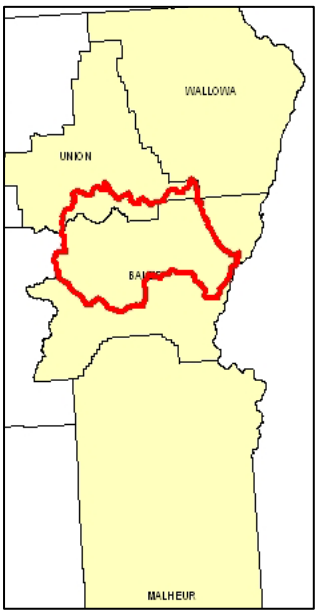
Powder River – 17050203

8-Digit Hydrologic Unit Profile

FINAL

JANUARY 2006



Introduction

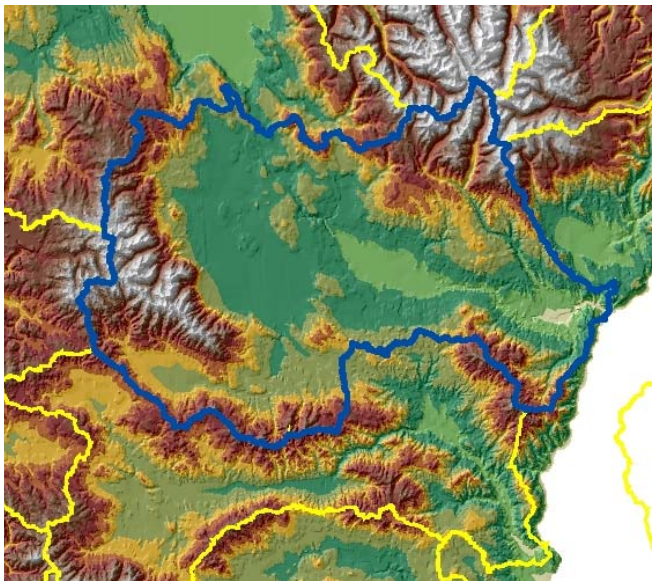
The Powder River 8-Digit Hydrologic Unit Code (HUC) subbasin is comprised of 1,096,900 acres, mostly in Baker County. Forty-two percent of the subbasin is rangeland, thirty-five percent is forestland, and eighteen percent is hayland and pastureland. About seventy-five percent of the forestland is grazed. About one-half the subbasin is privately owned, and the other one-half is publicly owned. There are six Confined Animal Feeding Operations and over 4,000 permitted animals in the subbasin. Major resource concerns include streambank and irrigation-induced erosion; invasive and noxious weeds; insufficient water to meet livestock, wildlife, and irrigation needs; impaired water quality; and loss of wildlife habitat. High costs, unreliable profits, inadequate incentives, and the lack of technical assistance limit conservation adoption among the ranchers in the Powder River subbasin.

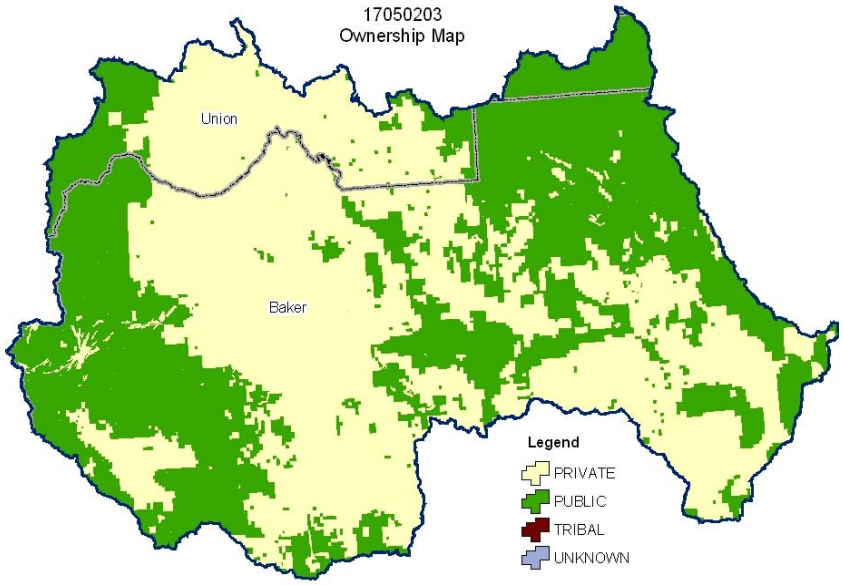
There are 579 operations and 957 ranchers in the subbasin. Most ranchers are well educated and aware of local resource concerns, have experience with conservation, seek out conservation information, and have a positive stewardship attitude. They also perceive the cost of conservation to be prohibitively high, thereby limiting the adoption of conservation systems. There is a need for additional risk-reducing incentives, *timely* technical assistance, and greater community support for the diffusion of conservation in the Powder River subbasin.

