

Introduction

The Harney/Malheur Lakes 8-Digit Hydrologic Unit Code (HUC) subbasin is 950,000 acres in size. Forty percent is private land, and the remainder is public land. Sixty-one percent of the subbasin is rangeland, and the rest is pastureland, hayland, water, wetland, and forestland.

The main resource concerns on the rangeland are soil erosion, noxious weeds, and the quantity and quality of water for animal habitat. For the other land uses, resource concerns include wind erosion, irrigated water management, and water conservation. Low profitability, public controversy, and a lack of technical assistance are significant concerns for most landowners.

There are 178 farms and ranches in the subbasin. About 25 percent of the operations are less than 50 acres in size, about 50 percent are 50 to 1,000 acres in size, and the remaining 25 percent are more than 1,000 acres in size. Most of the farmers and ranchers rely on off-farm income. In recent years, more and more of the land has been bought by newcomers to the area and is under absentee and investor ownership or corporate ownership.

Conservation assistance is provided by the NRCS service center, Harney Soil and Water Conservation District, the soil survey office, and other partnerships and organizations.

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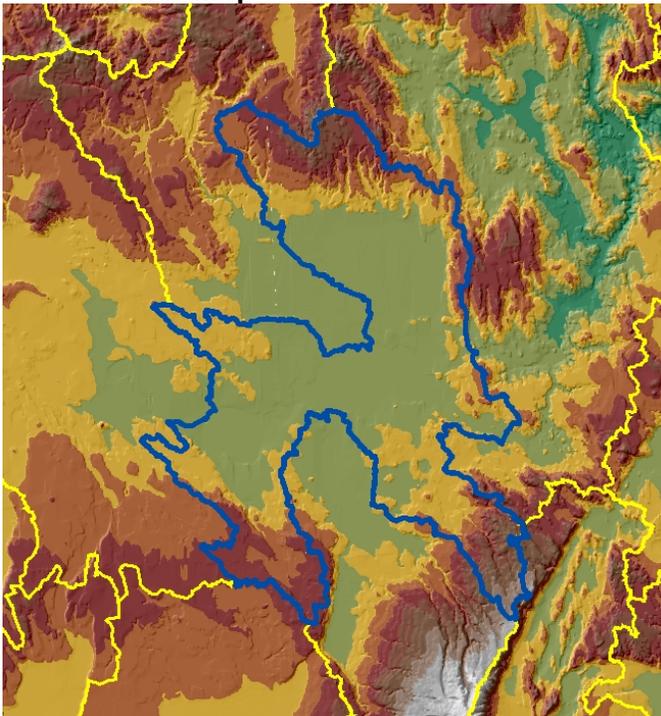
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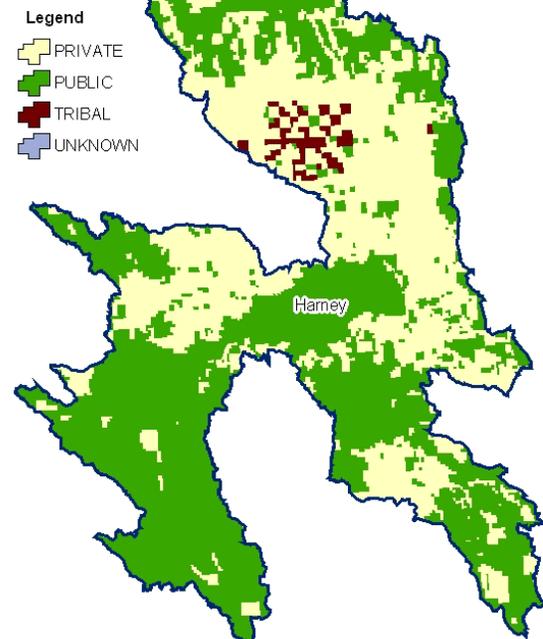
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Relief Map



17120001
Ownership Map



Physical Description

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ALL NUMBERS IN THIS PROFILE ARE FOR OREGON ONLY

Land Cover/Land Use (NLCD ²)	Ownership - (2003 Draft BLM Surface Map Set ¹)						Totals	%
	Public		Private		Tribal			
	Acres	%	Acres	%	Acres	%		
Forest	62,800	7%	16,100	2%	*	---	78,900	8%
Grain Crops	*	---	13,600	1%	*	---	13,900	1%
Conservation Reserve Program Land ^a	0	0%	0	0%	0	0%	0	0%
Grass/Pasture/Hay	36,600	4%	99,800	11%	5,800	1%	142,200	15%
Orchards/Vineyards	0	0%	0	0%	0	0%	0	0%
Row Crops	*	---	5,900	1%	0	0%	5,900	1%
Shrub/Rangelands	346,500	36%	226,500	24%	5,500	1%	578,500	61%
Water/Wetlands/Developed/Barren	97,400	10%	29,600	3%	*	---	130,300	14%
Oregon HUC Totals ^b	543,400	57%	391,500	41%	14,800	2%	949,700	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.

