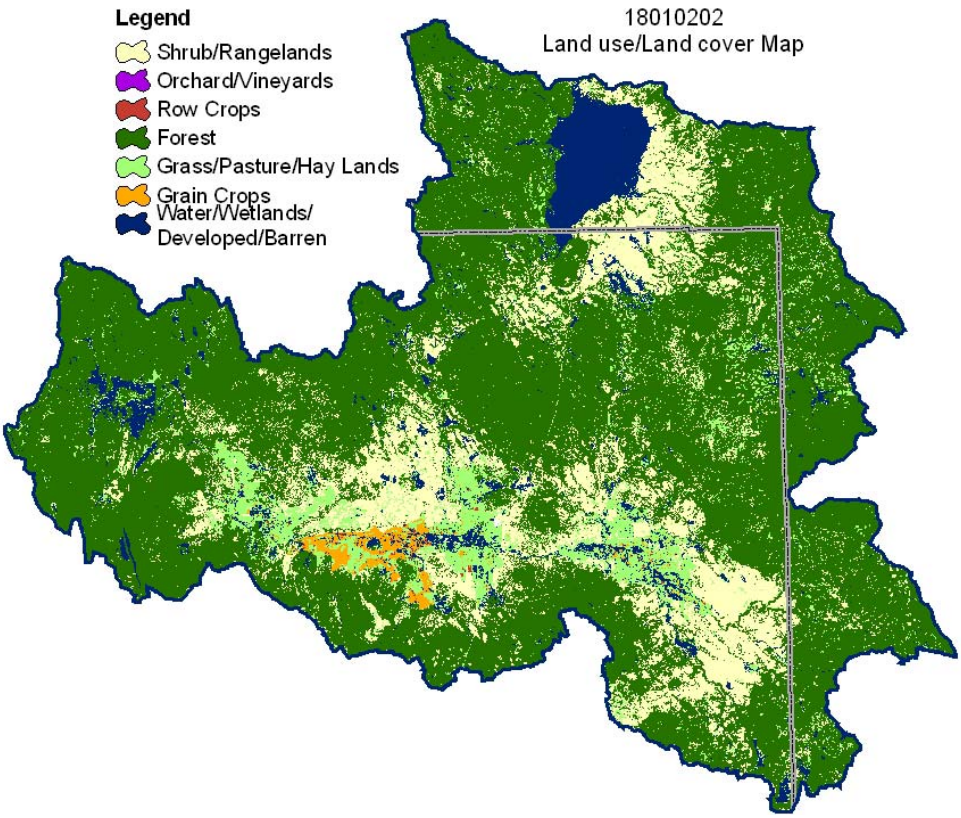
Based on the NRCS , Upper Klamath Basin Rapid Subbasin Assessments:

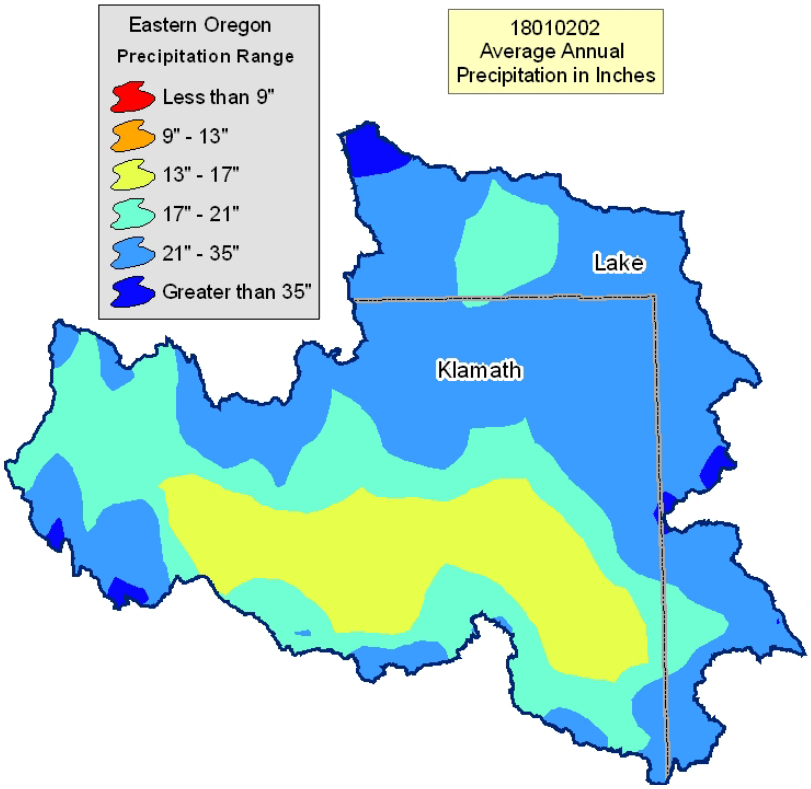
- 35 percent of private forest is in industrial forest ownership.
- 61,600 acres are irrigated mostly as pasture and grass hay.
- 20 percent of the rangeland is dominated by juniper.

