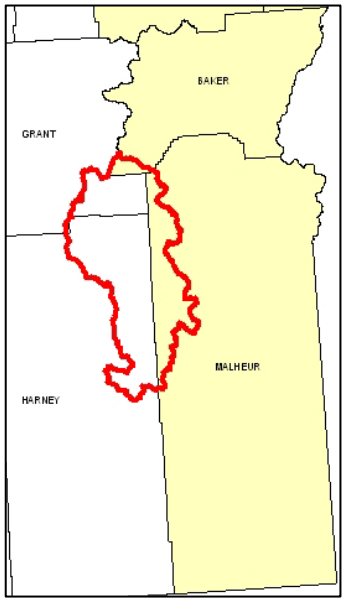
Upper Malheur - 17050116

8-Digit Hydrologic Unit Profile

FINAL

MARCH 2006



Introduction

The Upper Malheur 8-Digit Hydrologic Unit Code (HUC) subbasin is comprised of 1,558,100 acres in Harney, Malheur, Grant, and Baker Counties. Sixty-eight percent of the subbasin is rangeland, twenty-four percent is forestland, and seven percent is hayland and pastureland. Major resource concerns include streambank, gully, and sheet and rill erosion; invasive and noxious weeds; and insufficient water to meet irrigation needs. High capital and labor costs, labor availability, and the remoteness of the subbasin are concerns shared by many of the farmers and ranchers in the Upper Malheur subbasin.

There are 148 operations and 246 farmers and ranchers in the subbasin. Most operators are aware of local resource concerns, have a positive stewardship attitude, and are amenable to adopting conservation. Unfortunately, the perceived expense of implementing conservation and the lack of nearby technical assistance limit the adoption of conservation. Enhanced incentives and technical assistance are needed to increase the diffusion of conservation in the Upper Malheur subbasin.

The Ontario NRCS Service Center and Malheur County Soil and Water Conservation District provide much of the conservation assistance in the subbasin.

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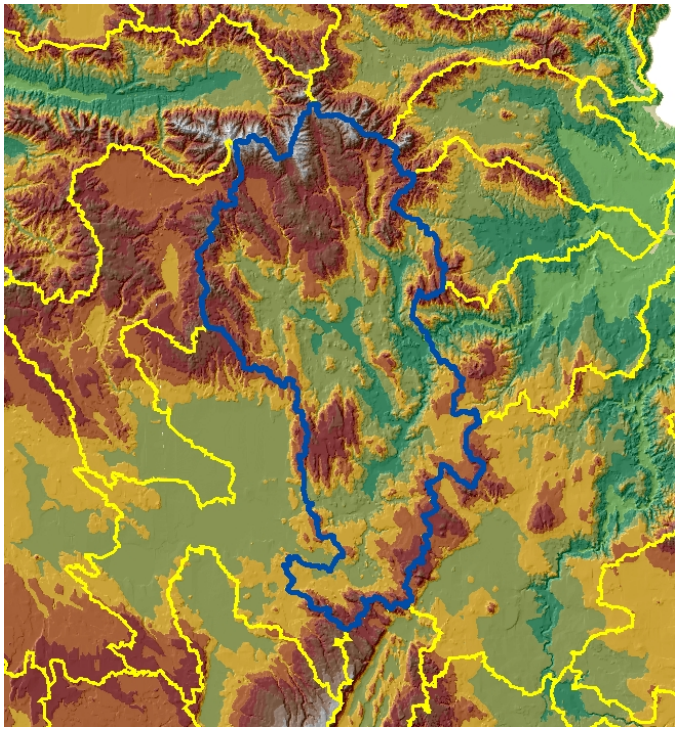