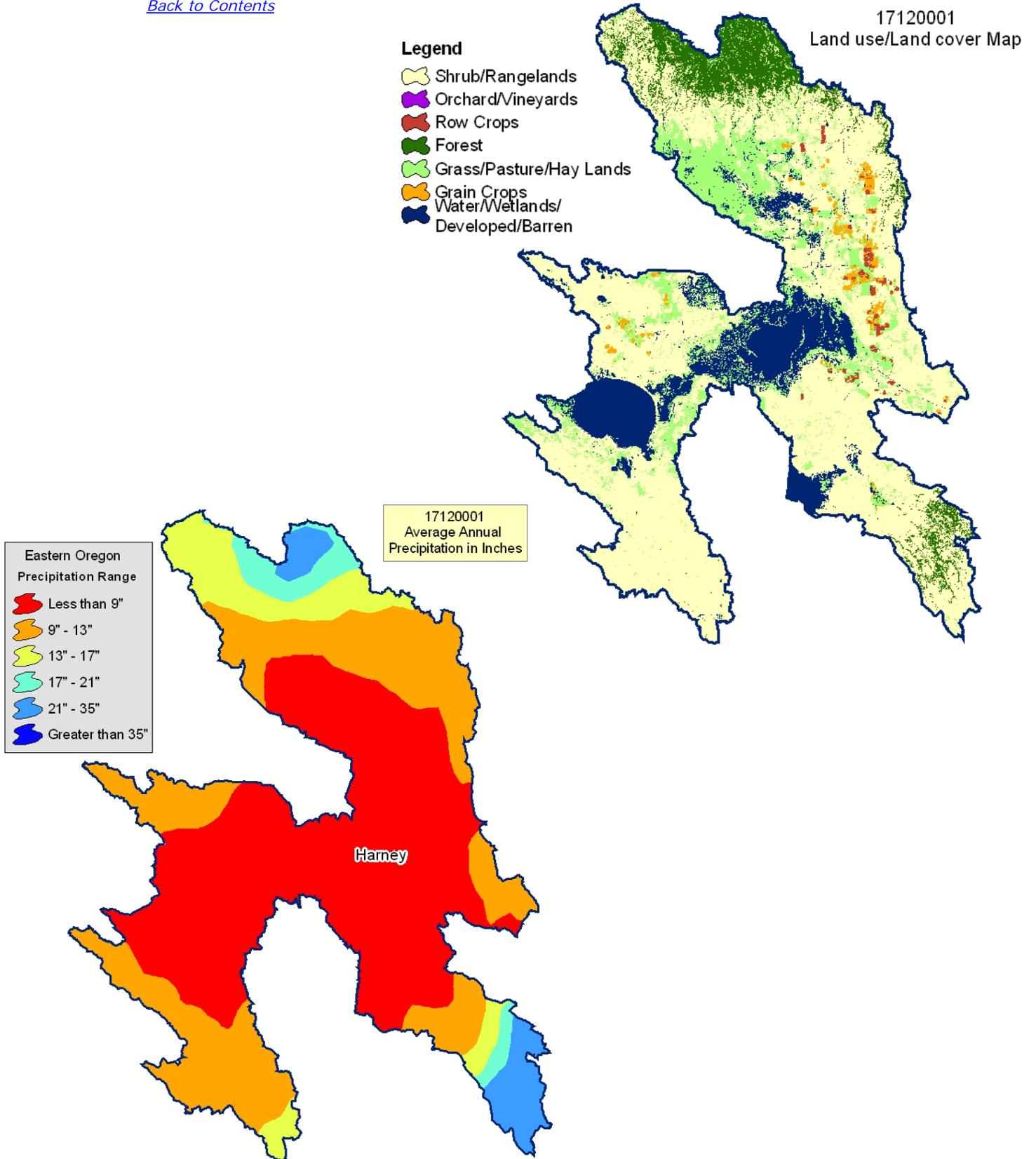
Special Considerations for this 8-Digit HUC:

- 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 has been used as livestock feed as there are no nearby markets.
- Oats and peas are sometimes sown into new alfalfa stands for an early hay crop.