The Baker NRCS Service Center, the Keating, Baker Valley, Eagle Valley, and Burnt River Soil and Water Conservation Districts, and the Powder Basin Watershed Council provide much of the conservation assistance in the subbasin.

Profile Contents

Relief Map





Produced by the Water Resources Planning Team Portland, OR

Physical Description

Back to Contents

ALL NUMBERS IN THIS PROFILE ARE FOR OREGON ONLY

Land Cover/Land Use (NLCD[2])	Ownership - (2003 Draft BLM Surface Map Set[1])							
	Public		Private		Tribal		Totals	%
	Acres	%	Acres	%	Acres	%		
Forest	294,100	27%	94,900	9%	0	0%	**389,000**	**35%**
Grain Crops	*	---	16,900	2%	0	0%	**17,000**	**2%**
Conservation Reserve Program Land [a]	*	---	*	---	0	0%	*	---
Grass/Pasture/Hay	41,200	4%	159,000	14%	0	0%	**200,200**	**18%**
Orchards/Vineyards	0	0%	0	0%	0	0%	**0**	**0%**
Row Crops	*	---	*	---	0	0%	*	---
Shrub/Rangelands	148,100	14%	314,600	29%	0	0%	**462,700**	**42%**
Water/Wetlands/Developed/Barren	*	---	*	---	0	0%	**26,400**	**2%**
Oregon HUC Totals [b]	**496,000**	**45%**	**600,900**	**55%**	**0**	**0%**	**1,096,900**	**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:

Field Office estimates:

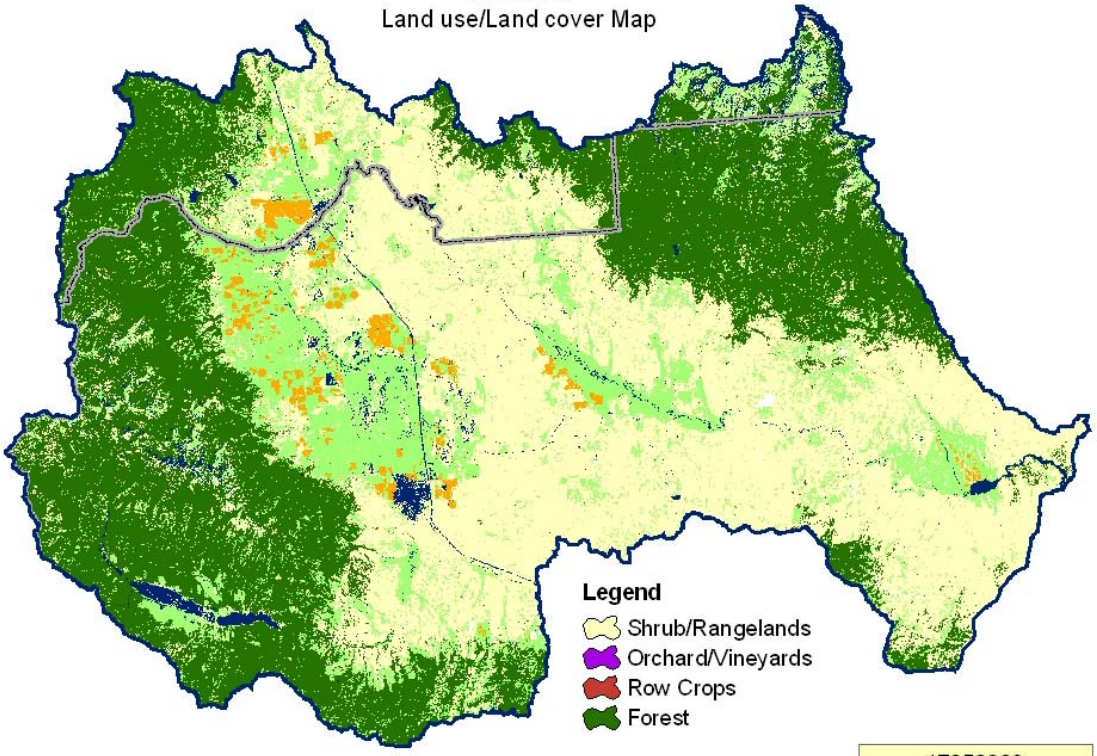
- Approximately 1,000 acres of irrigated potatoes and corn are grown in rotation with grain and alfalfa.
- Thirty percent of the private forestland is under industrial ownership and management.
- Seventy-five percent of the forestland is grazed by livestock.