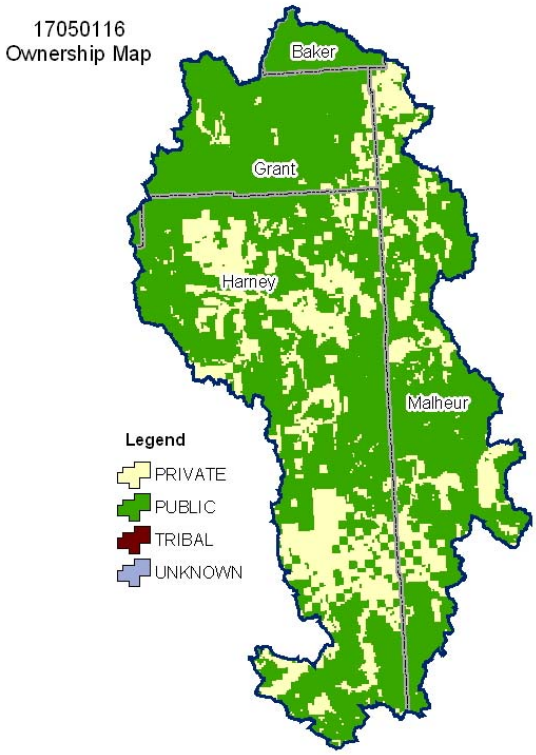

Produced by the Water Resources Planning Team Portland, OR

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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	343,000	22%	36,200	2%	0	0%	**379,200**	**24%**
Grain Crops	*	---	*	---	0	0%	*	---
Conservation Reserve Program Land [a]	*	---	*	---	0	0%	*	---
Grass/Pasture/Hay	62,500	4%	48,000	3%	0	0%	**110,500**	**7%**
Orchards/Vineyards	0	0%	0	0%	0	0%	**0**	**0%**
Row Crops	*	---	*	---	0	0%	*	---
Shrub/Rangelands	735,400	47%	317,000	20%	0	0%	**1,052,400**	**68%**
Water/Wetlands/Developed/Barren	*	---	*	---	0	0%	*	---
Oregon HUC Totals [b]	**1,149,400**	**74%**	**408,700**	**26%**	**0**	**0%**	**1,558,100**	**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:

- Most of the private forestland is non-industrial and is used for grazing and timber production.
- Although the NLCD identified 5,900 acres of row crops, none are grown in the watershed. In the past, some producers have tried growing turnips, corn, and potatoes, most of which was used as livestock feed because of a lack of nearby markets.
- Oats and peas are sometimes sown into new alfalfa stands for an early hay crop.

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	17,000	56%	1%
	Pastureland	13,400	44%	<1%
	Total Irrigated Lands	**30,400**	**100%**	**2%**

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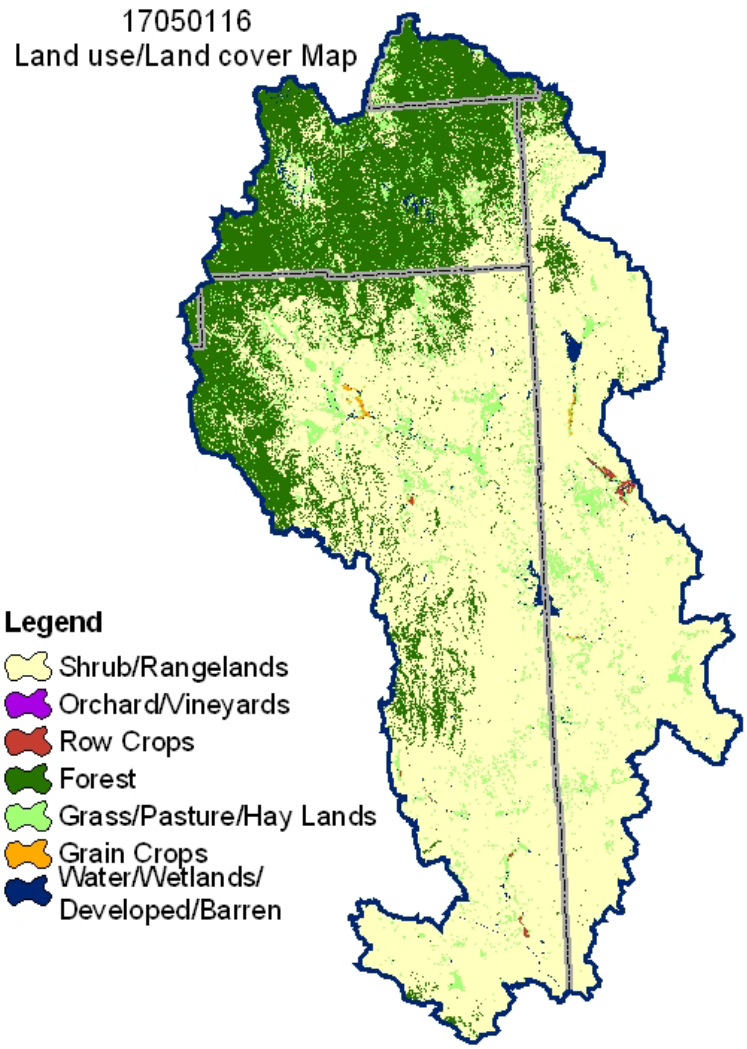