Irrigated Lands (1997 NRI ³ Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	0	0%	0%
	Uncultivated Cropland	37,500	48%	4%
	Pastureland	40,900	52%	4%
	Total Irrigated Lands	78,400	100%	8%

(Continued on the following pages)

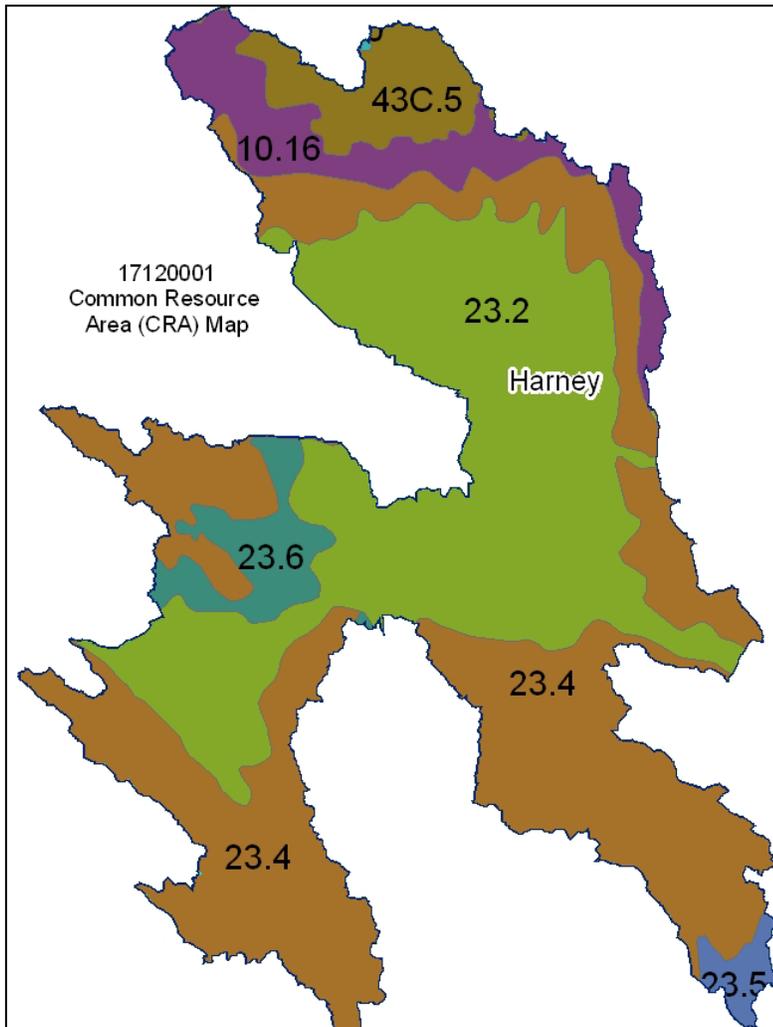
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Common Resource Area Map

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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>



23.2 - Malheur High Plateau - Cool High Desert Wetlands: This unit is characterized by cold, wet basins that have a minimal amount of ash, if any. The unit is primarily in Harney Basin. The soils range from well drained to very poorly drained and from nonsaline and nonsodic to very strongly alkaline. Numerous ponded wetlands are present. The temperature regime is frigid, and the moisture regime is aridic with aquic soil conditions. The dominant soils are those of the Ausmus, Poujade, Widowspring, and Lawen series.

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 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 high shrink-swell potential are common in depressions.

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. This unit is similar to the Lava Fields unit, but this unit receives more precipitation and has 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 with Idaho fescue (cool, moist areas).

43C.5 - Blue and Seven Devils Mountains - Continental Zone Highlands: This unit is characterized as one of the lowest precipitation and warmer temperature zones in 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 are typically absent.