Irrigated Lands (1997 NRI[13] Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	1,100	5%	<1%
	Uncultivated Cropland	9,900	43%	<1%
	Pastureland	12,100	52%	1%
	Total Irrigated Lands	**23,100**	**100%**	**2%**

(Continued on the following pages)

Back to Contents

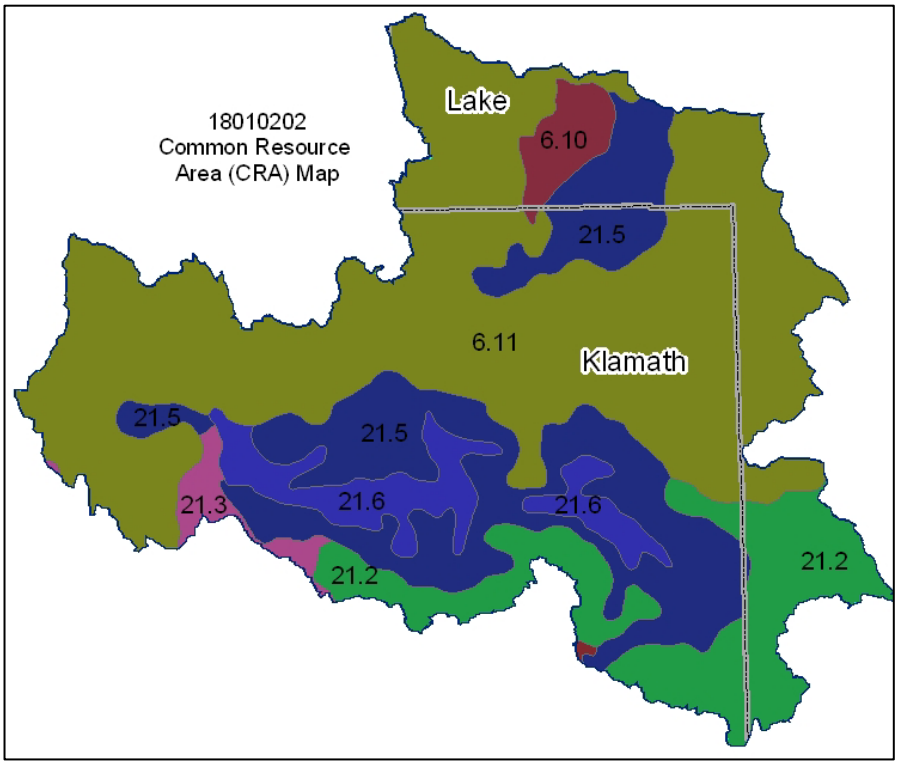




Common Resource Area Map

Back to Contents

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



6.10 – Cascade Mountains, Eastern Slope - Cold Wet Pumice Plateau Basins: This unit is characterized by cold wet basins. The soils are dominated by ash and pumice from Mt. Mazama with extensive wetlands in Klamath and Sycan Marshes and groundwater quality issues in Lapine Basin. Temperature regime is cryic with aquic soil conditions.

