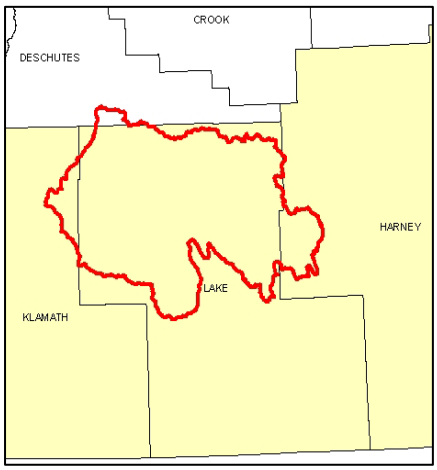
Summer Lake – 17120005

8-Digit Hydrologic Unit Profile

FINAL

SWCD	Acres	SWCD	Acres
Fort Rock / Silver Lake	2,254,885	Klamath	111,562
		Deschutes	36,656
Harney	181,760	Lakeview	39,017



Introduction

The Summer Lake 8-Digit Hydrologic Unit Code (HUC) subbasin is comprised of 2.6 million acres, mostly in Lake County. Sixty percent of the subbasin is shrubland and rangeland, twenty percent is forestland, and about ten percent is grassland, hayland, and pastureland. There are three permitted feedlots and 16,000 permitted animals in the subbasin. Resource concerns include wind and streambank erosion, declining rangeland condition due to past grazing practices, poor or limited irrigation water management in areas used for pasture and grain, and diminishing wildlife habitat. Treating these concerns is difficult because of land use constraints, such as high soil salinity, and unstable economic conditions throughout the subbasin.

There are 167 farms and 278 operators in the subbasin. Many of the farms and ranches are only marginally profitable. Most of the farmers and ranchers are aware of local resource concerns and appreciate the effect conservation has on these concerns; however, conservation is not widely perceived to be economically feasible, timely technical assistance is not readily available, and the community is not an effective force behind resource management.

The NRCS Lakeview Service Center, Ft. Rock–Silver Lake Soil and Water Conservation District, and Silver Lake Watershed Council provide conservation assistance in the subbasin.

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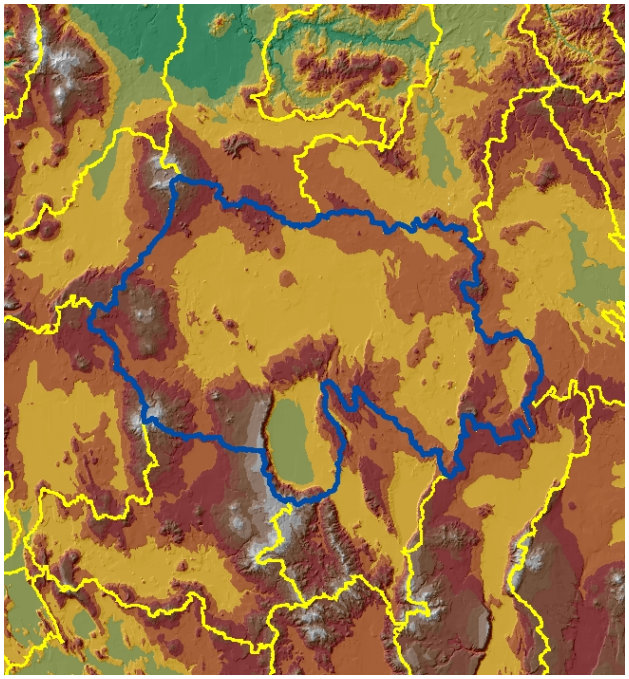