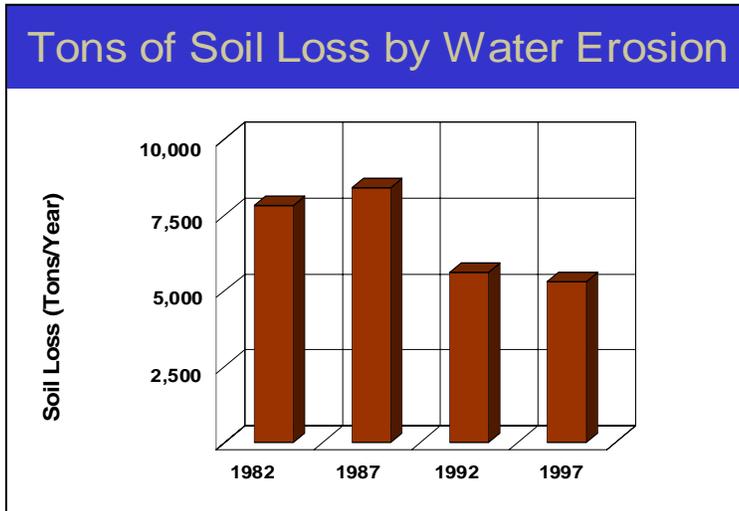
Physical Description – Continued

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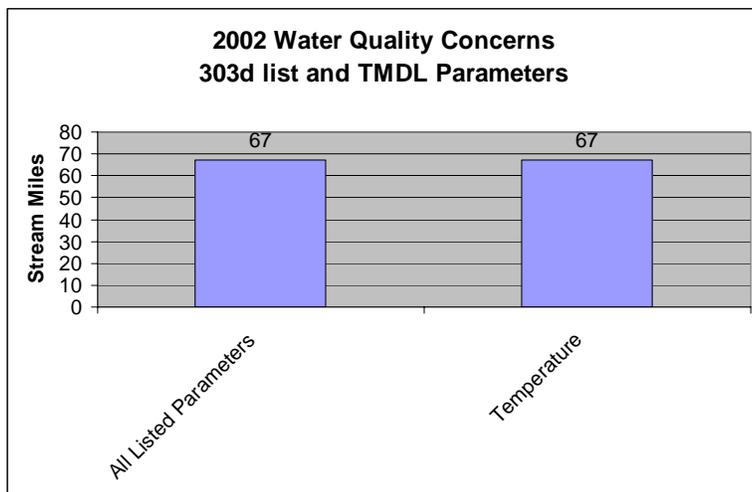
		ACRES	ACRE-FEET			
Irrigated Adjudicated Water Rights (OWRD ⁴)	Surface	29,069	85,036			
	Well	40,332	120,966			
	Total Irrigated Adjudicated Water Rights	69,400	206,002			
Stream Flow Data	USGS 10402000 MALHEUR LAKE OUTLET AT NARROWS, OR	Total Avg. Yield	8,594			
		May – Sept. Yield	4,466			
		MILES	PERCENT			
Stream Data ⁵ <i>*Percent of Total Miles of Streams in HUC</i>	Total Miles – Major (100K Hydro GIS Layer)	237	---			
	303d/TMDL Listed Streams (DEQ)	67	28%			
	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	4,369	15%			
	Grain Crops	203	1%			
	Grass/Pasture/Hay	3,865	14%			
	Orchards/Vineyards	0	0%			
	Row Crops	79	0%			
	Shrub/Rangelands – Includes CRP Lands	16,569	58%			
	Water/Wetlands/Developed/Barren	3,489	12%			
	Total Acres of 100-foot Stream Buffers	28,574	---			
Land Capability Class <i>(Croplands & Pasturelands Only)</i> <i>(1997 NRI³ Estimates for Non-Federal Lands Only)</i>	1 – slight limitations	0	0%			
	2 – moderate limitations	0	0%			
	3 – severe limitations	23,000	28%			
	4 – very severe limitations	31,100	38%			
	5 – no erosion hazard, but other limitations	4,100	5%			
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	22,900	28%			
	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	81,100	---			
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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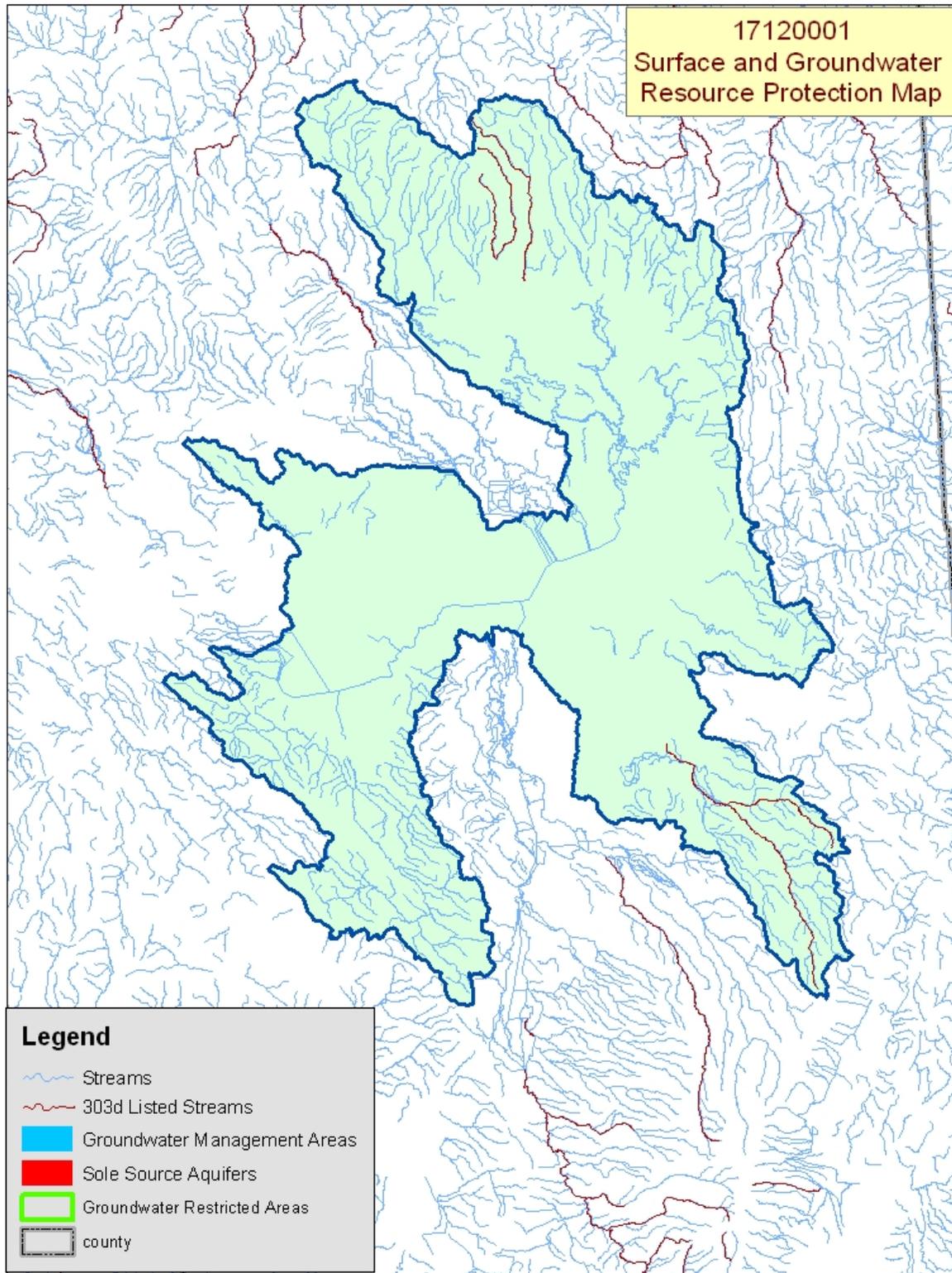