6.11 – Cascade Mountains, Eastern Slope - Pumice Plateau Forest: This unit occurs on the southern extreme of the MLRA and is characterized by nearly level to undulating pumice mantled plateaus dominated by lodgepole pine and ponderosa pine. The soils consist of deep deposits of ash and pumice from Mt. Mazama. Cold temperatures and frost limit the production of ponderosa pine. Temperature regime is cryic; moisture regime is xeric.

21.2 – Klamath and Shasta Valleys and Basins - Fremont Pine-Fir Forest: This unit is characterized by forested mountains and plateaus in the eastern portion of the MLRA. Temperature regime is frigid with higher areas being cryic; moisture regime is xeric. Dominant soils are Rogger, Mound, Chocktoot and Hallihan. Vegetation is dominantly ponderosa pine and white fir with lodgepole pine in the higher areas.

21.3 - Klamath and Shasta Valleys and Basins - Southern Cascade Slope: This unit is characterized by forested mountains and plateaus in the western portion of the MLRA. Temperature regime is frigid; moisture regime is xeric. Dominant soils are Pinehurst, Greystoke, Woodcock and Royst. Vegetation is dominantly ponderosa pine, Douglas-fir, with some Shasta red fir. The major separation of unit 21.2 from 21.3 is about Bly Mountain. White fir dominates in unit 21.2 and Douglas-fir dominates in unit 21.3.

21.5 – Klamath and Shasta Valleys and Basins - Cool Klamath Juniper Woodland: This unit is characterized by rangeland on hills and mountains. Temperature regime is frigid; moisture regime is xeric. Dominant soils are Booth, Bullump and Merlin. Vegetation is dominated by mountain big sage, low sage and Idaho fescue. Precipitation is about 14 to 18 inches.

21.6 - Klamath and Shasta Valleys and Basins - Cold Floodplains and Basins: This unit is characterized by floodplains and terraces in cold basins. Temperature regime is cryic and frigid; moisture regime is xeric. This unit is in the Sprague River Valley. Due to cold temperatures, most areas are used for pasture or hayland. Dominant soils are Lather, Klamath, Ontko, Kirk and Chock.

Physical Description – Continued

Back to Contents

		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	35,417	105,887
	Well	23,344	69,981
	Total Irrigated Adjudicated Water Rights	58,762	175,867
Stream Flow Data	USGS 11501000 SPRAGUE RIVER NEAR CHILOQUIN, OR	**Total Avg. Yield**	422,126
		May - Sept Yield	150,508
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	751	--
	303d/TMDL Listed Streams (DEQ)	333	44%
	Anadromous Fish Presence (StreamNet)	0	0%
	Bull Trout Presence (StreamNet)	25	3%
		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	23,562	60%
	Grain Crops	847	2%
	Grass/Pasture/Hay	3,914	10%
	Orchards/Vineyards	0	0%
	Row Crops	50	0%
	Shrub/Rangelands – Includes CRP Lands	5,066	13%
	Water/Wetlands/Developed/Barren	5,686	15%
	Total Acres of 100-foot Stream Buffers	**39,124**	**--**
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	0	0%
	3 – severe limitations	0	0%
	4 – very severe limitations	29,900	100%
	5 – no erosion hazard, but other limitations	0	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	0	0%
	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	**29,900**	**--**

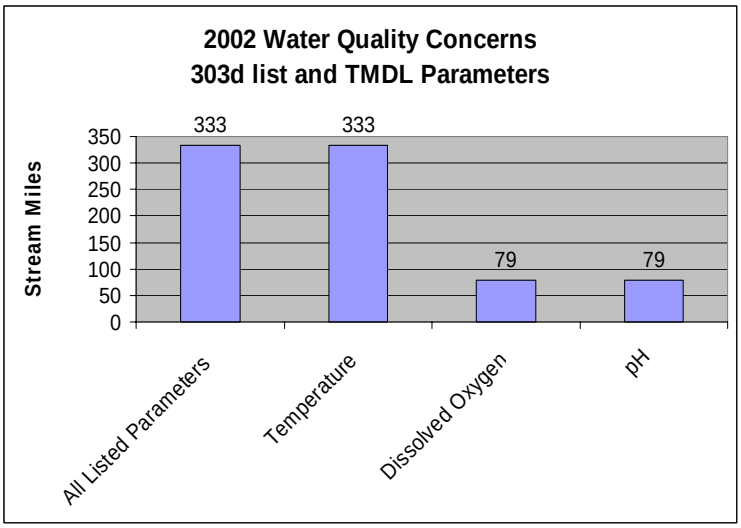
Confined Animal Feeding Operations – Oregon CAFO Permit – 12/2004