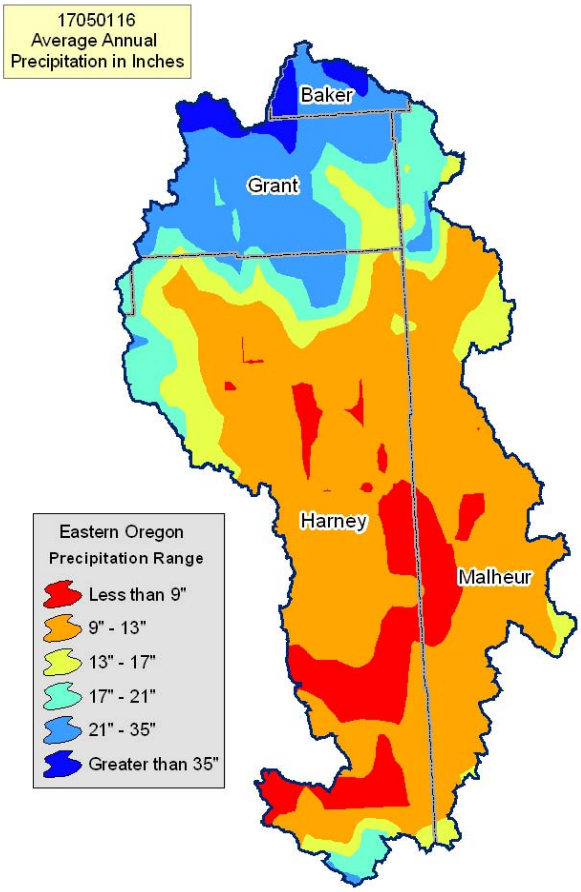

Common Resource Area Map

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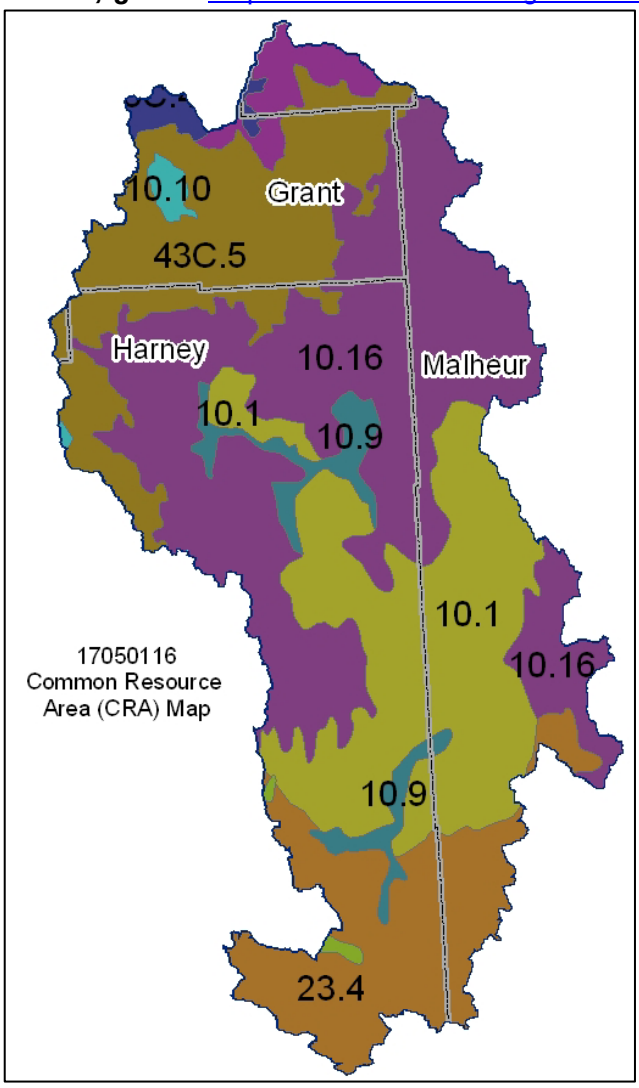
Only the major units are described below - for descriptions of all units within the HUC, go to: http://ice.or.nrcs.usda.gov/website/cra/viewer.htm



