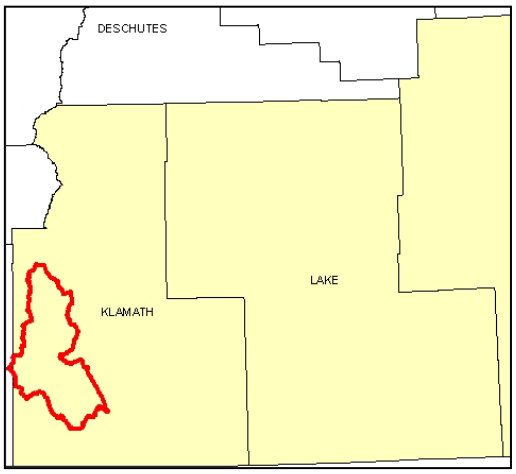
Upper Klamath Lake – 18010203

8-Digit Hydrologic Unit Profile

FINAL

SEPTEMBER 2005



Introduction

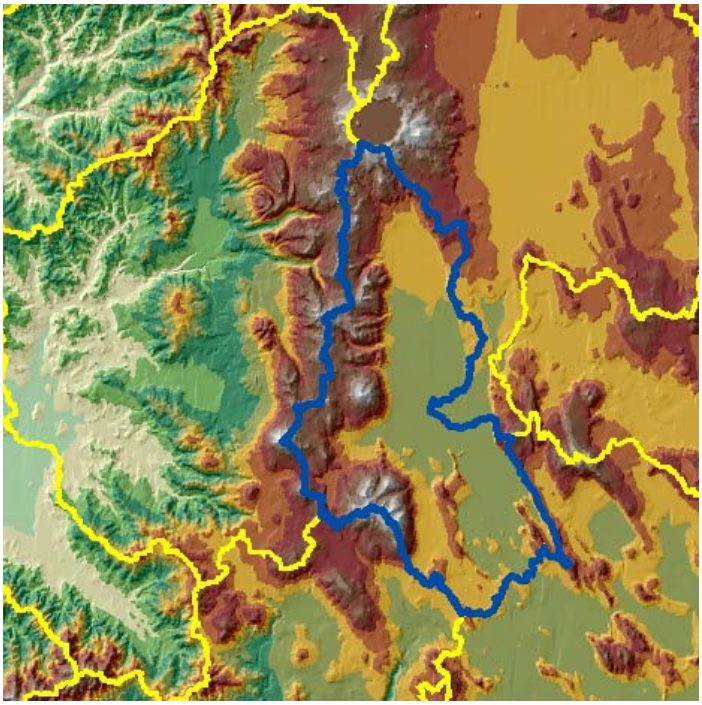
Thirty-three percent of the Upper Klamath Lake 8-Digit Hydrologic Unit Code (HUC) is under private ownership. Water and wetlands cover about twenty–five percent of the subbasin. Agricultural lands are used for irrigated hay and pasture. The main resource concerns are water quality and quantity, fish and wildlife habitat, noxious weeds, and streambank erosion. Also, farmers are being pressured to convert agricultural lands to wetlands and there is urban encroachment on farmland.

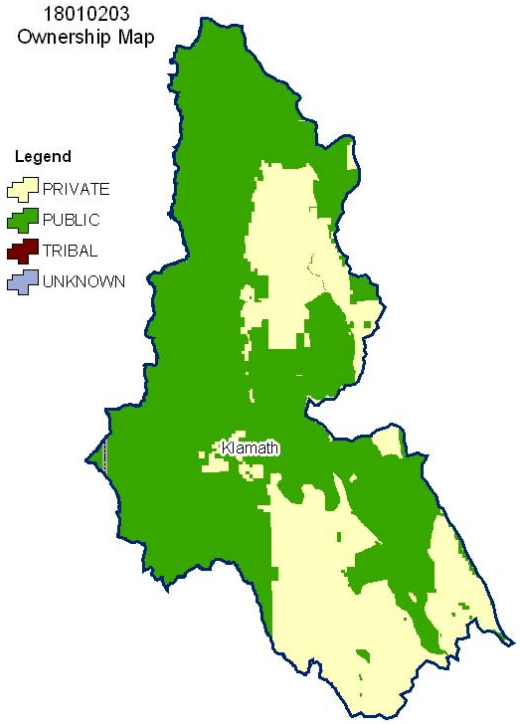
There are 125 farms in the Upper Klamath Lake subbasin. One-half of the farms are less than 50 acres in size, and the operators tend to be people new to agriculture and resource management who moved to the area for a rural lifestyle.