- ❖ Sheet and rill erosion by water on the cropland and pastureland have been reduced by approximately 2,500 tons of soil per year from 1982 to 1997.
- ❖ NRI estimates indicate that none of the subbasin agricultural land still had water erosion rates above a sustainable level in 1997.
- ❖ Controlling 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	Greater Harney Basin Malheur	Completed Completed
OWEB Watershed Council ¹⁰		NWPPC Subbasin Plans and Assessments ¹⁸	
Watershed Council Assessments ¹¹		Assessments ¹⁸	
Harney County Watershed Council, Malheur Watershed Council	Harney-Malheur Subbasin Assessment, Silvies Subbasin Assessment	None	

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Map Footnote [417](#)

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 & Rill					X	
	Wind		X				
Water Quantity	Ponding & Flooding	X					
	Water Management For Irrigated Land	X	X				
Water Quality, Surface	Temperature					X	
Plant Suitability	Site & Intended Use Suitability	X				X	
Plant Condition	Productivity, Health, & 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 in areas of irrigated hay and pasture on most ranches.
- Wind erosion can be a concern in areas of sandy soils where the forage has not been properly managed as cover or to maximize production.
- Low economic return limits adoption of appropriate conservation practices.
- Recently, landowners have been very interested in practices that assist with irrigation water management and scheduling (use of flow meters and soil moisture sensors and retrofitting of sprinklers).