Irrigated Lands (1997 NRI[3] Estimates for Non-Federal Lands Only)	Type of Land	ACRES	% of Irrigated Lands	% of HUC
	Cultivated Cropland	21,700	16%	2%
	Uncultivated Cropland	48,000	36%	4%
	Pastureland	62,300	47%	6%
	Total Irrigated Lands	**132,000**	**100%**	**12%**

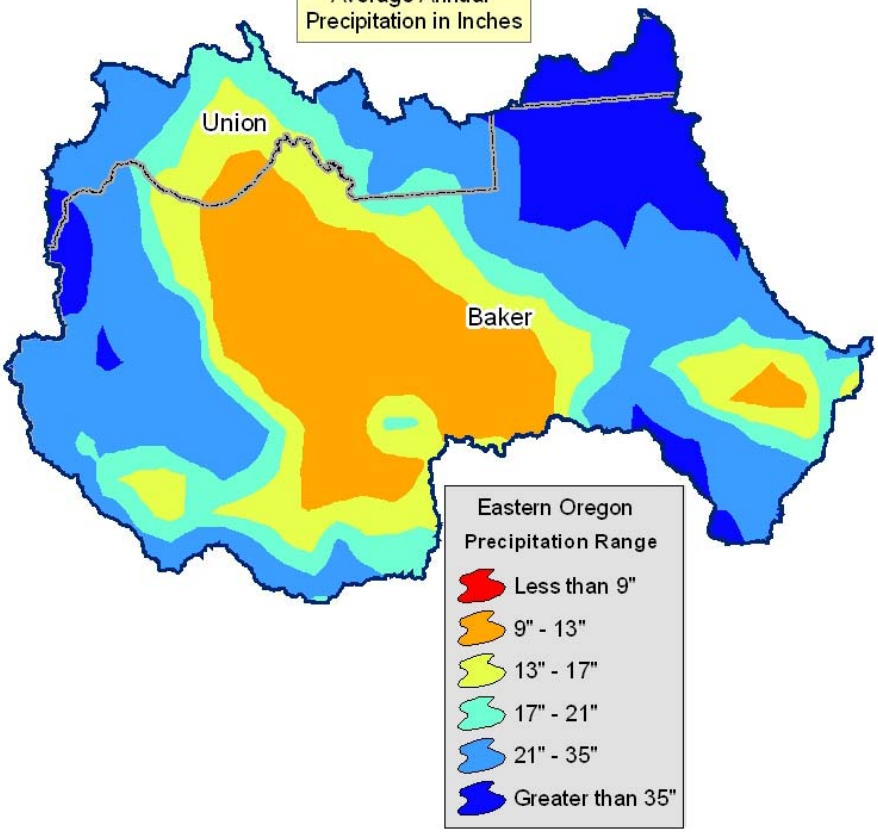
(Continued on the following pages)