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

Back to Contents

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 stream temperatures. Elevated stream temperatures may be due to inadequate riparian shade, stream channel widening, and other anthropogenic or natural sources.
- DO and pH may be indicatative of high nutrient loading from agriculture and other sources.
- Conservation practices that can be used to address these water quality issues include irrigation water management, nutrient 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	Upper Klamath Subbasin Assessments (Sprague River)	Completed 2004

ODEQ TMDL's[8]		ODA Agricultural Water Quality Management Plans[9]	
Name	Status	Name	Status
Upper Klamath Lake Drainage	Completed	Klamath Headwaters	Completed

OWEB Watershed Council[10]	Watershed Council Assessments[11]	NWPCC Subbasin Plans & Assessments[18]
Klamath Watershed Council Sprague Watershed Working Group Sycan Watershed Council	None	None

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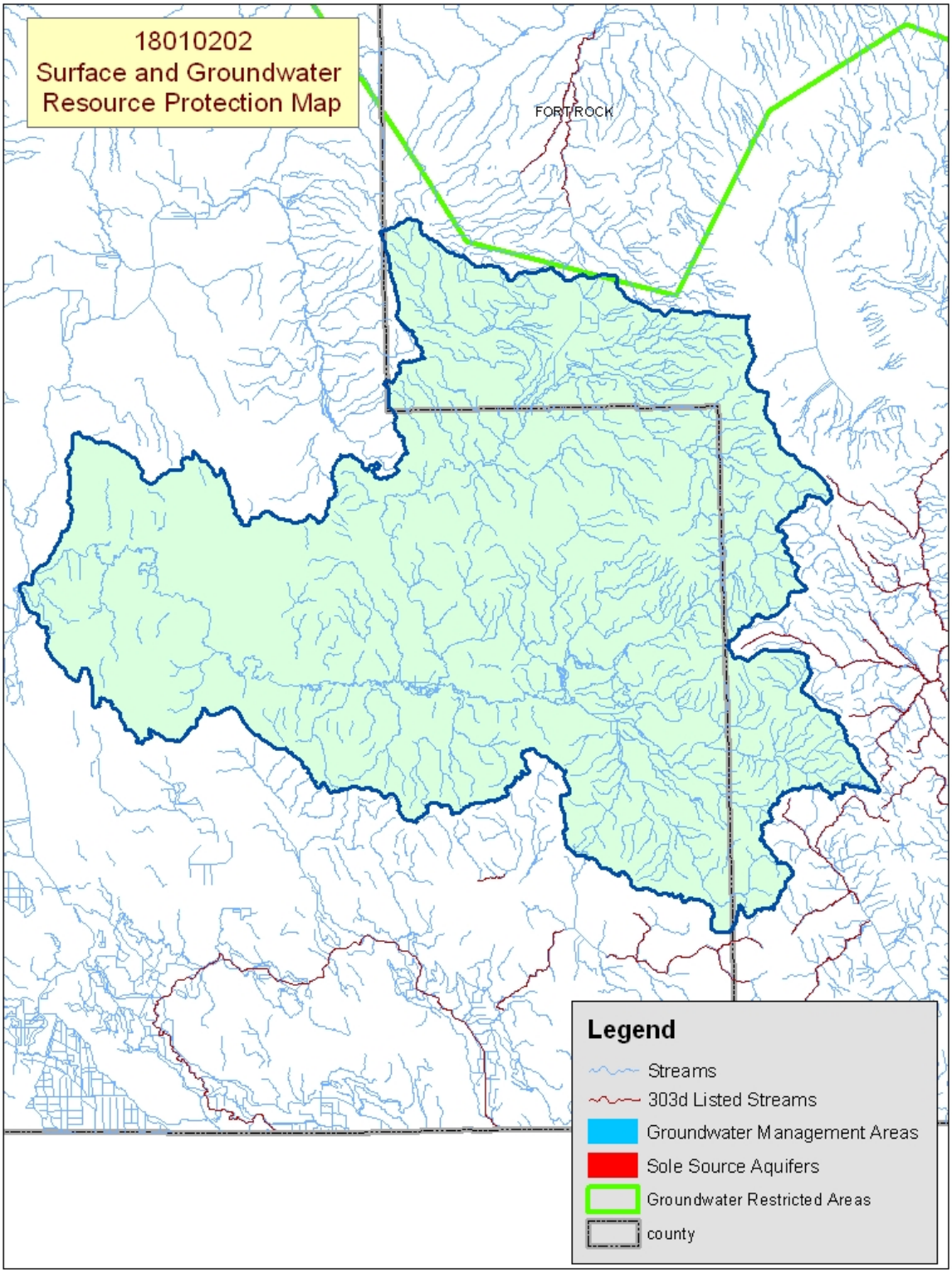


