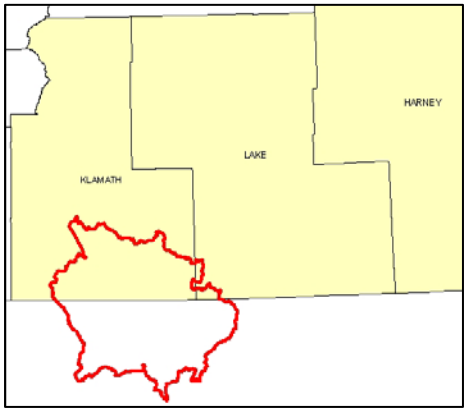
Lost River – 18010204

8-Digit Hydrologic Unit Profile

FINAL

SWCD	Acres
Klamath	793,904
Lakeview	41,754



Introduction

The Lost River 8-Digit Hydrologic Unit Code (HUC) subbasin is comprised of 835,500 acres in the Oregon portion of the watershed. Thirty-eight percent of the land is forest, twenty–five percent is range, and the remaining land is grain crops, hay and pasture. There are twelve permitted CAFOs and over 15,000 permitted animals in the subbasin. Resource concerns include: soil erosion, poor soil condition, diminishing water quality, aquatic habitat, noxious weeds, inadequate irrigation water management, and grazing 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 794 farms and 1,311 operators in the subbasin. Most operators of large farms have adopted conservation systems. New farmers, with small operations, tend to have a positive view of conservation but often lack the time, money, and technical resources to readily adopt conservation systems. Additional financial and technical assistance will help diffuse conservation among the growing number of small, part-time farmers in the subbasin.

The Klamath Falls NRCS Service Center, the Klamath Soil and Water Conservation District, Klamath Watershed Council, and other local conservation organizations provide conservation assistance in the subbasin.

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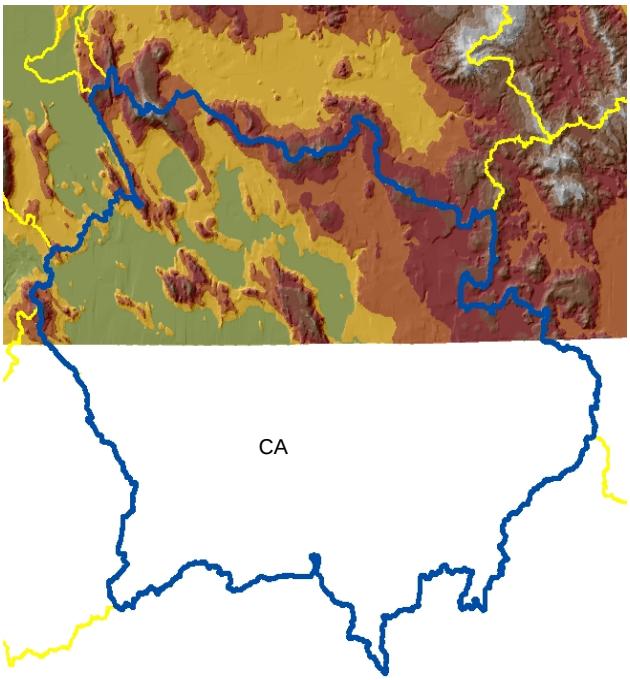
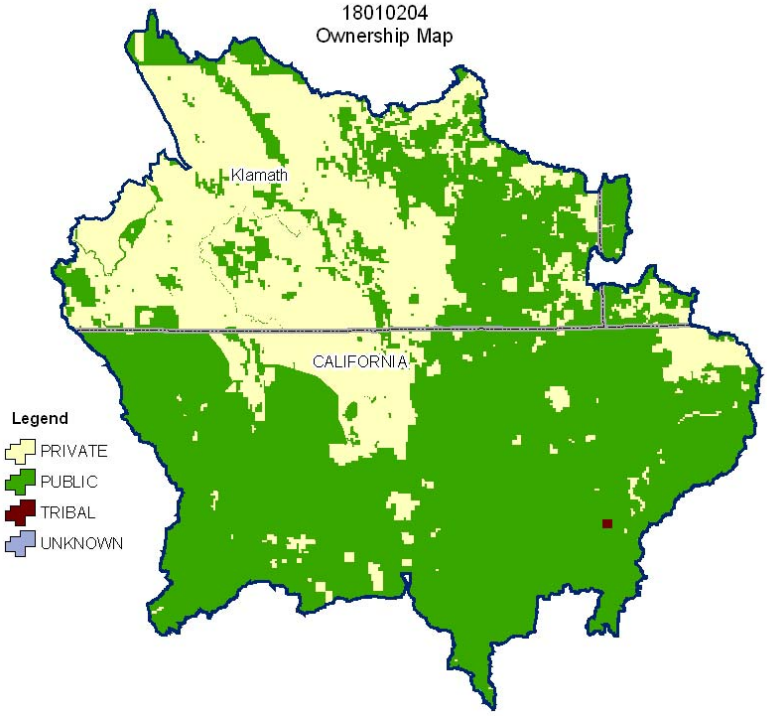
Relief Map