Grain Crops

- Wind erosion in areas of sandy soils and irrigation water management are the primary resource concerns.
- The high cost as compared to potential profit commonly hinders use of updated irrigation systems.
- Recently, landowners have been very interested in practices that assist with irrigation water management and scheduling (use of flow meters and soil moisture sensors and retrofitting of sprinklers).

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 led to reduced timber harvesting and limited the need for additional forest management activity at this time.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES ¹²	
THREATENED SPECIES	CANDIDATE SPECIES
Mammals - Canada lynx	Birds – Yellow-billed cuckoo
Birds – Bald eagle	Amphibians and Reptiles –
Fish – Borax Lake chub, Lahontan cutthroat trout, Bull trout	Columbia spotted frog
Plants – Malheur wirelettuce	PROPOSED SPECIES None
ESSENTIAL FISH HABITAT¹³ - None	

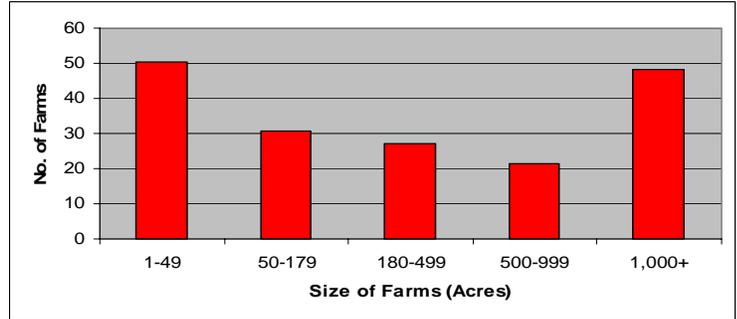
Census and Social Data^{/14}

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Number of Farms: 178

Number of Operators: 301

- Full-Time Operators: **114**
- Part-Time Operators: **187**



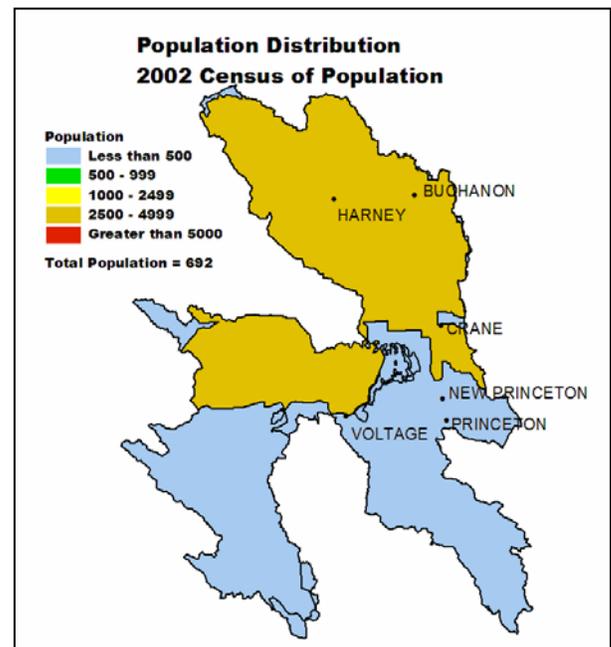
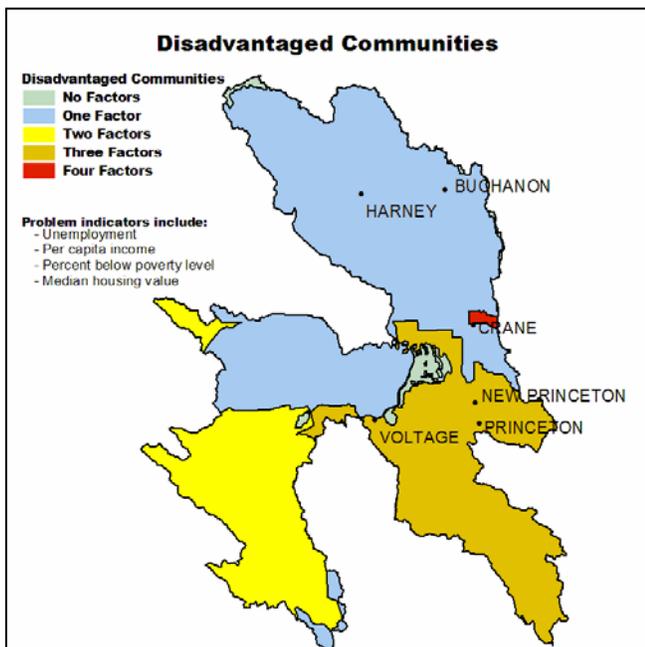
Estimated Level of Willingness and Ability to Participate in Conservation^{/15}: **High**