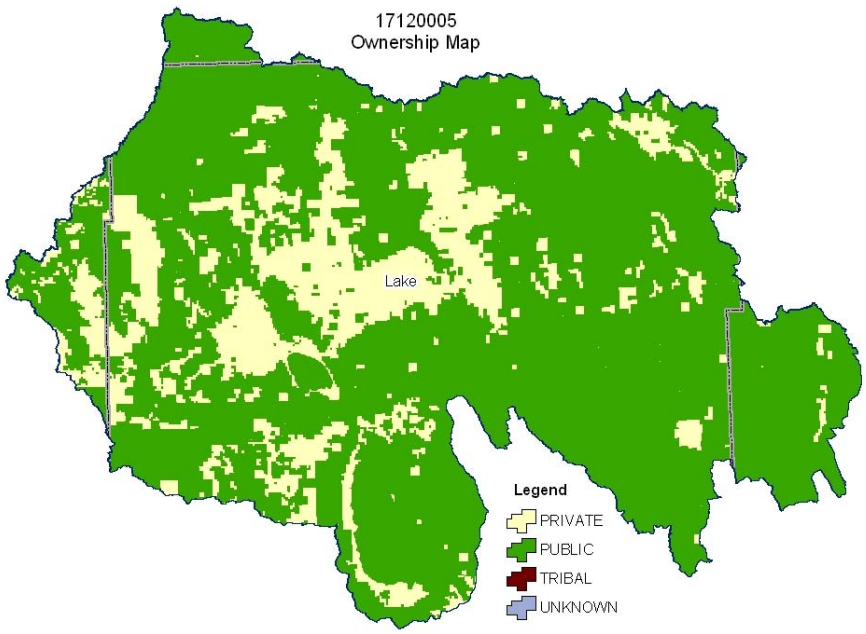

Produced by the Water Resources Planning Team Portland, OR

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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	417,500	16%	116,300	4%	0	0%	533,800	20%
Grain Crops	*	---	14,200	1%	0	0%	14,900	1%
Conservation Reserve Program Land [a]	*	---	*	---	0	0%	*	---
Grass/Pasture/Hay	146,100	6%	88,800	3%	0	0%	234,900	9%
Orchards/Vineyards	0	0%	0	0%	0	0%	0	0%
Row Crops	*	---	*	---	0	0%	*	---
Shrub/Rangelands	1,332,400	51%	251,800	10%	0	0%	1,584,200	60%
Water/Wetlands/Developed/Barren	195,400	7%	56,600	2%	0	0%	252,000	10%
Oregon HUC Totals [b]	**2,092,100**	**80%**	**531,200**	**20%**	**0**	**0%**	**2,623,300**	**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:

- Much of the grain acreage has been converted to alfalfa hay. The remaining grain is grown as hay.
- In the past, attempts have been made to grow some row crops, such as root stock for strawberries, seed potatoes, and peppermint, but the soils generally are too high in salinity.

Irrigated Lands (1997 NRI[13] Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	0	0%	0%
	Uncultivated Cropland	42,500	59%	2%
	Pastureland	29,300	41%	1%
	Total Irrigated Lands	**71,800**	**100%**	**3%**

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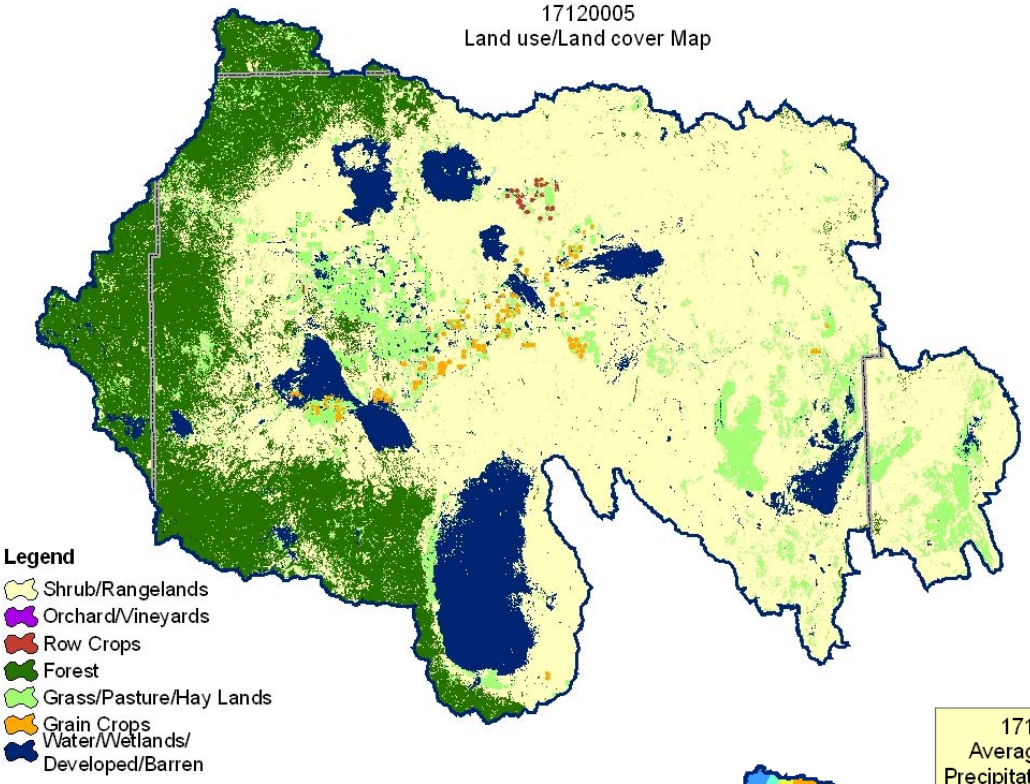