NRCS conservation assistance in the Upper Klamath Lake subbasin is provided through the Klamath Falls Service Center. The Klamath Soil and Water Conservation District, Klamath County Watershed Council and working group, and other local agencies and organizations also provide various forms of conservation assistance.

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	206,400	45%	69,700	15%	0	0%	**276,100**	**60%**
Grain Crops	*	---	*	---	0	0%	*	---
Conservation Reserve Program Land [a]	0	0%	0	0%	0	0%	**0**	**0%**
Grass/Pasture/Hay	12,100	3%	45,500	10%	0	0%	**57,600**	**12%**
Orchards/Vineyards	0	0%	0	0%	0	0%	**0**	**0%**
Row Crops	*	---	*	---	0	0%	*	---
Shrub/Rangelands	*	---	*	---	0	0%	**10,700**	**2%**
Water/Wetlands/Developed/Barren	87,900	19%	21,700	5%	0	0%	**109,600**	**24%**
Oregon HUC Totals *b*	**310,600**	**67%**	**151,700**	**33%**	**0**	**0%**	**462,300**	**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.

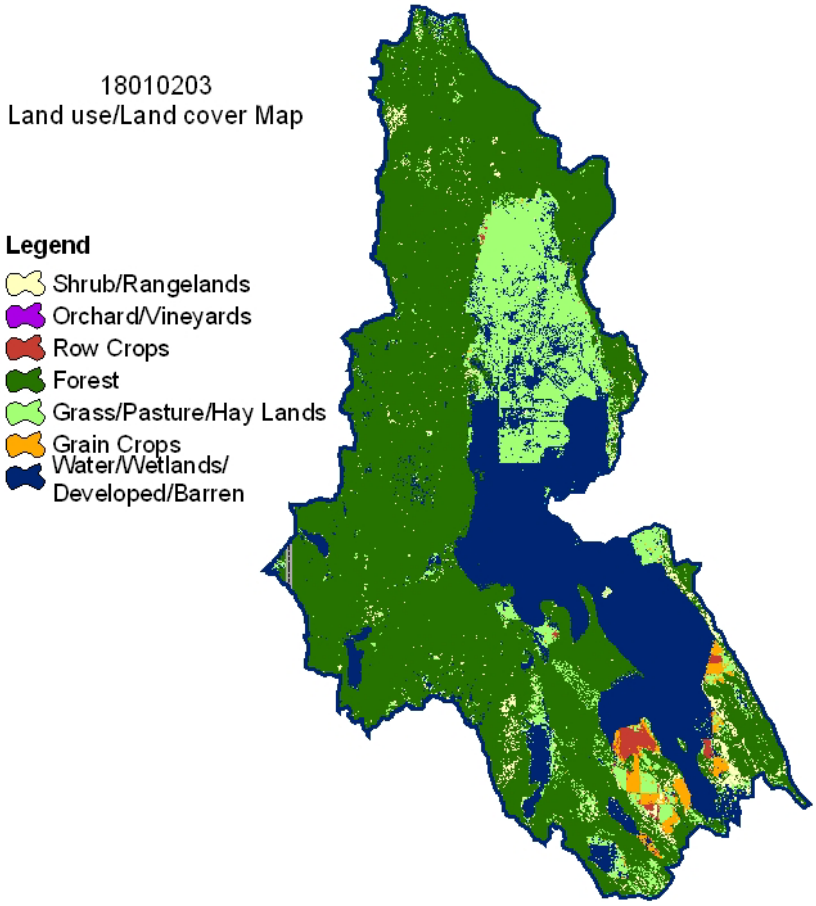
Special Considerations for This 8-Digit HUC:

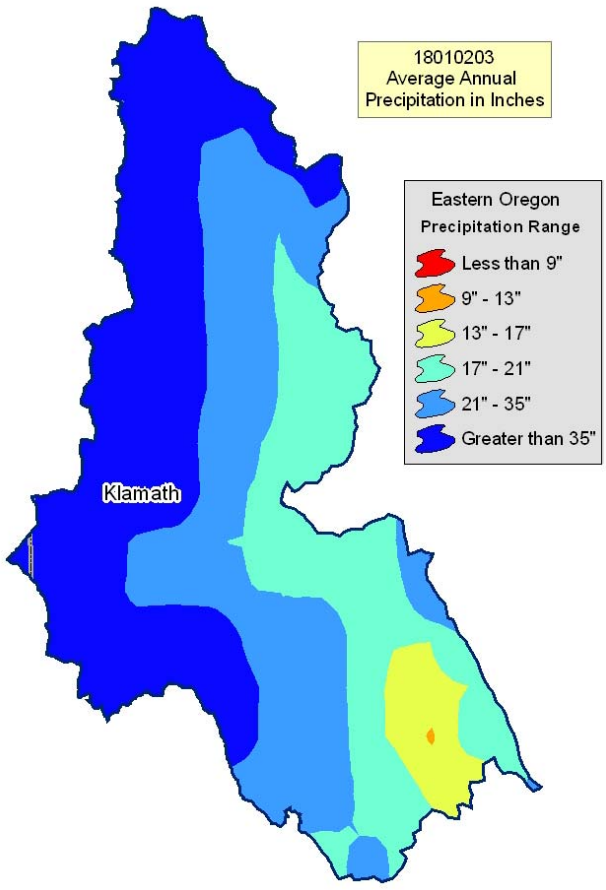
- Approximately 30,000 acres of the private forestland is under industrial forest ownership (NRCS, Upper Klamath Basin Rapid Subbasin Assessments, 2003).
- Much of the 39,700 acres of private non-industrial forestland is used for rural residences and not managed for timber production.
- Approximately 52,300 acres is irrigated and used mainly for pasture and grass hay (NRCS, Upper Klamath Basin Rapid Subbasin Assessments, 2003).
- Rangeland and shrubland vegetation is on the steep eastern ridge of the watershed, along Upper Klamath Lake. This area, for the most part, is not used for livestock grazing.
- In the past, potatoes occasionally were grown on reclaimed wetlands around Upper Klamath Lake. Most of the land suitable for potatoes is now being restored to wetlands.

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	8,200	19%	2%
	Pastureland	34,200	81%	7%
	Total Irrigated Lands	**42,400**	**100%**	**9%**

(Continued on the following pages)