10.1 – Central Rocky and Blue Mountain Foothills - Warm Dry Blue and Seven Devils Mountain Foothills: This unit lies between the Blue and Wallowa Mountains in Oregon and the northwestern Snake River Plain. The unit is characterized by rangeland soils on hills and mountains associated with basalt and exposed tuffaceous sediment. The combined masses of the Cascade Range and the Blue and Wallowa Mountains block any maritime influence, creating a continental climate. As a result, plants are subject to wide range in temperature, a high rate of evapotranspiration, and high early-season moisture stress. The dominant soils are those of the Brogan, Simas, Ruckles, and Ruclick series. The temperature regime is mesic, and the moisture regime is aridic. The mean annual precipitation is 9 to 12 inches. The vegetation is Wyoming big sagebrush and bluebunch wheatgrass (warm day climate).

10.16 – Central Rocky and Blue Mountain Foothills - Cool Moist Blue Mountain Foothills: This unit is characterized by rangeland soils on hills and mountains associated with basalt. It is similar to the Lava Fields CRA except that this unit has higher precipitation and a xeric soil moisture regime. The dominant soils are those of the Ateron, Durkee, Menbo, Merlin, and Observation series. The temperature regime is frigid, and the moisture regime is xeric. The mean annual precipitation is 12 to 20 inches. The vegetation is dominantly mountain big sagebrush and Idaho fescue (cool, moist climate).

23.4 – Malheur High Plateau - High Lava Plains: This unit is on basalt plateaus and the escarpments of fault-block mountains. The temperature regime is frigid or mesic, and the moisture regime is primarily aridic. The soils typically are 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.

43C.5 - Blue and Seven Devils Mountains - Continental Zone Highlands: This unit is characterized by some of the lower precipitation and warmer temperature areas within the MLRA. The bedrock is typically basalt and rhyolite, which result in shallow, gravelly and cobbly soils. The temperature regime is frigid, and the moisture regime is xeric. The vegetation is dominantly ponderosa pine, scattered Douglas-fir, western juniper, bitterbrush, and mahogany. Ash-influenced soils typically are absent.

Physical Description – Continued

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		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	38,618	114,513
	Well	1,464	4,582
	Total Irrigated Adjudicated Water Rights	40,082	119,095
Stream Flow Data	USGS 13215000 MALHEUR R BE WARM SPRINGS RES., NR RIVERSIDE, OR	**Total Avg. Yield**	140,383
		May – Sept. Yield	104,095
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	900	---
	303d/TMDL Listed Streams (DEQ)	216	24%
	Anadromous Fish Presence (StreamNet)	0	0%
	Bull Trout Presence (StreamNet)	104	12%
		ACRES	**PERCENT**
Land Cover/Use[2] Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer	Forest	20,565	25%
	Grain Crops	129	0%
	Grass/Pasture/Hay	7,802	10%
	Orchards/Vineyards	0	0%
	Row Crops	319	0%
	Shrub/Rangelands – Includes CRP Lands	50,974	63%
	Water/Wetlands/Developed/Barren	1,391	2%
	Total Acres of 100-foot Stream Buffers	**81,180**	**---**
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	26,600	61%
	3 – severe limitations	17,000	39%
	4 – very severe limitations	0	0%
	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	**43,600**	**---**