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	158,200	19%	161,600	19%	0	0%	321,500	38%
Grain Crops	*	--	120,900	14%	0	0%	129,000	15%
Conservation Reserve Program Land [a]	0	0%	*	--	0	0%	*	--
Grass/Pasture/Hay	13,900	2%	103,300	12%	0	0%	117,900	14%
Orchards/Vineyards	0	0%	0	0%	0	0%	0	0%
Row Crops	*	--	16,600	2%	0	0%	18,000	2%
Shrub/Rangelands	122,300	15%	85,400	10%	0	0%	209,500	25%
Water/Wetlands/Developed/Barren	*	--	28,900	3%	0	0%	39,400	5%
Oregon HUC Totals [b]	**312,400**	**37%**	**516,800**	**62%**	**0**	**0%**	**835,400**	**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 32 percent of private forest is in industrial forest ownership (NRCS, Upper Klamath Basin Rapid Subbasin Assessments, 2003).
- Approximately 266,300 acres are irrigated with 70 percent of the water provided through the US Bureau of Reclamation Irrigation Project (NRCS, Upper Klamath Basin Rapid Subbasin Assessments, 2003).
- Over 40 percent of the rangeland is dominated by juniper (NRCS, Upper Klamath Basin Rapid Subbasin Assessments, 2003).

Irrigated Lands (1997 NRI[13] Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	33,800	33%	4%
	Uncultivated Cropland	38,400	38%	5%
	Pastureland	30,200	29%	4%
	Total Irrigated Lands	**102,400**	**100%**	**12%**

(Continued on the following pages)

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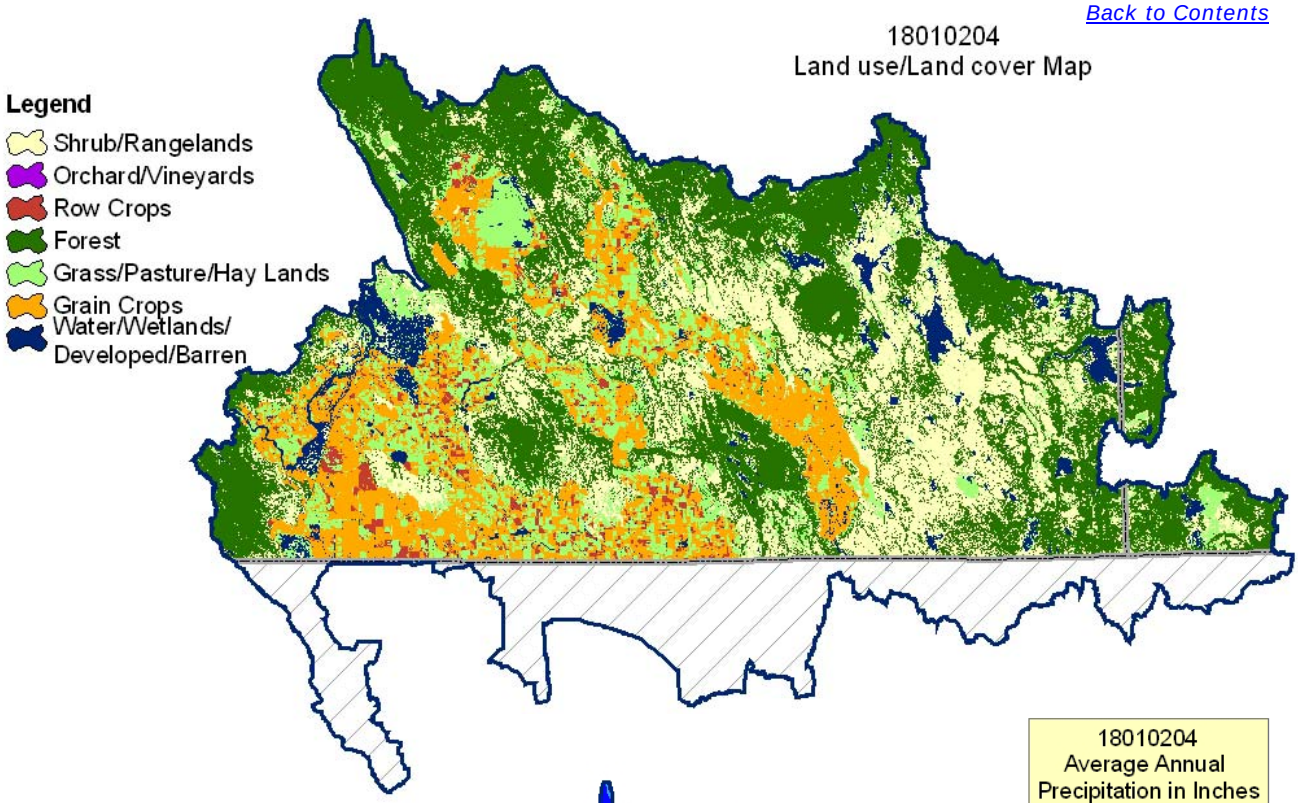