18010203
Land use/Land cover Map





Common Resource Area Map

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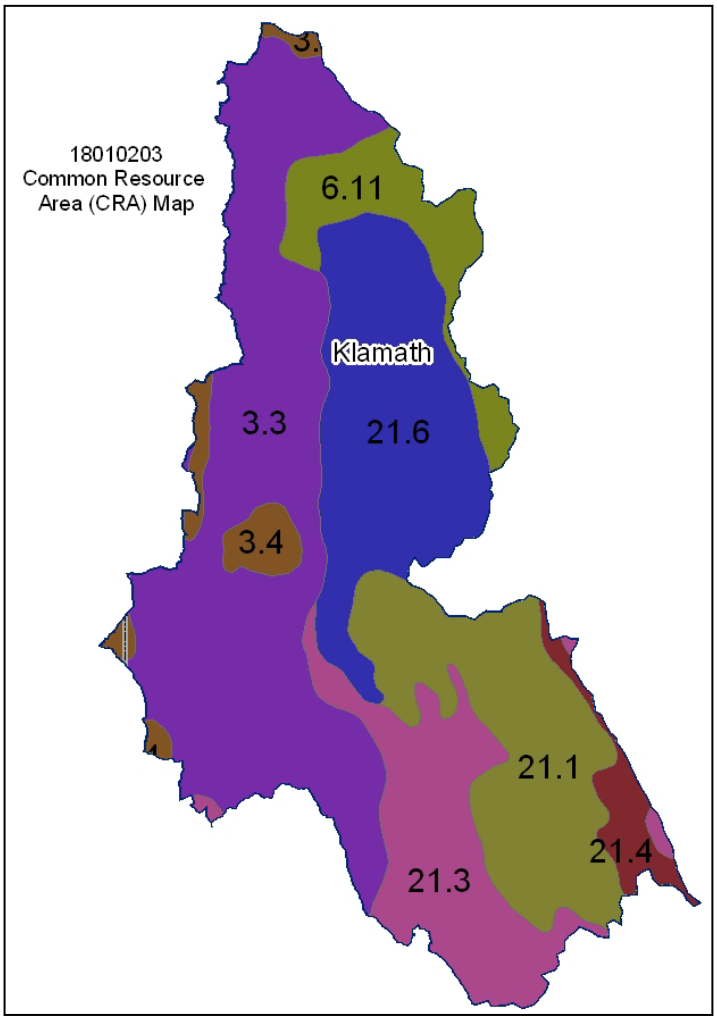
Only the major units are described below - for descriptions of all units within the HUC, go to: http://ice.or.nrcs.usda.gov/website/cra/viewer.htm



3.3 – Olympic and Cascade Mountains - Southern Cascade Crest Montane Forest: This unit comprises the southern end of the high Cascades. Vegetation is mountain hemlock, lodgepole pine, Shasta red fir, Pacific silver fir, and noble fir. The unit has plateau topography and is characterized by numerous alpine lakes. The temperature regime is cryic, and the moisture regime is udic.

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 that support 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.

21.1 – Klamath and Shasta Valleys and Basins - Klamath-Goose Lake Warm Wet Basins: This unit is characterized by flood plains and terraces in the warm basins. The temperature regime is mesic, and the moisture regime is xeric. This unit is in Goose Lake and Klamath Basins. Most areas are cropped, and supplemental irrigation may be needed. The dominant soils are those of the Goose Lake, Lakeview, Malin, Tulana, Drews, Deter, and Fordney series.

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. The temperature regime is frigid, and the moisture regime is xeric. The dominant soils are those of the Pinehurst, Greystoke, Woodcock, and Royst series. The vegetation is dominantly ponderosa pine, Douglas fir, and some Shasta red fir. The major separation of unit 21.2 from 21.3 is Bly Mountain. White fir is dominant on unit 21.2, and Douglas fir is dominant on unit 21.3.

21.6 – Klamath and Shasta Valleys and Basins - Cold Flood Plains and Basins: This unit is characterized by flood plains and terraces in cold basins. The temperature regime is cryic and frigid, and the moisture regime is xeric. This unit is in the Sprague River Valley. Because of the cold temperatures, most areas are used as pastureland or hayland. The dominant soils are those of the Lather, Klamath, Ontko, Kirk, and Chock series.