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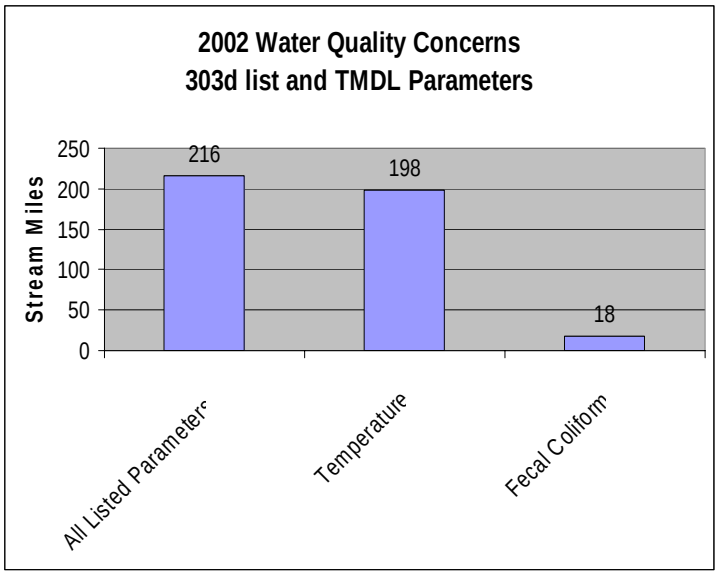
Tons of Soil Loss by Water Erosion: Due to the limited amount of non-Federal cropland and pastureland within this HUC, no reliable NRI soil loss estimates are available.



- Ninety-two percent of the listed stream miles exceed State water quality standards for temperature. Elevated stream temperatures may be due to inadequate riparian shade, stream channel widening, and other anthropogenic or natural causes.
- Fecal coliform can be indicative of livestock waste, but it also is associated with improperly operating onsite sewage disposal systems.
- 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	None	None
ODEQ TMDL's[8]		ODA Agricultural Water Quality Management Plans[9]	
Name	Status	Name	Status
None	None	Malheur	Completed
OWEB Watershed Council[10]	Watershed Council Assessments[11]		NWPCC Subbasin Plans and Assessments[18]
Owyhee Watershed Council Malheur Watershed Council	Malheur Basin Watershed Action Plan and Assessment		Malheur