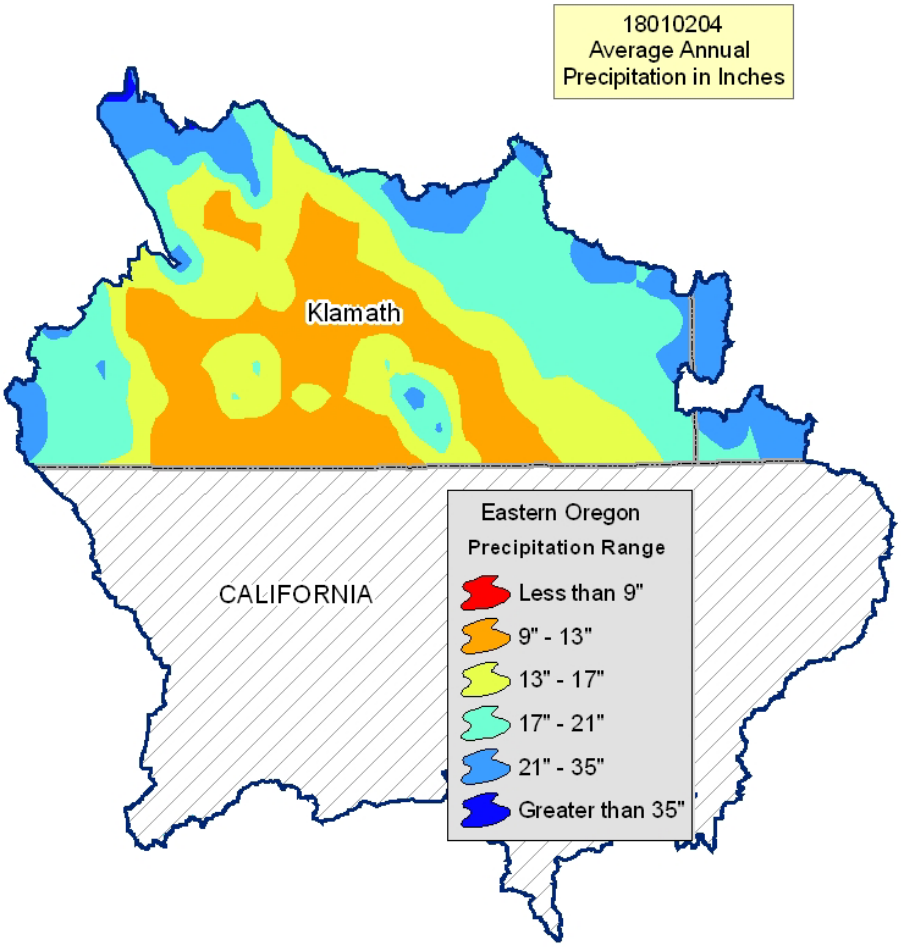

Common Resource Area Map

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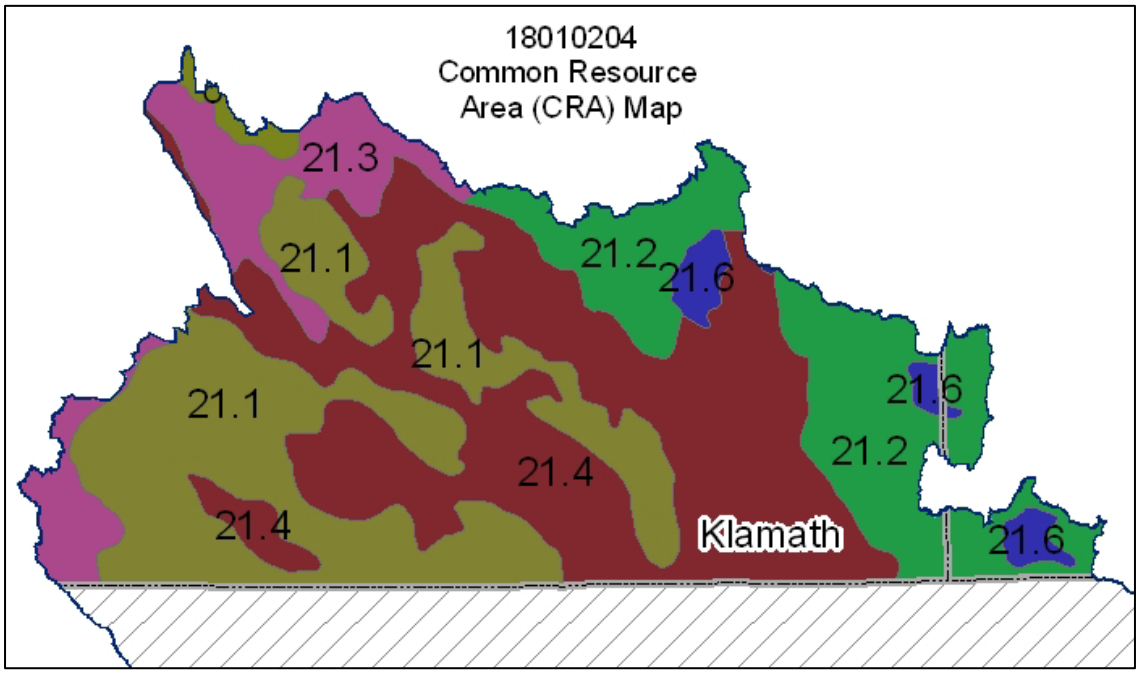
Only the major units are described below - for descriptions of all units within the HUC, go to: http://ice.or.nrcs.usda.gov/website/cra/viewer.htm



21.1 – Klamath and Shasta Valleys and Basins - Klamath-Goose Lake Warm Wet Basins: This unit is characterized by floodplains and terraces in the warm basins. Temperature regime is mesic; moisture regime is xeric. The basins this unit is found in are Goose Lake Basin and the Klamath Basin. Most areas are cropped and supplemental irrigation may be needed. Dominant soils are Goose Lake, Lakeview, Malin, Tulana, Drews, Deter and Fordney.

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.

21.4 – Klamath and Shasta Valleys and Basins - Warm Klamath Juniper Woodland: This unit is characterized by rangeland on hills and mountains. Temperature regime is mesic; moisture regime in xeric. Dominant soil is Lorella. Vegetation is dominated by bluebunch wheatgrass, and Wyoming big sage with significant amounts of western juniper. Precipitation is about 10 to 16 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

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		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	68,955	205,127
	Well	63,640	183,369
	Total Irrigated Adjudicated Water Rights	132,595	388,497
Stream Flow Data	OWRD 11485000 LOST RIVER AT OLENE, OR	**Total Avg. Yield**	233,236
		May - Sept Yield	41,265
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	949	--
	303d/TMDL Listed Streams (DEQ)	117	12%
	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	5,713	18%
	Grain Crops	10,626	33%
	Grass/Pasture/Hay	6,575	21%
	Orchards/Vineyards	0	0%
	Row Crops	1,509	5%
	Shrub/Rangelands – Includes CRP Lands	4,728	15%
	Water/Wetlands/Developed/Barren	2,612	8%
	Total Acres of 100-foot Stream Buffers	**31,763**	**--**
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	8,300	7%
	3 – severe limitations	67,300	53%
	4 – very severe limitations	35,700	28%
	5 – no erosion hazard, but other limitations	0	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	6,200	5%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	8,600	7%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%
	Total Croplands & Pasturelands	**126,100**	**--**

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

Animal Type	Dairy	Feedlot	Poultry	Swine	Mink	Other
No. of Permitted Farms	10	2	0	0	0	0
No. of Permitted Animals	10,875	4,400	0	0	0	0