Map Footnote [17]

Resource Concerns - Continued

Back to Contents

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)**	**Shrub / Range**	**Forest**
Soil Erosion	Concentrated Flow or Gully					X	X
	Streambank	X				X	X
Soil Condition	Soil Compaction	X					X
Water Quantity	Water Mgt. For Irrigated Land	X					
	Water Mgt. For Non-Irrigated Land					X	X
Water Quality, Surface	Nutrients & Organics	X					
	Suspended Sediments & Turbidity	X				X	
	Low Dissolved Oxygen	X					
	Temperature	X				X	
	Aquatic Habitat Suitability	X				X	X
Plant Suitability	To Site & Intended Use					X	X
Plant Condition	Productivity, Health & Vigor	X				X	X
	Noxious and Invasive Weeds	X				X	
Plant Management	Establishment, Growth, & Harvest					X	X
Human Economics	Low or Unreliable Profitability	X				X	
Human, Political	Inadequate availability of Cost Share Programs	X				X	X
	High Degree of Controversy	X				X	X

Grass / Pasture / Hay Lands

- While some irrigated pasture is well managed, many units are large units with only boundary fences and wild flood irrigation making it difficult to practice intensive grazing or irrigation water management.
- While many riparian buffers or riparian pastures have established along area streams, many units still permit unrestricted grazing of riparian areas resulting in bank erosion thereby contributing to poor water quality.
- Fields used to produce hay usually are better managed resulting in fewer resource concerns.

Range & Forest

- Most range and forest units, used for livestock grazing, are large making it difficult to implement intense grazing rotations with available fences and watering facilities.
- Juniper encroachment along with other noxious and invasive weeds reduces the health and vigor of range grasses and forbs.
- Dense juniper can result in higher evapo-transpiration rates reducing water availability for range vegetation and downstream subsurface discharge to the river.
- Similar hydrologic effects can be attributed to overstock stands of lodgepole and Ponderosa pine that increase canopy interception loses as well as from evapo-transpiration.