Physical Description – Continued

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		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	77,904	288,387
	Well	2,348	6,995
	Total Irrigated Adjudicated Water Rights	80,253	295,382
Stream Flow Data	USGS 11504000 WOOD RIVER, AT FORT KLAMATH, OR	**Total Avg. Yield**	155,502
		May – Sept. Yield	59,635
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	518	---
	303d/TMDL Listed Streams (DEQ)	38	7%
	Anadromous Fish Presence (StreamNet)	0	0%
	Bull Trout Presence (StreamNet)	6	1%
		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	5,030	33%
	Grain Crops	445	3%
	Grass/Pasture/Hay	4,496	30%
	Orchards/Vineyards	0	0%
	Row Crops	232	2%
	Shrub/Rangelands – Includes CRP Lands	180	1%
	Water/Wetlands/Developed/Barren	4,722	31%
	Total Acres of 100-foot Stream Buffers	**15,105**	---
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	41,600	55%
	4 – very severe limitations	10,600	14%
	5 – no erosion hazard, but other limitations	22,100	29%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	1,300	2%
	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	**75,600**	---

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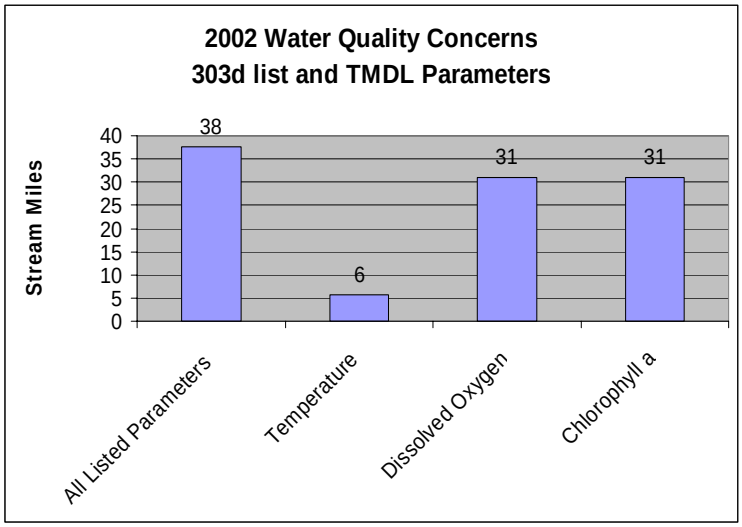
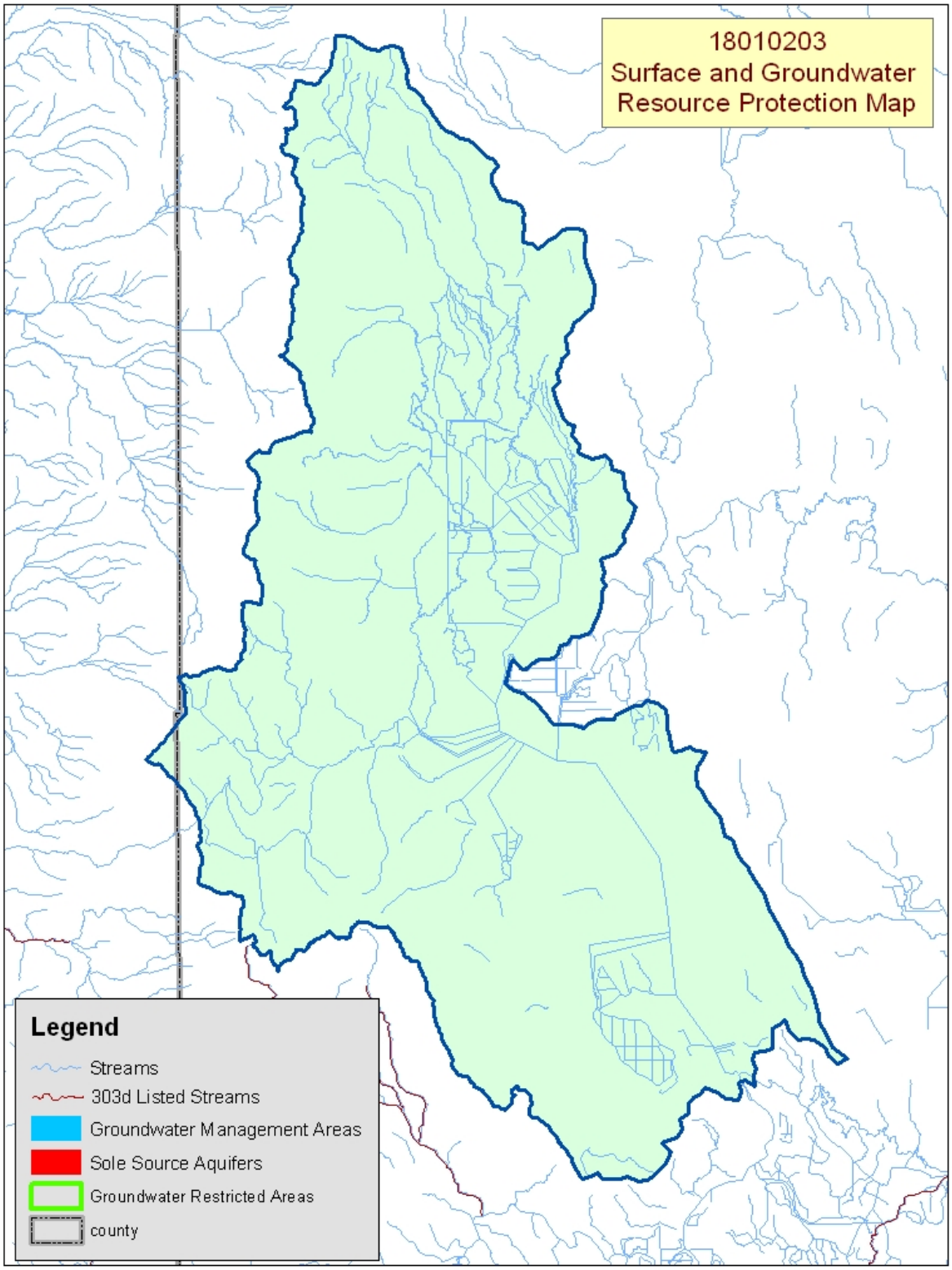
Tons of Soil Loss by Water Erosion: Due to the limited amount of non-Federal cropland and pastureland within this HUC, no reliable NRI soil loss estimates are available.