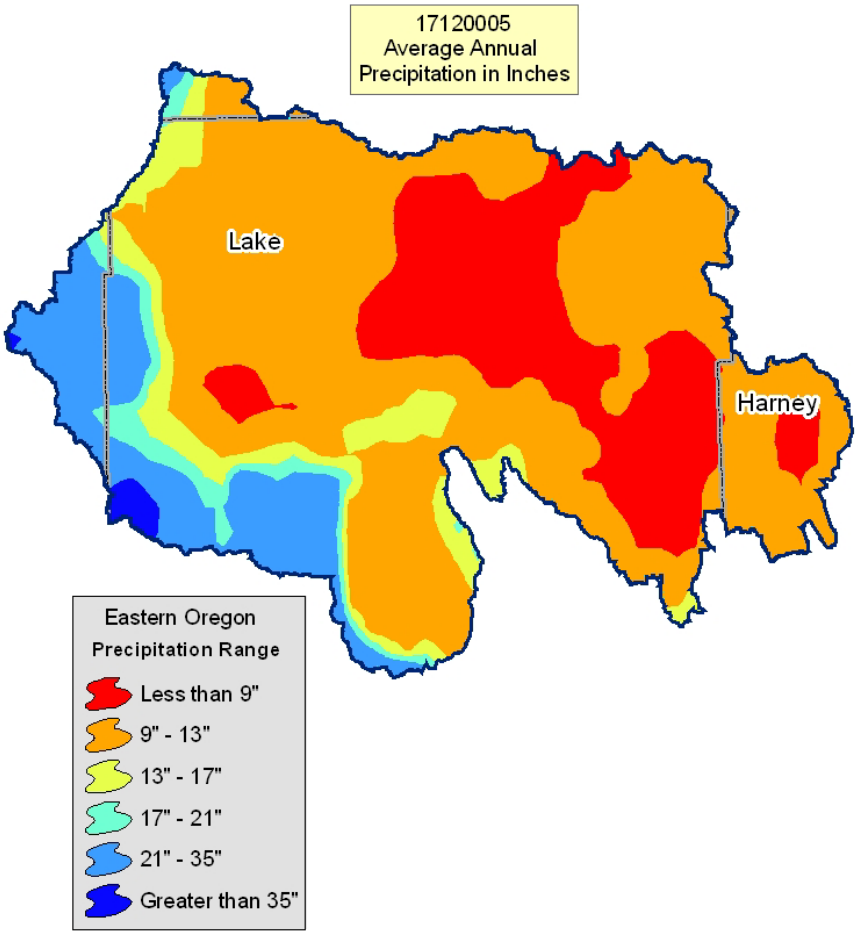

Common Resource Area Map

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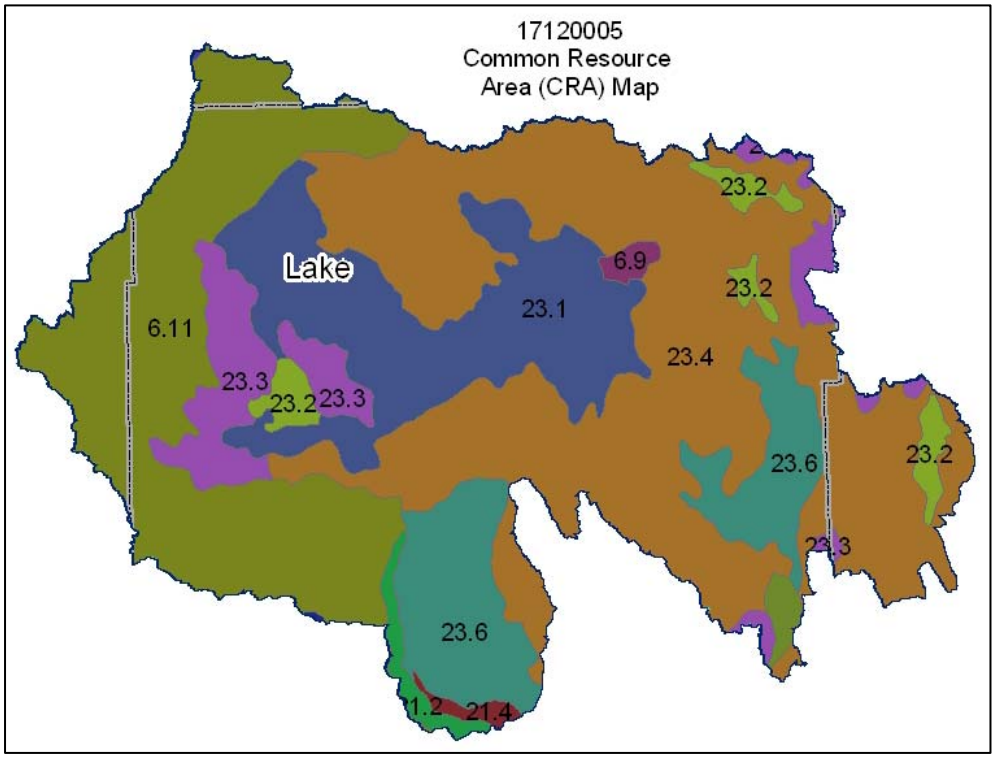
Only the major units are described below - for descriptions of all units within the HUC, go to: http://ice.or.nrcs.usda.gov/website/cra/viewer.htm



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. The vegetation is dominantly 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. The temperature regime is cryic, and the moisture regime is xeric.

23.1 – Malheur High Plateau - Ashy Pluvial Lake Basins: This unit is characterized by cold basins that contain significant amounts of volcanic ash, including Millican Valley and Fort Rock Basin. The temperature regime is frigid, and the moisture regime is aridic. The dominant soils are those of the Fort Rock, Bonnick, Abert, Gardone, and Borobey series. Most of the soils are well drained. Few wetlands are present.

23.4 – Malheur High Plateau - High Lava Plains: This unit is on basalt plateaus and the escarpments of fault block mountains. The soil temperature regime is frigid or mesic, and the moisture regime is primarily aridic. The soils are typically shallow or moderately deep to bedrock or a cemented pan, and they have a strongly developed argillic horizon. The vegetation is dominantly low sagebrush, Wyoming big sagebrush, Idaho fescue, Thurber needlegrass, and bluebunch wheatgrass. Playas, small intermittent lakes, and clay that has a high shrink-swell potential are common in depressions.