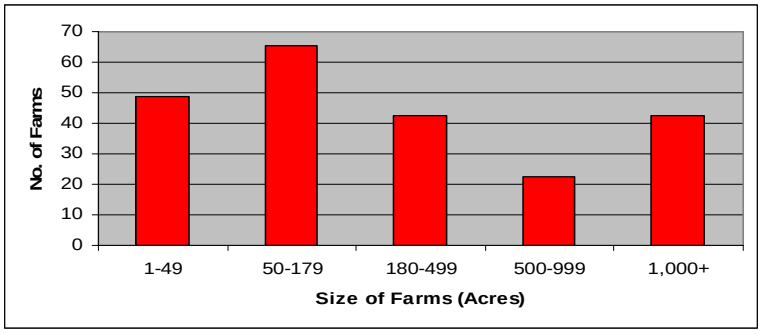
General

- Low profits from ranching, controversy over water use and water rights, endangered species concerns, and Tribal issues creates an atmosphere that in the past has discouraged landowner involvement in conservation activities. This is rapidly changing due to the efforts of agencies, organizations, Tribes and landowners, themselves, to reach out to find collaborative, workable solutions.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES[12]	
THREATENED SPECIES	**CANDIDATE SPECIES**
Mammals - Canada lynx **Birds –** Bald eagle, Northern spotted owl **Fish –** Shortnose sucker, Lost River sucker, Warner sucker, Bull trout, Hutton Springs tui chub, Foskett speckled dace **Plants –** Applegate's milk vetch	**Mammals -** Pacific fisher **Birds –** Yellow-billed cuckoo **Amphibians and Reptiles –** Columbia spotted frog, Oregon Spotted frog **Invertebrates -** Mardon skipper butterfly
	PROPOSED SPECIES None
ESSENTIAL FISH HABITAT[13] - None	

Census and Social Data[/14]

Back to Contents



Number of Farms: 221

Number of Operators: 365

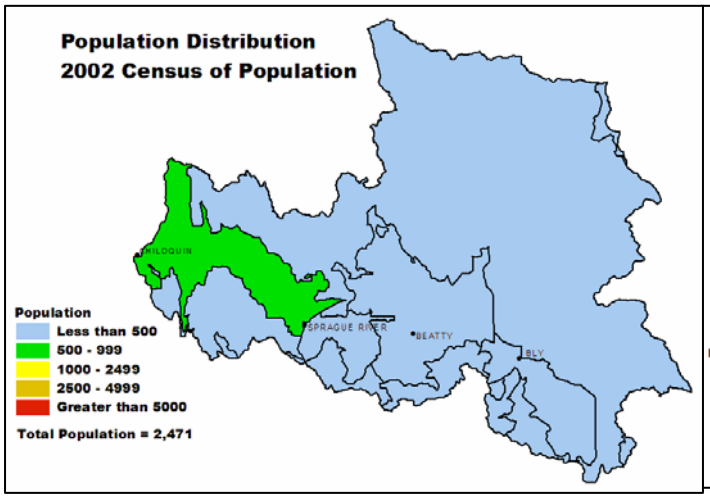
- Full-Time Operators: **127**
- Part-Time Operators: **239**

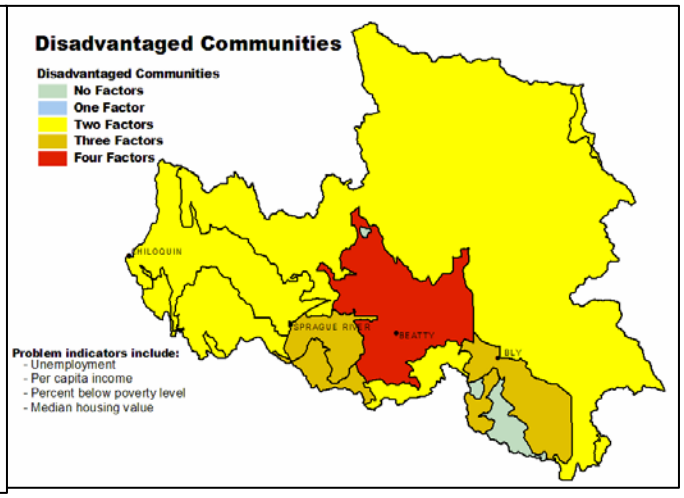
Estimated Level of Willingness and Ability to Participate in Conservation[/15]: HIGH

Farmers and ranchers in the Sprague subbasin tend to have the ability and willingness to adopt conservation and resource management systems (RMSs). Most are experienced, educated, successful landowners, who run financially viable operations. However, only recently have resources been available to aggressively encourage the adoption of conservation RMSs. Conservation information, marketing, and technical and financial assistance, targeted at Sprague landowners, will increase the adoption of conservation in the Sprague subbasin.