- Only 15 percent of the listed stream miles exceed State water quality standards for stream temperature.
- DO and Chlorophyll a 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, livestock waste management, 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		Upper Klamath Subbasin Assessments (Upper Klamath Lake)	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 and Assessments[18]		
Klamath Watershed Council/West Klamath Lake Watershed Working Group	None		None		

(Continued on page 8)



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**	**Alfalfa Hay**	**Grain Crops**	**Perennial Crops (Orch/Vine/ Berries)**	**Shrub/Range**	**Forest**
Soil Erosion	Wind			X			
	Streambank	X					
Soil Condition	Soil Compaction	X					
Water Quantity	Water Management For Irrigated Land	X	X	X			
Water Quality, Surface	Nutrients & Organics	X		X			
	Suspended Sediments & Turbidity	X					
	Temperature	X					
	Aquatic Habitat Suitability	X					
Plant Suitability	Site & Intended Use Suitability	X					X
Plant Condition	Productivity, Health, & Vigor	X					
Plant Management	Establishment, Growth, & Harvest	X					X
	Water - Quantity & Quality	X					
Human, Economics	Land Use Constraints/Restrictions			X			
	High Capital/Financial Costs	X	X	X			
	Low or Unreliable Profitability	X					
Human, Social	Low Client Well-Being						X
Human, Political	High Degree of Controversy	X	X	X			X

Grass / Pasture / Hay

- The dominant agricultural land use in the watershed is irrigated pasture.
- Almost all pasture is flood irrigated through contour ditches, which restricts adequate management of water.
- Many pasture units are overgrazed, and cattle have access to streams and open irrigation ditches.
- The high cost to improve irrigation and grazing management along with the low, unpredictable profits can hinder adoption of conservation practices.

Alfalfa Hay

- Alfalfa, a higher value crop, commonly is better managed than grass pasture/hay.