23.6 – Malheur High Plateau - Warm High Desert Basins: This unit is characterized by basins that contain significant amounts of volcanic ash. The temperature regime is dominantly mesic, and the moisture regime is aridic. The soils typically are very deep and are well drained to very poorly drained. Wetland areas, shallow lakes, and playas are locally common.

Physical Description – Continued

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		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	13,213	39,488
	Well	65,769	196,189
	Total Irrigated Adjudicated Water Rights	78,982	235,678
Stream Flow Data	USGS 10388001 ANA RIVER PLUS SUMMER LK CA, NR SUMMER LK, OR	**Total Avg. Yield**	65,092
		May – Sept. Yield	25,906
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	331	---
	303d/TMDL Listed Streams (DEQ)	25	8%
	Anadromous Fish Presence (StreamNet)	0	0%
	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	14,728	22%
	Grain Crops	208	0%
	Grass/Pasture/Hay	4,778	7%
	Orchards/Vineyards	0	0%
	Row Crops	39	0%
	Shrub/Rangelands – Includes CRP Lands	40,683	61%
	Water/Wetlands/Developed/Barren	6,397	10%
	Total Acres of 100-foot Stream Buffers	**66,833**	**---**
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	1,500	11%
	3 – severe limitations	6,100	45%
	4 – very severe limitations	0	0%
	5 – no erosion hazard, but other limitations	1,700	13%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	4,300	32%
	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	**13,600**	**---**

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

Animal Type	Dairy	Feedlot	Poultry	Swine	Mink	Other
No. of Permitted Farms	0	3	0	0	0	0
No. of Permitted Animals	0	15,950	0	0	0	0