Resource Concerns

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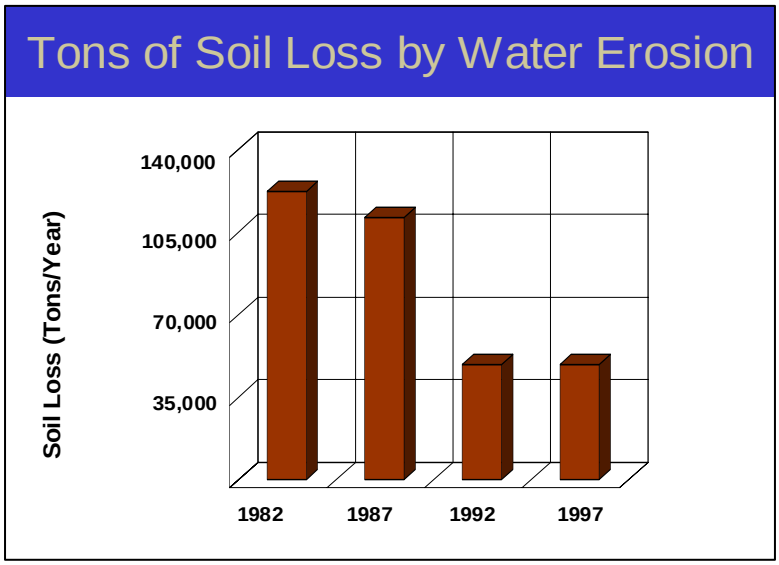
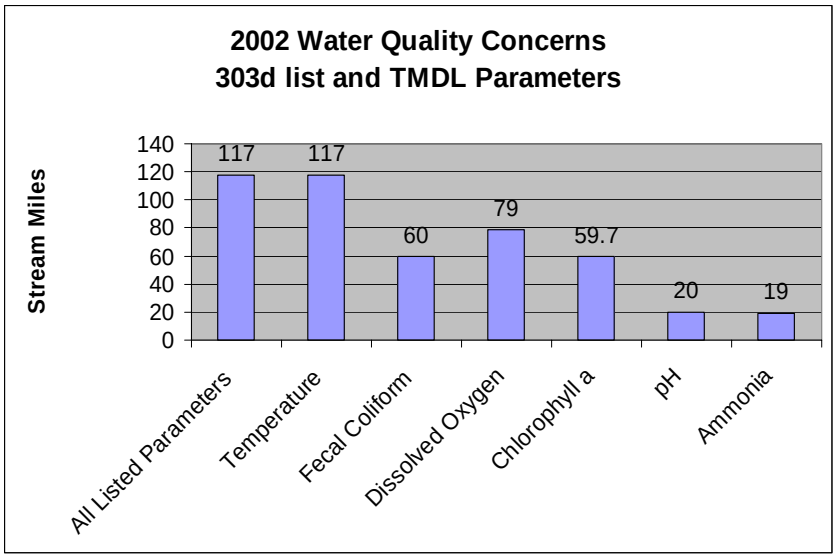