Grain Crops

- Grain is grown in reclaimed wetland areas around the lake.
- The organic soils can be susceptible to wind erosion.
- Political pressure and incentive programs to restore wetlands impact current use and management decisions.

Forestland

- Much of the private non-industrial forestland is used for rural residences and not managed for timber production. Invasive, noxious weeds and overstocked stands are the dominant issues affecting both forestland productivity and the risk of wildfire.

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]

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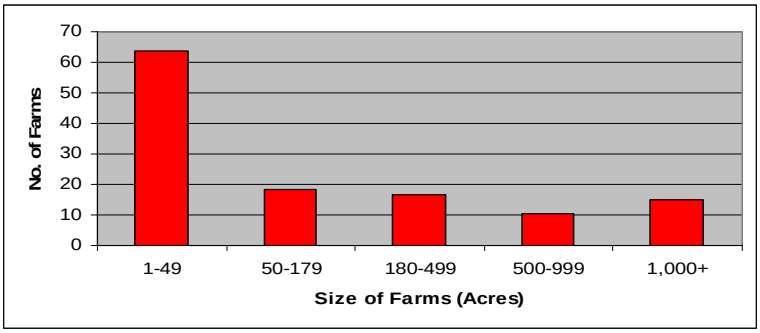
Number of Farms: 125

Number of Operators: 206

- Full-Time Operators: **71**
- Part-Time Operators: **135**



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

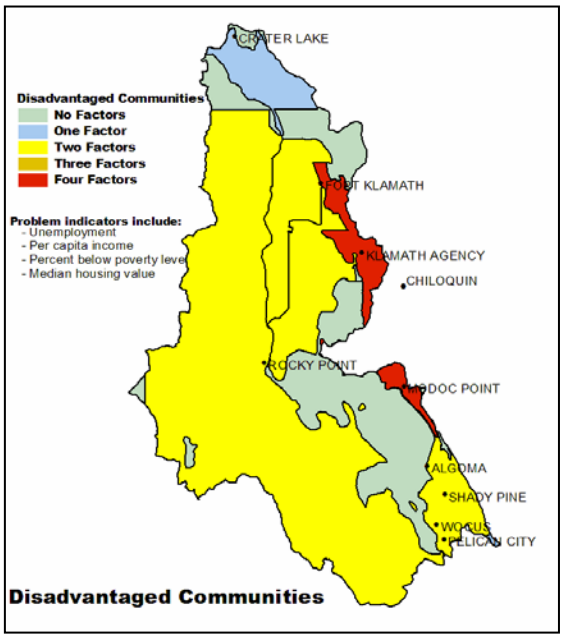
High: Viable agricultural operations in the subbasin tend to be those owned and operated by families. These operators are well aware of local resource concerns and have a relatively positive stewardship attitude.

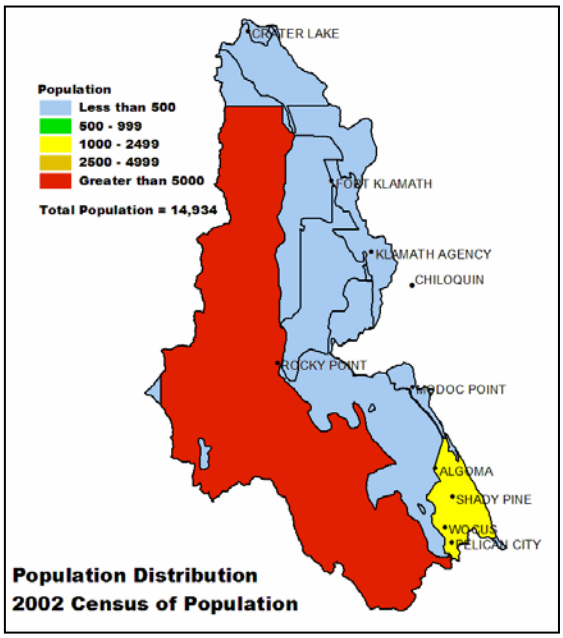
Moderate: Hobby farmers, which have smaller acreages and are absentee, tend to lack awareness of local resource concerns, lack resources to adopt conservation practices, and require significantly more time to inform, persuade, and assist with natural resource management. Absentee landowners tend also to lack ties to the community that normally are requisite to widespread conservation diffusion in a watershed.