Back to Contents

17050203
Land use/Land cover Map



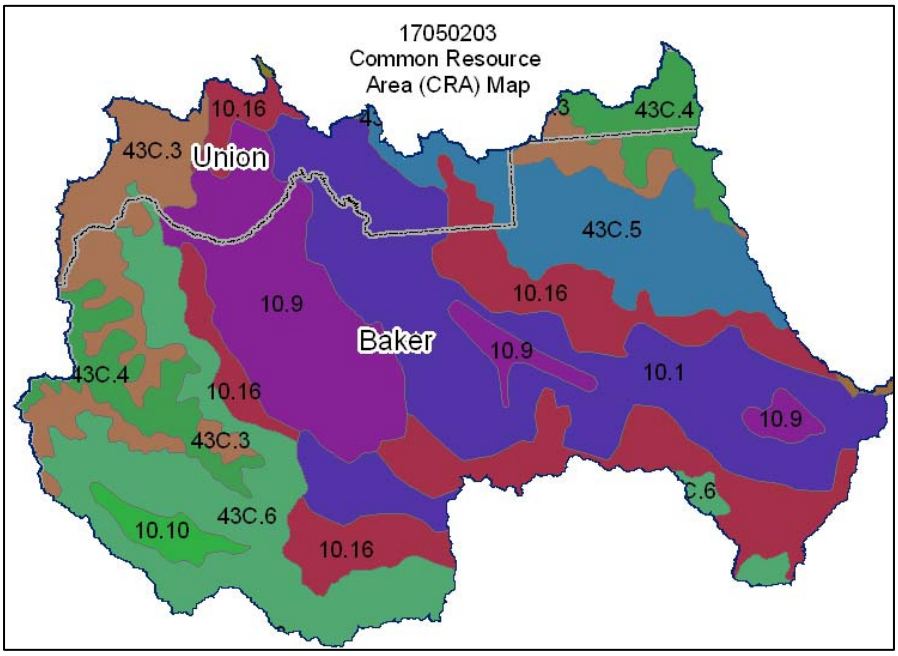
17050203
Average Annual
Precipitation in Inches



Common Resource Area Map

Back to Contents

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 Mountains Foothills - Warm Dry Blue and Seven Devils Mountains Foothills: This unit is between the Blue and Wallowa Mountains in Oregon and the northwestern part of the Snake River Plain. It is characterized by rangeland soils on hills and mountains associated with basalt and exposed tuffaceous sediment. 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 temperature ranges, 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, dry climate).

10.9 – Central Rocky and Blue Mountains Foothills - Blue Mountains Valleys: This unit is characterized by terraces, flood plains, and fans in the Powder River and Burnt River Valleys. The dominant soils are those of the Baker, Wingville, Powder, and Jett series. The temperature regime is mesic, and the moisture regime is aridic. Precipitation is about 9 to 12 inches.

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

43C.6 - Blue and Seven Devils Mountains – Melange: This unit is characterized by a melange of bedrock types, including limestone, mudstone, greenstone, and schist. The temperature regime is frigid or cryic, and moisture regime is xeric or udic. The forests dominantly support Douglas-fir, ponderosa pine, and lodgepole pine. Shrubland and grassland also occur in the unit. Lithology affects soil, vegetation, and the quantity and quality of surficial water. Grazing is common, but logging is limited by the difficulty of reforesting the droughty soils.

43C.3 – Blue and Seven Devils Mountains - High Elevation Blue and Seven Devils Mountains Forests: This unit is characterized by forested plateaus that have cryic temperatures. These areas characteristically have deep snowpack and a very short growing season. The moisture regime is udic. The vegetation is dominantly subalpine fir, Engelmann spruce, and larch. Streams follow fault lines and have steep gradients and eroded, deep canyons. Land uses include grazing, logging, recreation, and wildlife habitat.