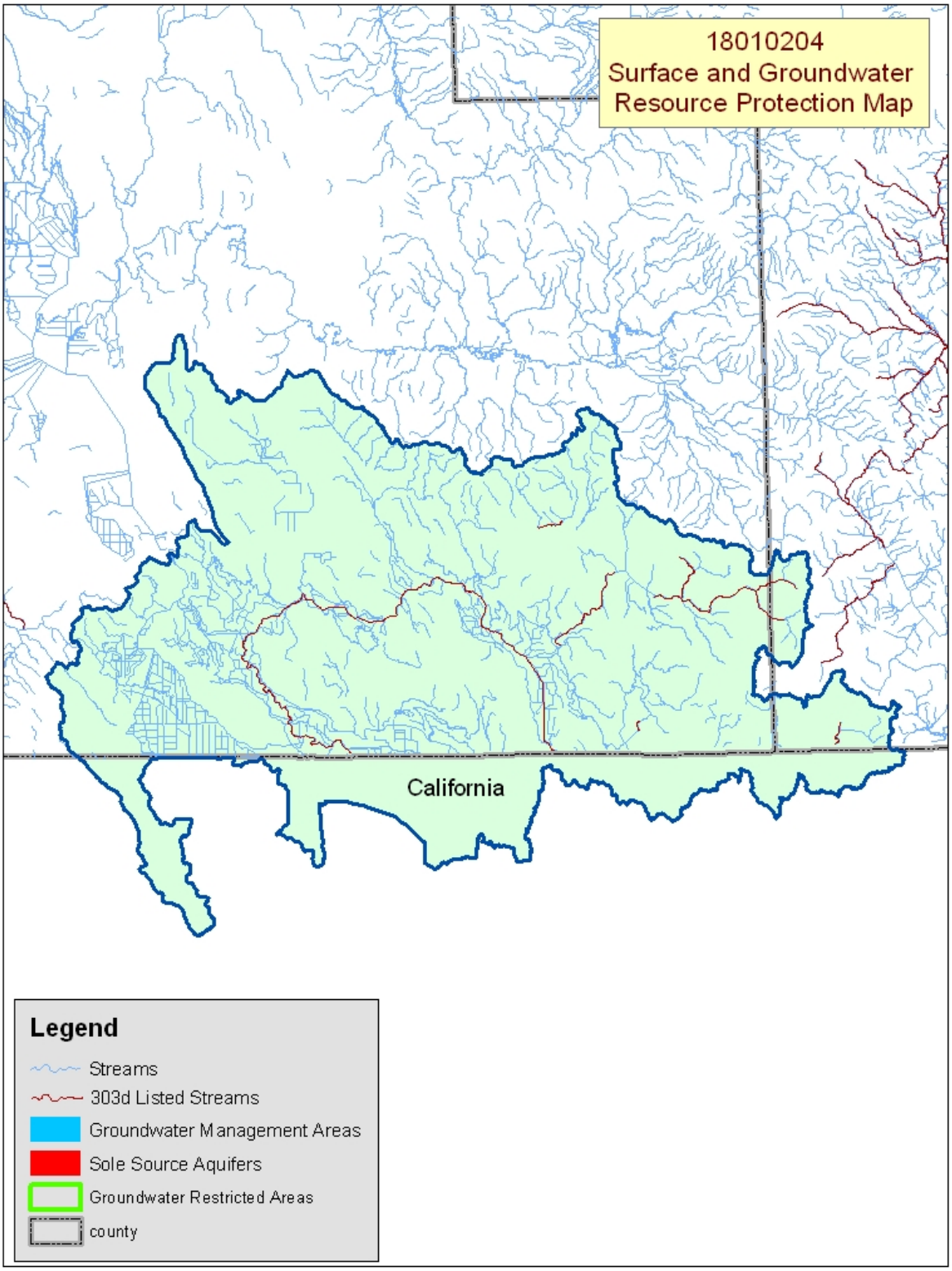
- Sheet and rill erosion by water on the subbasin croplands and pasturelands have been reduced by nearly 74 thousand tons of soil per year from 1982 to 1997.
- NRI estimates indicate 7,200 acres of the subbasin agricultural lands still had water erosion rates above a sustainable level in 1997.
- Controlling erosion not only sustains the long-term productivity of the land, but also affects the amount of soil, pesticides, fertilizer, and other substances that move into the nation's waters.
- Through NRCS programs many farmers and ranchers have applied conservation practices to reduce the effects of erosion by water. As a result, erosion rates on cropland and pastureland fell 59 percent from 1.0 to 0.4 tons/acre/year from 1982 to 1997.



- 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.
- Fecal coliform can be indicative of livestock wastes but also are associated with improperly operating on-site sewage disposal systems.
- DO, Chlorophyll a, and pH may be indicatative of high nutrient 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 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 (Upper Lost, Middle Lost & Tulelake)	Completed 2004
ODEQ TMDL's[8]		ODA Agricultural Water Quality Management Plans[9]	
Name	Status	Name	Status
Lower Klamath/Lost River Basin	Data Collection	Lost River	Completed
OWEB Watershed Council[10]		Watershed Council Assessments[11]	NWPCC Subbasin Plans & Assessments[18]
Klamath Watershed Council/Klamath River Watershed Working Group/Lost River/Cloverleaf 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**	**Grain Crops**	**Row Crops**	**Perennial Crops (Orch / Vine / Berries)**	**Shrub / Range**	**Forest**
Soil Erosion	Wind		X	X			
	Streambank	X					
	Irrigation Induced	X	X	X			
Soil Condition	Tilth, Crusting, Infiltration, Organic Matter	X	X	X		X	
	Soil Compaction	X		X		X	X
Water Quantity	Water Mgt. For Irrigated Land	X	X	X			
	Water Mgt. For Non-Irrigated Land					X	X
Water Quality, Surface	Nutrients & Organics	X	X	X			
	Suspended Sediments & Turbidity	X	X	X			
	Low Dissolved Oxygen	X	X	X			
	Temperature	X	X	X			
	Pathogens	X	X	X			
	Aquatic Habitat Suitability	X	X	X			
Air Quality	Airborne Sediment Causing Safety/Health Problems		X	X			
Plant Condition	Productivity, Health & Vigor	X				X	X
	Noxious and Invasive Weeds		X	X		X	X
Human Economics	High Risk & Uncertainty	X	X	X			
Human, Political	High Degree of Controversy	X	X	X		X	X