Evaluation of Social Capital[/16]

Largely because of the influx of new and absentee landowners, the communities in the subbasin do not have a lot of experience with working together to solve local problems. The community's greatest strengths seem to be good participation in agricultural organizations, effective local leadership, and good media coverage of local issues.

As of late, however, the community's agricultural landowners have started to work together occasionally and to engage in concerted activities that support local resource management. As community-wide interest in local resource concerns increases and local leadership becomes involved, the diffusion of conservation in the subbasin can be expected to increase.





Progress / Status

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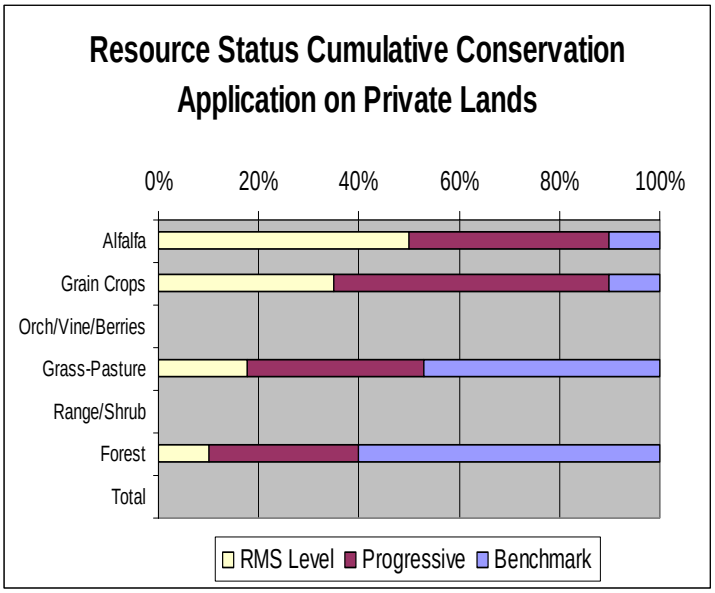
PRMS Data	FY00	FY01	FY02	FY03	FY04	Avg / Year	Total
Total Conservation Systems Planned (Acres)	233	0	0	1,790	7,709	1,946	9,732
Total Conservation Systems Applied (Acres)	0	216	0	0	2,000	443	2,216
Conservation Treatment Acres							
Waste Management (Number)	0	0	0	0	0	0	0
Buffers (Acres)	0	0	0	0	0	0	0
Erosion Control (Acres)	0	0	0	0	0	0	0
Irrigation Water Management (Acres)	0	0	0	12	0	3	12
Nutrient Management (Acres)	0	0	0	0	0	0	0
Pest Management (Acres)	0	0	0	0	0	0	0
Prescribed Grazing (Acres)	0	0	0	12	6,553	1,313	6,565
Trees & Shrubs (Acres)	0	0	0	0	0	0	0
Conservation Tillage (Acres)	0	0	0	0	0	0	0
Wildlife Habitat (Acres)	0	0	0	0	0	0	0
Wetlands (Acres)	0	0	0	0	0	0	0



- Progress over the last 5 years has been focused on:
  - Prescribed grazing on irrigated pasture.
- A high level of conservation management is applied to most irrigated grain and alfalfa.
- Pasture commonly is not intensively farmed because of a lack of adequate water and grazing management. A majority of ranches are operated by absentee landowners or lessees.
- Most private industrial forestland meets State forest practice requirements.
- High cost and unreliable markets limit forest management activities on private non-industrial forestland. Landowners commonly have rural residences in forested areas because of their aesthetic and recreational value.

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): **602 acres**
- 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.