Resource Concerns

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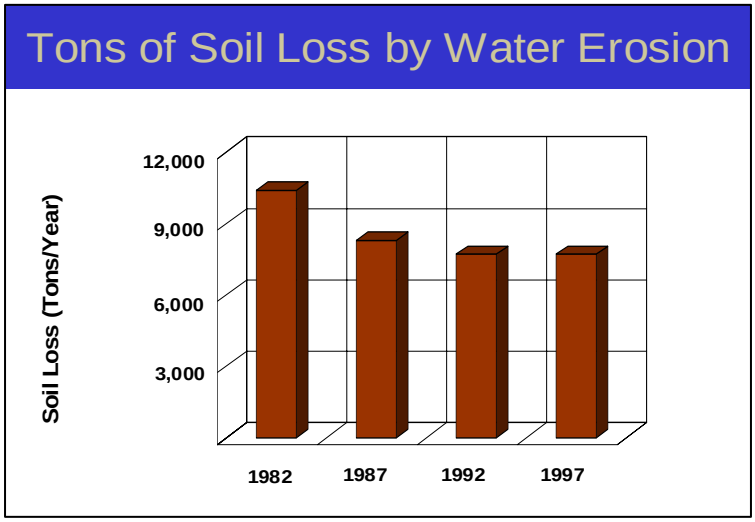
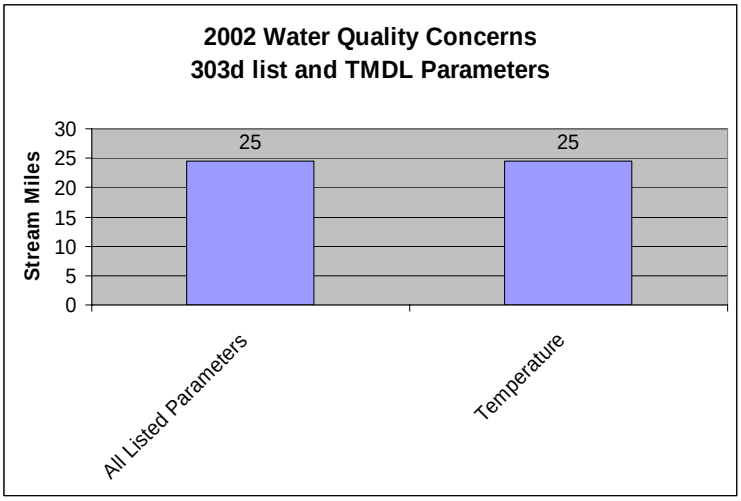


- Sheet and rill erosion by water on the cropland and pastureland have been reduced nearly 3,000 tons of soil per year from 1982 to 1997.
- NRI estimates indicate that none of the agricultural lands still had water erosion rates above a sustainable level in 1997.
- Controlling erosion not only sustains the long-term productivity of the land, but it also affects the amount of soil, pesticides, fertilizer, and other substances that move into the Nation's waters.



- All listed stream miles exceed State water quality standards for temperature. Elevated stream temperatures may be due to inadequate riparian shade, stream channel widening, warm irrigation return flows, and other anthropogenic or natural causes.
- Conservation practices that can be used to address these water quality issues include grazing management, irrigation water 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	None	None
ODEQ TMDL's[8]		ODA Agricultural Water Quality Management Plans[9]	
Name	Status	Name	Status
None	None	Goose & Summer Lakes	Completed
OWEB Watershed Council[10]	Watershed Council Assessments[11]	NWPCC Subbasin Plans and Assessments[18]	
Silver Lake Watershed Council	None	None	