Grass / Pasture / Hay Lands

- While some irrigated pasture is well managed, many units are large with only boundary fences and wild flood irrigation making it difficult to practice intensive grazing or irrigation water management.
- Fields used to produce hay are usually better managed creating fewer resource concerns.

Grain and Row Crops

- Sprinkler irrigated row crops are usually grown in rotation with surface irrigated cereal grains.
- Wind erosion and poor soil condition can be problems with either grain or row crops if adequate residues are not maintained.
- Over irrigation can occur on surface-irrigated fields that have not been re-leveled for years or with sprinkler systems that have not been maintained.

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.
- Juniper also increases evapo-transpiration reducing both the water availability for range grasses and downstream subsurface discharge to the river.

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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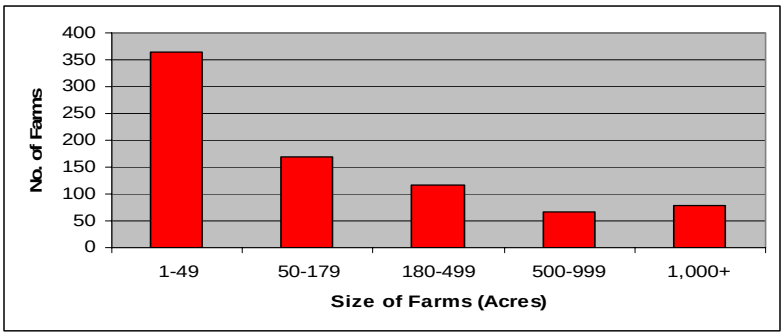


Number of Farms: 794

Number of Operators: 1,311

- Full-Time Operators: **454**
- Part-Time Operators: **857**

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

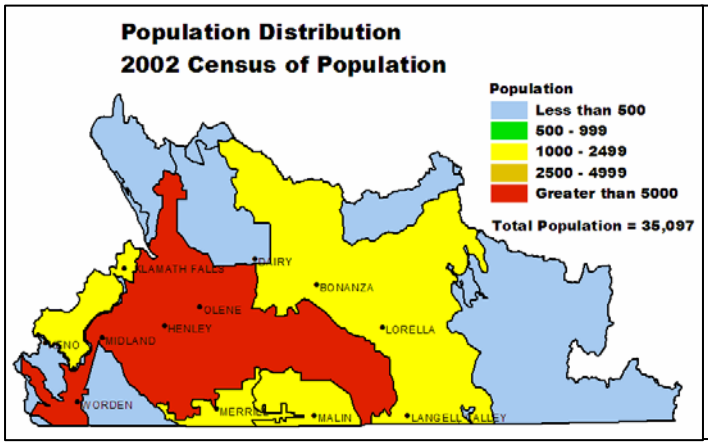
HIGH - Most operators of the large, viable agricultural operations in the Lost River subbasin are highly likely to have conservation plans, have already adopted many conservation practices, and have positive stewardship attitudes. These farms are in relatively good financial health and they live in a supportive community.

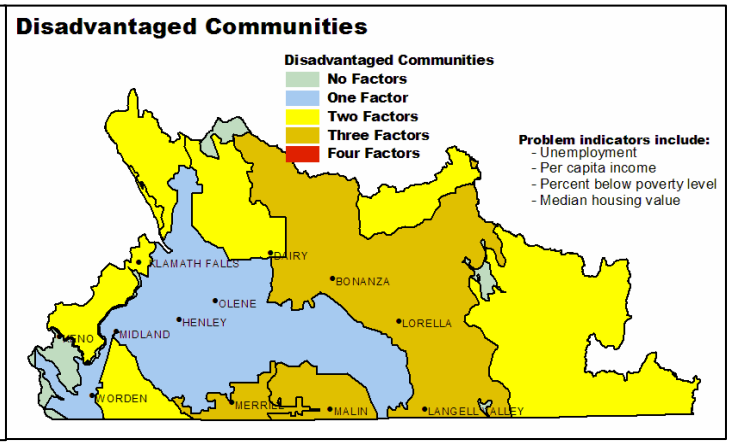
MODERATE – Operators of the small, hobby farms in the subbasin are also inclined to adopt conservation, are fairly well aware of local resource concerns, and generally perceive conservation systems positively. Unfortunately, most of these operators are not connected to the agricultural community, do not have conservation plans, have off-farm jobs and, therefore, do not have much time to try new resource management systems. Additional technical and financial assistance may increase conservation adoption among these landowners.