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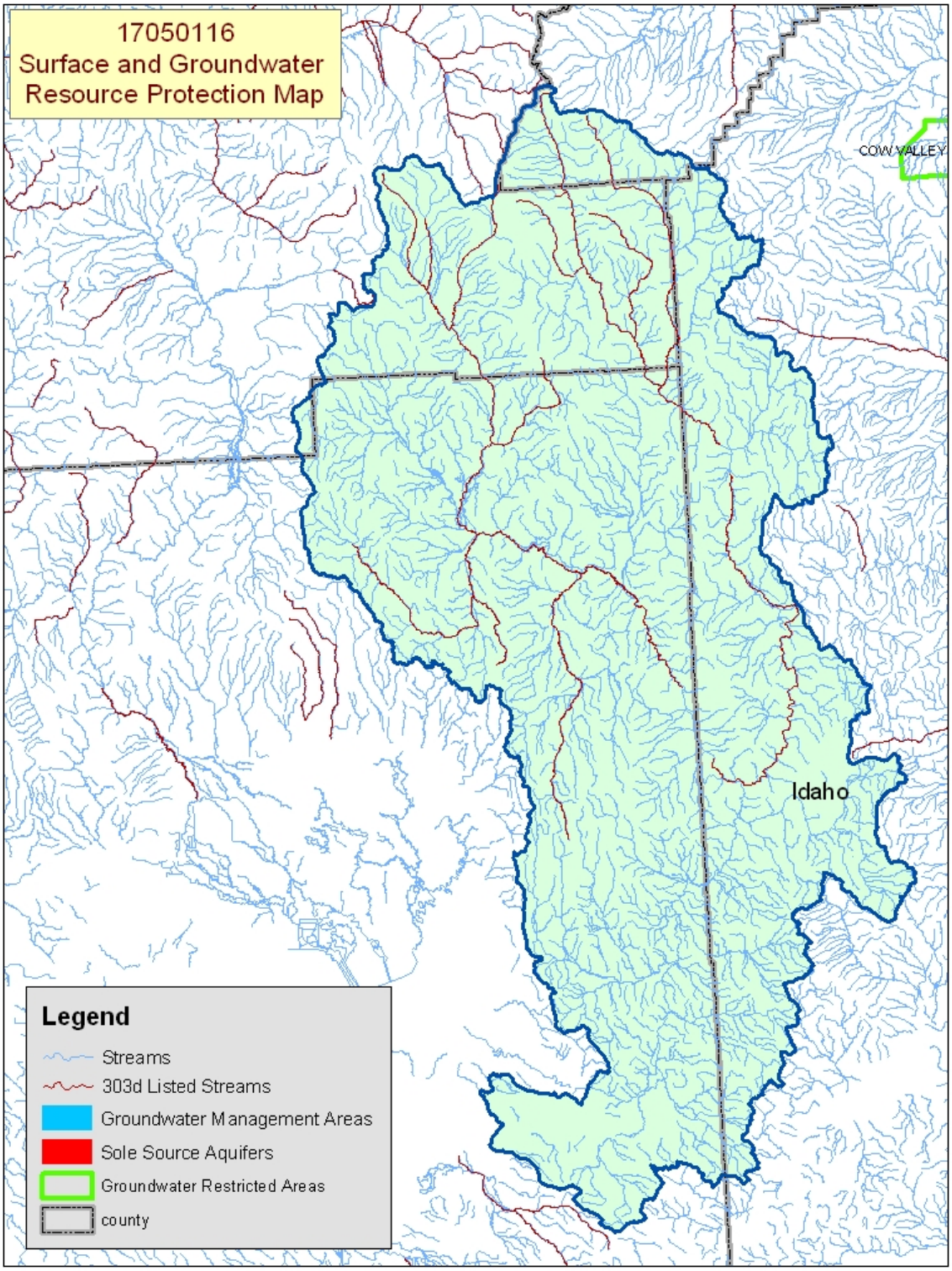

Map Footnote [17]

Resource Concerns - Continued

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Resource Concerns / Issues by Land Use							
SWAPA +H Concerns	**Specific Resource Concern / Issue**	**Grass \ Pasture \ Hay**	**Grain Crops**	**Row Crops**	**Perennial Crops (Orch / Vine / Berries)**	**Shrub / Range**	**Forest**
Soil Erosion	Sheet and Rill					X	
	Wind		X				
Water Quantity	Ponding and Flooding	X					
	Water Management for Irrigated Land	X	X				
Water Quality, Surface	Temperature					X	
Plant Suitability	Site and Intended Use Suitability	X				X	
Plant Condition	Productivity, Health, and Vigor	X					
Animal Habitat, Domestic	Water - Quantity & Quality					X	
Animal Habitat, Wildlife	Water - Quantity & Quality					X	
Human, Economics	High Capital/Financial Costs		X				
	Low or Unreliable Profitability	X				X	
Human, Political	Lack of Technical Assistance	X	X			X	X
	High Degree of Controversy	X	X			X	X

Grass / Pasture / Hay

- Water conservation is an issue for areas of irrigated hay and pasture on most ranches.
- Wind erosion can be a concern for areas of sandy soils where the forage has not been properly managed as cover or for maximum production.
- A low economic return limits adoption of appropriate conservation practices.

Grain Crops

- Wind erosion (sandy soils) and irrigation water management are the primary resource concerns.
- The high cost to update irrigation systems as compared to potential profit commonly hinders use of additional conservation practices.

Shrub / Rangeland

- Rangeland productivity can be reduced by the invasion of noxious weeds, annual grasses, brush, and juniper.
- Loss of riparian vegetation can contribute to stream warming.
- Low profit limits adoption of conservation practices.