Physical Description – Continued

Back to Contents

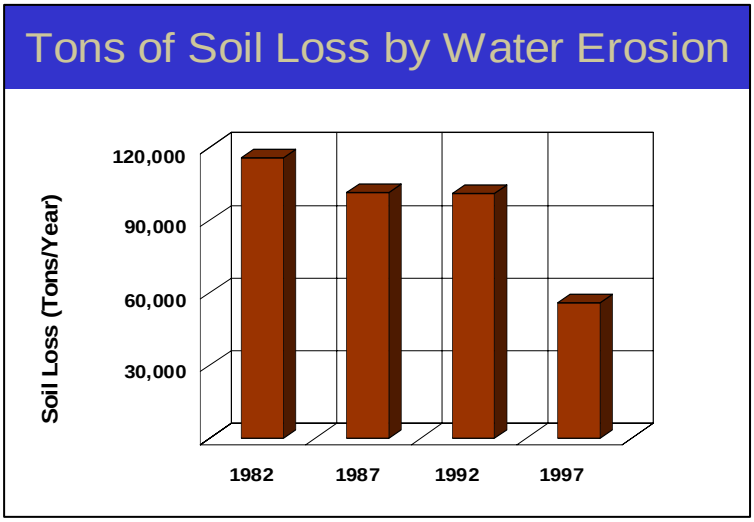
		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights *(OWRD[4])*	Surface	168,685	565,640
	Well	17,112	57,380
	Total Irrigated Adjudicated Water Rights	185,797	623,020
Stream Flow Data	USGS 13286700 POWDER RIVER, NEAR RICHLAND,OR	**Total Avg. Yield**	180,230
		May – Sept. Yield	68,418
		MILES	**PERCENT**
Stream Data[5] **Percent of Total Miles of Streams in HUC*	Total Miles – Major (100K Hydro GIS Layer)	1,668	---
	303d/TMDL Listed Streams (DEQ)	212	13%
	Anadromous Fish Presence (StreamNet)	0	0%
	Bull Trout Presence (StreamNet)	24	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	24,377	37%
	Grain Crops	1,203	2%
	Grass/Pasture/Hay	14,373	21%
	Orchards/Vineyards	0	0%
	Row Crops	5	0%
	Shrub/Rangelands – Includes CRP Lands	24,396	37%
	Water/Wetlands/Developed/Barren	2,138	3%
	Total Acres of 100-Foot Stream Buffers	**66,491**	**---**
Land Capability Class *(Croplands & Pasturelands Only)* *(1997 NRI[3] Estimates for Non-Federal Lands Only)*	**1** – slight limitations	0	0%
	2 – moderate limitations	26,300	19%
	3 – severe limitations	71,900	51%
	4 – very severe limitations	28,900	20%
	5 – no erosion hazard, but other limitations	0	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	13,500	10%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	1,000	1%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	0	0%
	Total Croplands & Pasturelands	**141,600**	**---**

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

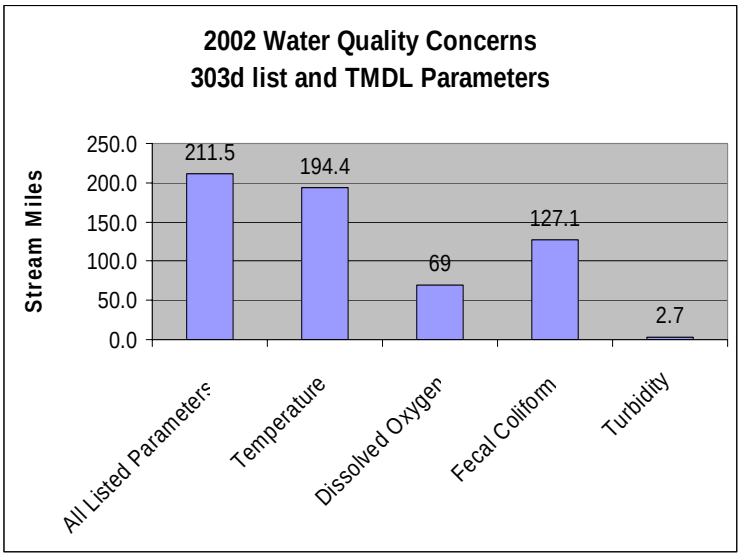
Animal Type	Dairy	Feedlot	Poultry	Swine	Mink	Other
No. of Permitted Farms	3	3	0	0	0	0
No. of Permitted Animals	410	3,900	0	0	0	0

Resource Concerns

Back to Contents



- Sheet and rill erosion by water on the cropland and pastureland have been reduced by nearly 60,000 tons of soil per year from 1982 to 1997.
- NRI estimates indicate that 800 acres 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.
- 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 the cropland and pastureland fell 55 percent, from 0.9 ton/acre/year to 0.4 ton/acre/year from 1982 to 1997.



- Ninety-two percent 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 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**
Wolf Creek North Powder River	Installed 1969 Installed 1969	None	None

ODEQ TMDL's[8]		ODA Agricultural Water Quality Management Plans[9]	
Name	**Status**	**Name**	**Status**
None	None	Powder-Brownlee	Completed

OWEB Watershed Council[10]	Watershed Council Assessments[11]	NWPCC Subbasin Plans and Assessments[18]
Powder Basin Watershed Council	Upper Powder River Watershed Assessment	Powder River