Evaluation of Social Capital[16]: MODERATE

Social capital, and the communities' ability to solve problems and support conservation, is estimated to be moderate in the Lost River subbasin. The community's greatest strengths appear to be a high level of volunteerism, good participation in agricultural organizations, and strong leadership. Residents in the subbasin tend to be well educated, financially stable, and connected to various media sources. Community projects tend to be completed.

Social capital will increase as more of the new, small-acreage farmers become involved in community issues, increase awareness of local resource concerns and the connection to their farm management, and become actively engage in local activities supporting local resource management.





Progress/Status

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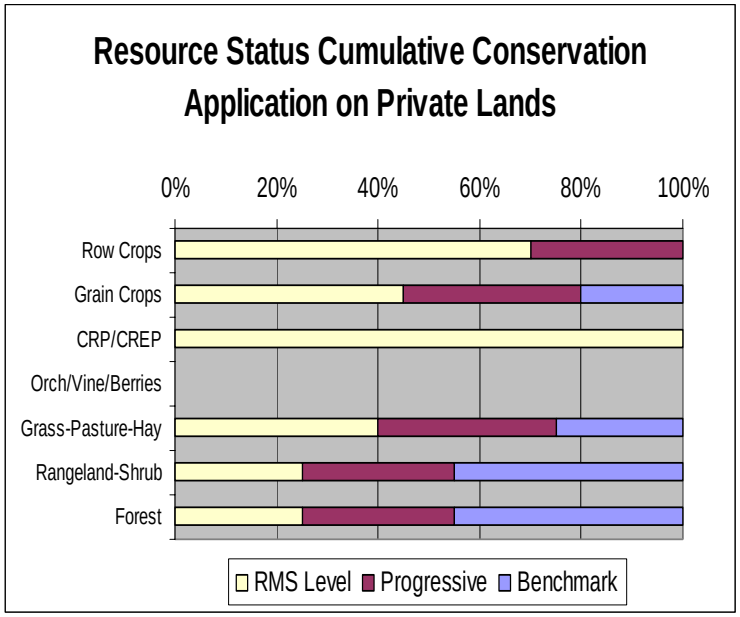
PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg/Year	Total
Total Conservation Systems Planned (Acres)	20,208	23,482	32,348	2,451	9,024	17,503	87,513
Total Conservation Systems Applied (Acres)	5,831	17,714	17,980	0	7,395	9,784	48,920
Conservation Treatment Acres							
Waste Management	3	0	0	0	0	1	3
Buffers	0	0	0	0	24	5	24
Erosion Control	669	463	14,860	0	1,501	3,499	17,493
Irrigation Water Management	669	20	1,032	754	8,573	2,210	11,048
Nutrient Management	0	36	0	0	165	40	201
Pest Management	510	0	0	0	0	102	510
Prescribed Grazing	13,323	9,559	2,425	244	3,059	5,722	28,610
Trees & Shrubs	0	0	0	0	3	1	3
Conservation Tillage	0	0	0	0	0	0	0
Wildlife Habitat	12,905	161	888	24	2,889	3,373	16,867
Wetlands	874	0	1,800	0	723	679	3,397



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

- Progress over the last five years has been focused on:
  - Prescribed grazing on irrigated pasture.
  - Erosion control
  - Irrigation water management
  - Wildlife habitat
- Most irrigated grain and alfalfa has a high level of conservation management being applied. In some cases irrigation water management can be improved.
- 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): **87 acres**
- Wetland Restoration Program (WRP): **1,146 acres**
- Conservation Reserve Enhancement Program (CREP): **87 acres**

Footnotes/Bibliography

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All data is provided "as is." There are no warranties, express or implied, including the warranty of fitness for a particular purpose, accompanying this document. Use for general planning purposes only.

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.