Forestland

- Much of the private non-industrial forestland has been thinned in the recent past. Poor markets and lack of nearby mills have reduced timber harvesting and limited the need for additional forest management activities at this time.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES[12]	
THREATENED SPECIES	**CANDIDATE SPECIES**
Mammals- Canada lynx **Birds –** Bald eagle **Fish –** Borax Lake chub, Bull trout, Lahontan cutthroat trout **Plants –** Howell's spectacular thelypody, 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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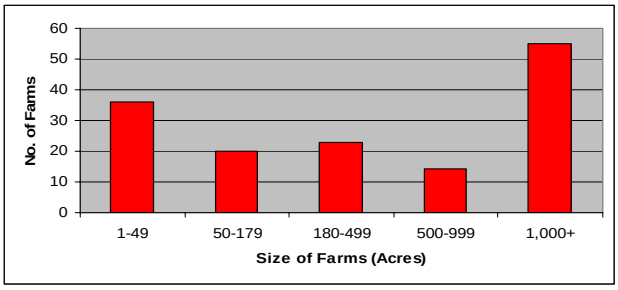


Number of Farms: 148

Number of Operators: 246

- Full-Time Operators: **98**
- Part-Time Operators: **148**

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

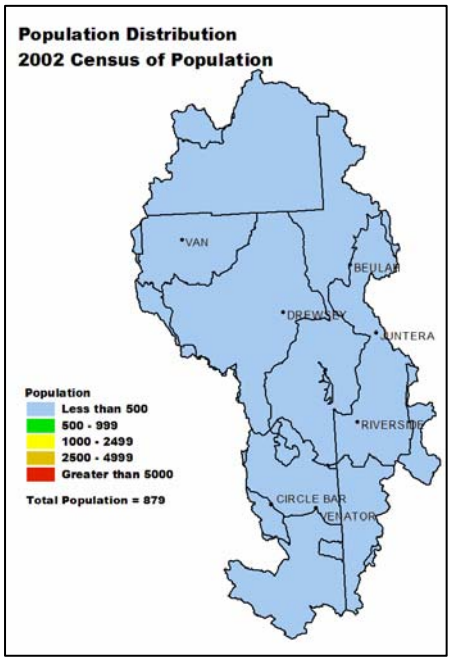
Most landowners in the Upper Malheur subbasin are aware of local resource concerns, have a positive stewardship attitude, and are amenable to adopting conservation practices. Many also appreciate the economic and environmental benefits of conservation. The greatest interest is in conservation practices that address grazing management, control of noxious weeds, and irrigation water management. Most recommended conservation practices can be implemented incrementally and are compatible with local management systems and equipment. The perceived high capital costs of conservation and lack of local technical assistance deter many landowners from adopting conservation systems.

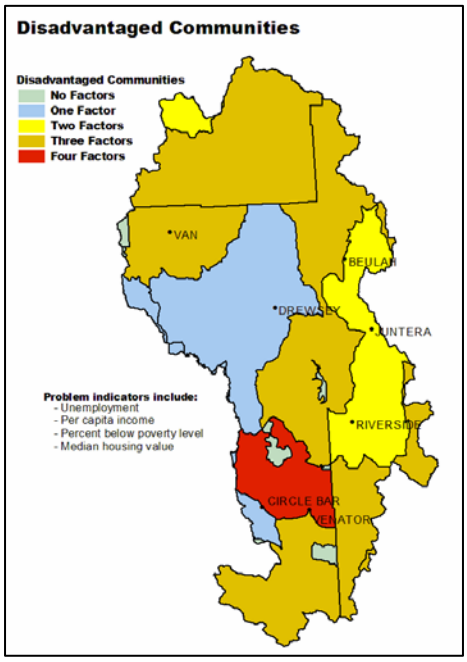
Additional technical and financial assistance may increase the adoption of conservation practices in the subbasin.

Evaluation of Social Capital[/16]: The remote geographic nature of the Upper Malheur subbasin does not lend itself to the development of communities.