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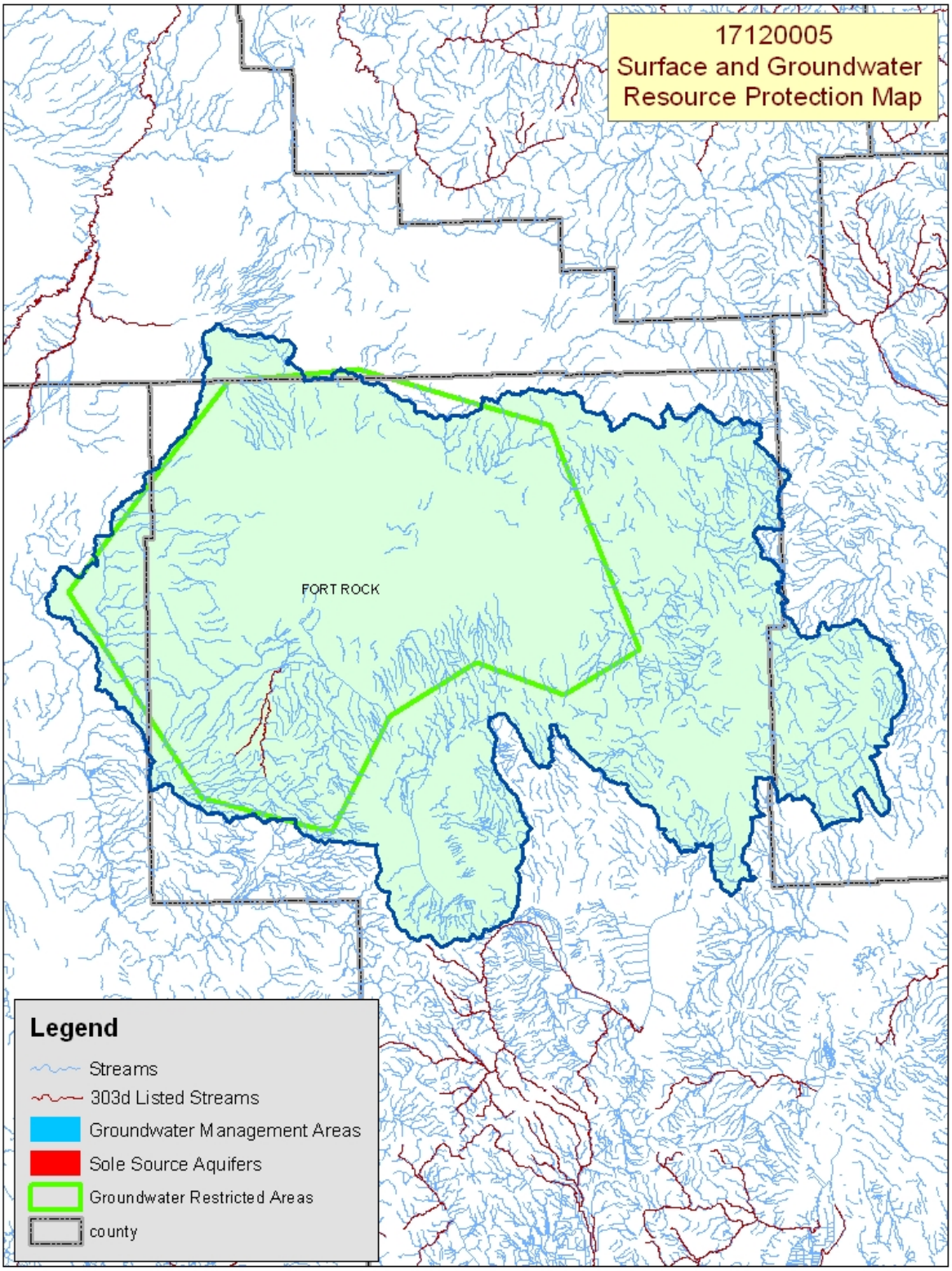

Map Footnote [17]

Resource Concerns - Continued

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Resource Concerns / Issues by Land Use							
SWAPA +H Concerns	**Specific Resource Concern / Issue**	**Grass \ Pasture**	**Grain Crops**	**Row Crops**	**Hay**	**Shrub / Range**	**Forest**
Soil Erosion	Wind		X		X		
	Streambank	X				X	X
Soil Condition	Soil Compaction	X					
Water Quantity	Water Management for Irrigated Land	X	X		X		
Water Quality, Surface	Temperature	X				X	X
Air Quality	Airborne Sediment Causing Safety/Health Problems		X		X		
Plant Suitability	Site and Intended Use Suitability					X	X
Plant Condition	Productivity, Health, and Vigor	X	X		X		
Animal Habitat, Domestic	Water - Quantity and Quality					X	
Animal Habitat, Wildlife	Water - Quantity and Quality					X	
Human, Economics	Land Use Constraints/Restrictions	X			X	X	
	High Risk & Uncertainty		X		X		
	Low or Unreliable Profitability	X	X		X	X	X
Human, Political	Inadequate Availability of Cost Share Programs	X			X	X	X

Grass / Pasture / Hay

- Most ranches have areas of irrigated hay and pasture.
- Generally, a higher level of irrigation water management is used on hayland than on pastureland.
- Wind erosion can be a resource concern on sandy soils where the forage stand has not been properly managed for cover or to maximize production.
- Low economic return limits adoption of appropriate conservation practices.

Grain Crops

- Wind erosion and irrigation water management are the primary resource concerns.
- High costs to update irrigation systems compared to potential profits commonly hinder implementation of additional conservation practices.

Shrub / Rangeland

- Some areas of rangeland are dominantly annual grasses and shrubs because of past grazing practices.
- Loss of riparian vegetation contributes to stream warming.
- Low profit limits conservation adoption.