Full-time operators of viable agricultural operations in the Harney/Malheur Lakes subbasin tend to be amenable to adoption of conservation practices and systems. These operators are aware of local resource concerns and have a good idea of what can be done to address these concerns; however, they usually need technical and financial assistance as well as one-on-one discussions about the benefits of conservation to their operation before they can be persuaded to adopt new conservation systems.

Evaluation of Social Capital^{/16} **Moderate to high**

The physical distance between community members, local businesses, schools, churches, parks, and other community amenities is large; getting together commonly requires a drive of an hour or more each way. Many of the residents regularly put forth the effort, drive the distance, and work together to solve problems and complete projects.

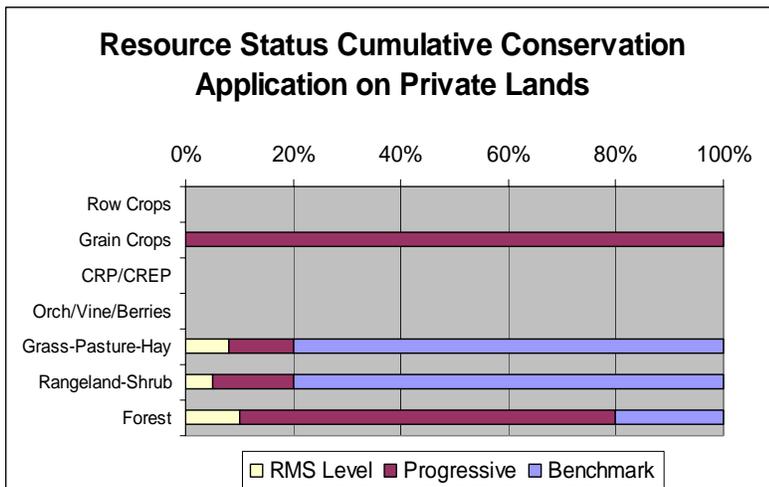
Local leadership and community organizations are able to, and sometimes do, play a role in facilitating the diffusion of conservation throughout the subbasin.



Progress/Status

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PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg/Year	Total
Total Conservation Systems Planned (Acres)	5,525	300	4,195	0	0	2,004	10,020
Total Conservation Systems Applied (Acres)	0	0	395	3,519	0	783	3,914
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)	108	0	0	0	0	22	108
Irrigation Water Management (Acres)	18	0	0	0	0	4	18
Nutrient Management (Acres)	0	0	0	0	0	0	0
Pest Management (Acres)	415	1,375	0	0	0	358	1,790
Prescribed Grazing (Acres)	334	0	155	139	0	126	628
Trees & Shrubs (Acres)	0	0	3	0	0	1	3
Conservation Tillage (Acres)	0	0	0	0	0	0	0
Wildlife Habitat (Acres)	2,957	0	4,546	139	851	1,699	8,493
Wetlands (Acres)	10	0	0	538	436	197	984



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

- ❖ Progress over the last 5 years has been focused on:
 - ~ Pest management on cropland
 - ~ Prescribed grazing on pastureland and rangeland
 - ~ Wildlife habitat management in riparian areas and on uplands
- ❖ Most grain is grown under center pivot or wheeline irrigation with good water and residue management.
- ❖ Much of the pasture is flood irrigated and lacks proper forage and grazing management.
- ❖ Rangeland commonly lacks proper grazing management and watering facilities for livestock and wildlife.
- ❖ Private forestland, largely non-industrial, has been thinned in the recent past.

Lands Removed from Production through Farm Bill Programs

- ❖ Conservation Reserve Program (CRP): **None**
- ❖ Wetland Restoration Program (WRP): **541 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/wlexport.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

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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>.