Social capital and the ability of the community to solve problems and support conservation are estimated to be moderate. Recent trends indicate that the population of the subbasin is increasing slightly. The primary occupation of new landowners commonly is non-agricultural and not resource based. People moving to the area commonly do so for the rural, high-quality lifestyle and relatively inexpensive housing and property. Newcomers to the area tend to look at the natural resources as recreational opportunities, not as a means for making a living. In part, this has resulted in community interest shifting from agricultural and natural resource concerns to issues related to improving schools, transportation, health services, and so on.

Until resource management and agriculture regain the attention of the community, it is unlikely that the community will be a significant partner in the diffusion of conservation in the agricultural community.





Progress / Status

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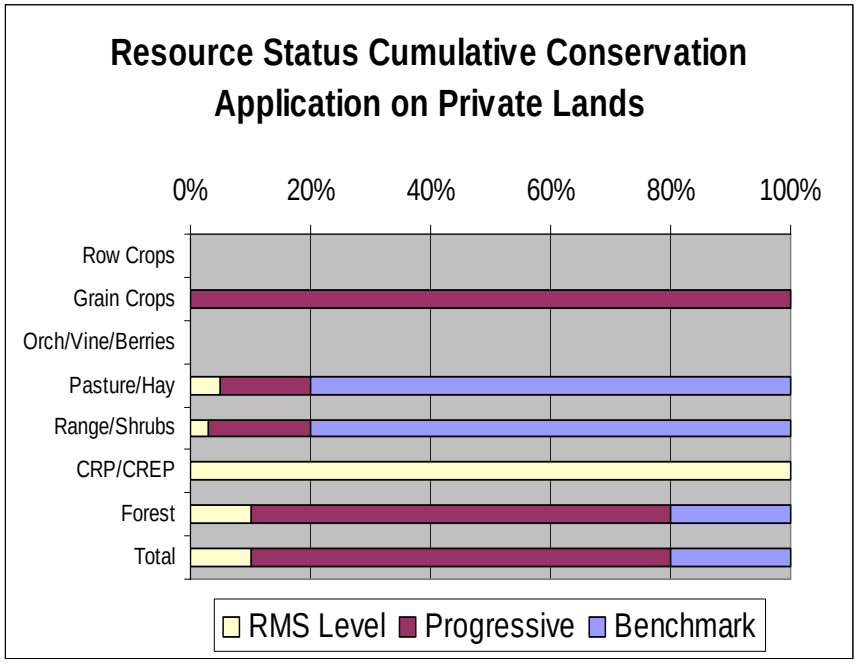
PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg / Year	Total
Total Conservation Systems Planned (Acres)	2,114	3,200	3,523	18,910	4,000	6,349	31,747
Total Conservation Systems Applied (Acres)	89	0	192	0	0	56	281
Conservation Treatment (Acres)							
Waste Management	0	0	0	0	0	0	0
Buffers	0	0	0	73	31	21	104
Erosion Control	75	0	0	0	0	15	75
Irrigation Water Management	675	0	0	0	0	135	675
Nutrient Management	0	0	0	0	0	0	0
Pest Management	177	0	35	0	0	42	212
Prescribed Grazing	2,236	1,832	1,511	0	0	1,116	5,579
Trees and Shrubs	0	0	0	0	0	0	0
Conservation Tillage	0	0	0	0	0	0	0
Wildlife Habitat	2,157	0	1,511	0	35	741	3,703
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:
  - Irrigation water management.
  - Prescribed grazing on pastureland and rangeland.
  - Wildlife habitat on uplands and in riparian areas.
- Invasive weeds and a lack of proper forage and grazing management is an ongoing concern.
- Proper grazing management and watering facilities for livestock and wildlife commonly are lacking on the rangeland.
- Rangeland provides important habitat for sage grouse nesting and strutting.
- Recently, landowners have been very interested in practices (using flow meters and soil moisture sensors and retrofitting sprinklers) that assist with irrigation water management and scheduling.

Lands Removed from Production through Farm Bill Programs

- Conservation Reserve Program (CRP): **179 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.