Forestland

- Lack of thinning and forest management can result in stagnate stands that have low value for commercial wood products, livestock grazing, or wildlife habitat.
- Low profit, unreliable markets, and inadequate incentive programs limit forest management activities on private, non-industrial forestland.

General

- The high salinity and content of minerals in the soils limit or restrict many uses.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES[12]	
THREATENED SPECIES	**CANDIDATE SPECIES**
Mammals- Canada lynx **Birds –** Bald eagle **Fish –** Borax Lake chub, Lahontan cutthroat trout, Bull trout **Plants –** Malheur wire-lettuce	**Birds –** Yellow-billed cuckoo **Amphibians and Reptiles –** Columbia spotted frog **PROPOSED SPECIES** None
ESSENTIAL FISH HABITAT[13] - None	

Census and Social Data[/14]

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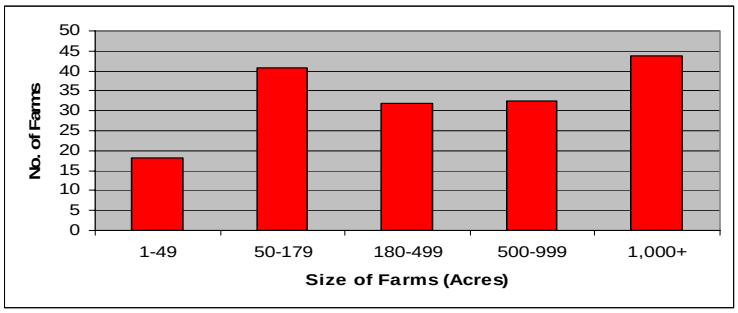


Number of Farms: 167

Number of Operators: 278

- Full-Time Operators: **111**
- Part-Time Operators: **167**

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

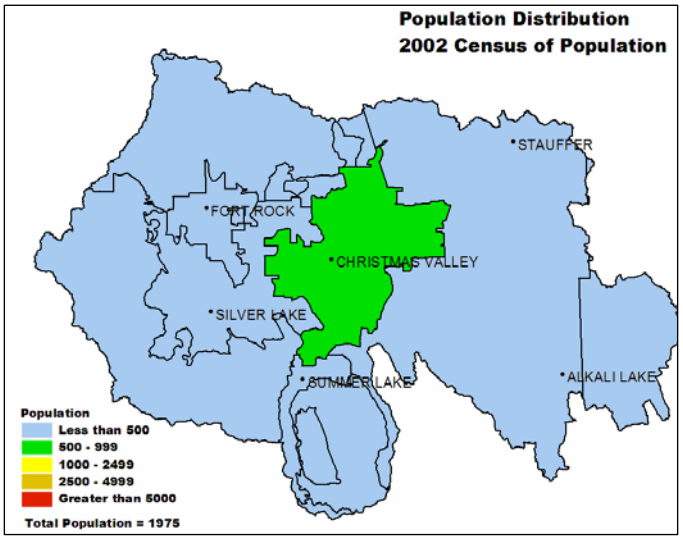
Farmers and ranchers in the Summer Lake subbasin reportedly are aware of local resource concerns and the importance of their resource management system in addressing these concerns. Most operators are well educated, maintain a positive stewardship attitude, and have already adopted some conservation practices. The operators, however, perceive conservation to be only moderately agriculturally and economically feasible. Agriculture in the subbasin reportedly is only moderately profitable; therefore, it is unlikely the operators will adopt agricultural innovations, including conservation. Timely technical assistance is not readily available throughout most of the subbasin.

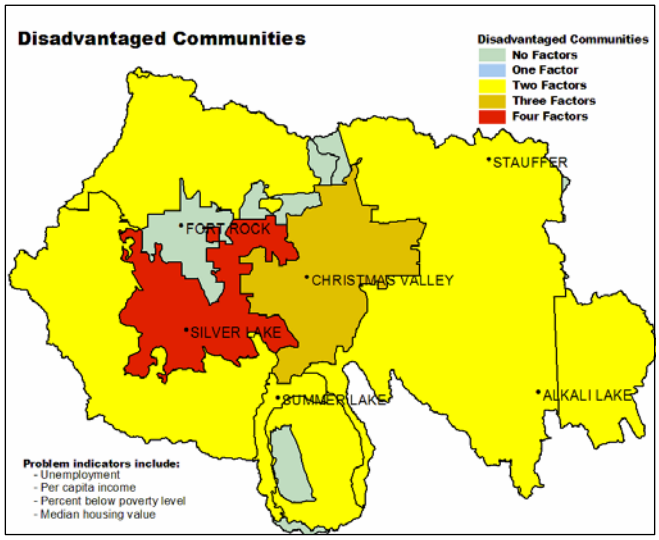
Conservation marketing targeted at meeting the particular needs of the Summer Lake operators and alleviating their concerns could increase the adoption of conservation practices. Also, offering expedient technical and financial assistance could help accelerate the diffusion of conservation throughout the subbasin.