Evaluation of Social Capital[/16]: MODERATE

Social capital, and the community's involvement in promoting conservation among agricultural landowners in the Sprague subbasin, has been reasonable but not substantial. Until recently other social, economic, and political issues have consumed most of the community's interest and energy. However, as of late, agricultural landowners and other community stakeholders are starting to work together and actively engage in concerted activities supporting local conservation. As community-wide interest in local resource concerns increases and local leadership becomes involved, the diffusion of conservation in the subbasin is expected to increase.

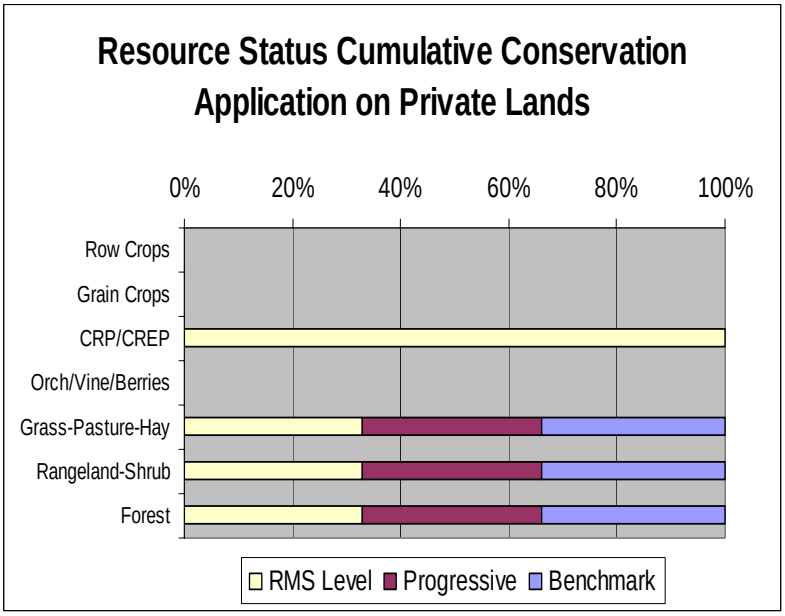




Progress / Status

Back to Contents

PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg / Year	Total
Total Conservation Systems Planned (Acres)	7,762	1,526	1,110	4,803	2,961	3,632	18,162
Total Conservation Systems Applied (Acres)	2,490	1,491	344	276	200	960	4,801
Conservation Treatment Acres							
Waste Management	0	0	0	0	0	0	0
Buffers	0	0	0	0	226	45	226
Erosion Control	0	0	0	0	0	0	0
Irrigation Water Management	227	188	432	0	903	350	1,750
Nutrient Management	0	0	0	0	298	60	298
Pest Management	0	0	0	0	298	60	298
Prescribed Grazing	4,229	1,495	2,818	4,803	1,877	3,044	15,222
Trees & Shrubs	0	0	0	0	0	0	0
Conservation Tillage	0	0	0	0	0	0	0
Wildlife Habitat	6,551	1,652	2,602	575	0	2,276	11,380
Wetlands	782	0	344	1,418	0	509	2,544



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

- Progress over the last five years has been focused on:
  - Prescribed grazing and irrigation water management on irrigated pasture.
  - Wildlife habitat management on riparian and wetland areas.
- Often pasture is not intensively farmed lacking adequate water and grazing management. A majority of ranches are operated by absentee landowners or lessees.
- Juniper encroachment and invasive weeds have reduced the productivity of many range units.
- Most private, industrial forest land meets state forest practice requirements.
- High cost and unreliable markets, limit forest management activities on private, non-industrial forest lands. A high percentage of these forestlands are overstocked with stagnate stands that reduce productivity for livestock grazing, wildlife or timber production.

Lands Removed from Production through Farm Bill Programs

- Conservation Reserve Program (CRP): **120 acres**
- Wetland Restoration Program (WRP): **4,314 acres**
- Conservation Reserve Enhancement Program (CREP): **1,159 acres**

Footnotes/Bibliography

Back to Contents

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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

Back to Contents

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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.