Evaluation of Social Capital[/16]: Low

Social capital and involvement of the community in promoting conservation among agricultural landowners in the Summer Lake subbasin reportedly is low. Effective local leadership and community participation is not consistent. Possibly because of the geographic remoteness of the subbasin, communication among neighbors within the community and with sources of information outside the region is weak. Nevertheless, when an issue arises that the people of Summer Lake deem important, volunteers step forward.

Community development assistance and conservation marketing could help the community gain an appreciation for conservation and possibly become a significant force behind the diffusion of conservation among the farmers and ranchers in Summer Lake subbasin.





Progress / Status

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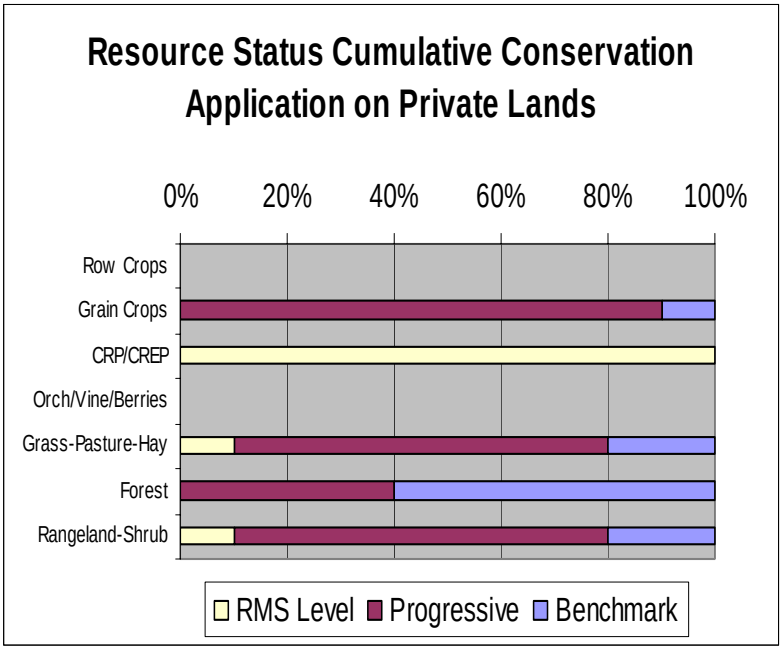
PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg / Year	Total
Total Conservation Systems Planned (Acres)	350	1,500	6,636	0	3,654	2,428	12,140
Total Conservation Systems Applied (Acres)	190	300	0	1,200	0	338	1,690
Conservation Treatment (Acres)							
Waste Management	0	0	0	0	0	0	0
Buffers	0	0	35	0	0	7	35
Erosion Control	190	425	0	0	0	123	615
Irrigation Water Management	0	0	0	0	0	0	0
Nutrient Management	0	0	0	0	0	0	0
Pest Management	0	0	0	0	0	0	0
Prescribed Grazing	0	2,605	2,430	1,200	0	1,247	6,235
Trees and Shrubs	0	0	0	36	0	7	36
Conservation Tillage	0	0	0	0	0	0	0
Wildlife Habitat	0	168	0	1,200	4,860	1,246	6,228
Wetlands	0	0	0	0	0	0	0



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

- Progress over the last 5 years has been focused on:
  - Prescribed grazing on irrigated pastureland
  - Erosion control
  - Wildlife habitat
- A high level of conservation management is being applied in most areas of irrigated alfalfa and pasture.
- Commonly the rangeland is not intensively farmed because of a lack of adequate water and grazing management. A majority of the ranches are operated by absentee landowners or lessees.
- Most private, industrial forestland meets State forest practice act requirements.
- High cost and unreliable markets limit forest management activities on private, non-industrial forestland.

Lands Removed from Production through Farm Bill Programs

- Conservation Reserve Program (CRP): **846 acres**
- 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.