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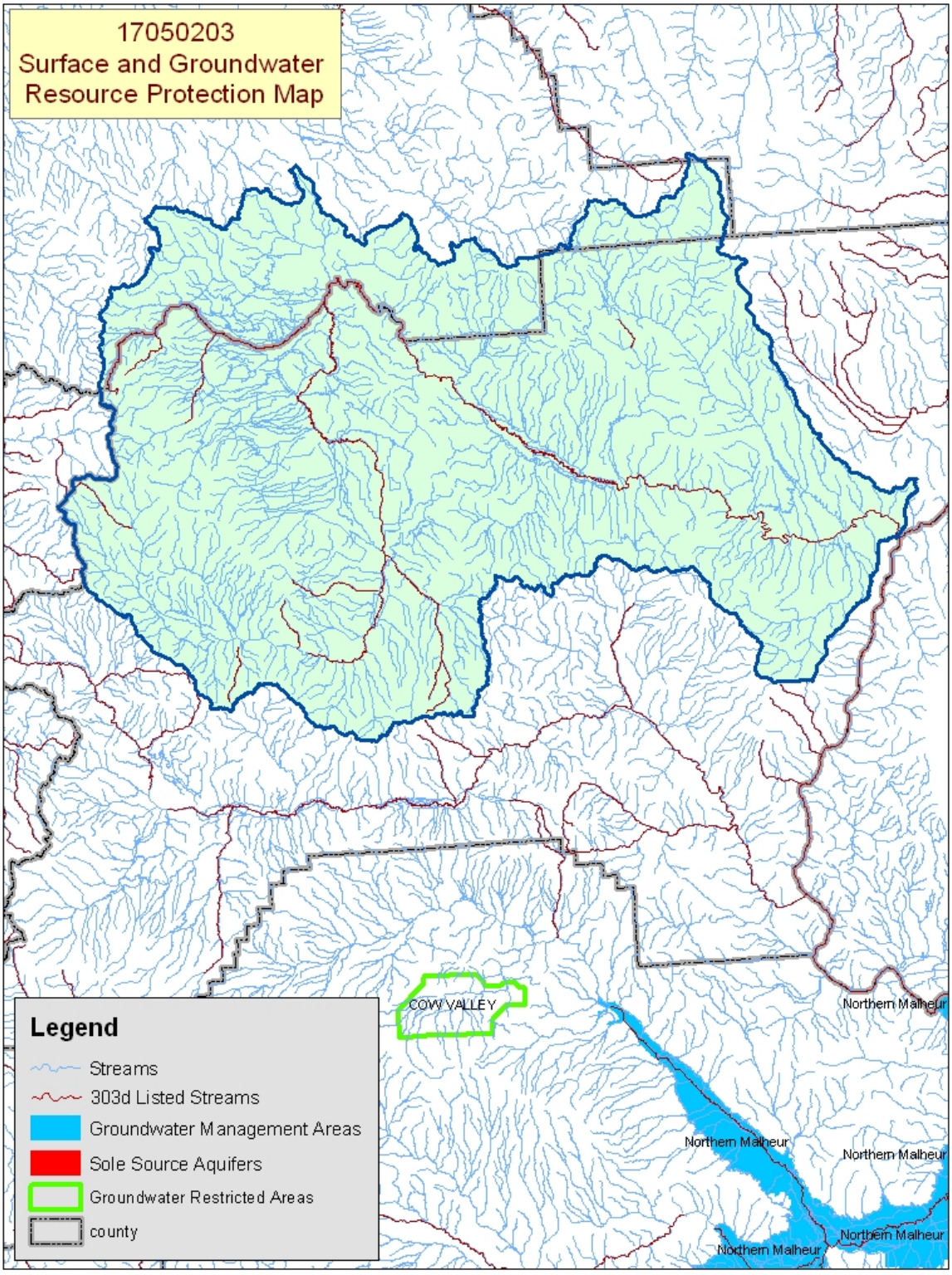


Map Footnote [17]

Resource Concerns - Continued

Back to Contents

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	Streambank	X				X	X
	Irrigation Induced	X	X	X			
Water Quantity	Water Management For Irrigated Land	X	X	X			
	Water Management For Nonirrigated Land					X	
Water Quality, Surface	Suspended Sediments and Turbidity	X	X	X		X	X
	Temperature	X	X	X		X	X
	Aquatic Habitat Suitability	X					
Plant Suitability	Site & Intended Use Suitability	X				X	
	Invasive Weeds	X				X	
Plant Condition	Productivity, Health, and Vigor	X				X	X
Plant Management	Establishment, Growth, and Harvest						X
Animal Habitat, Domestic	Water - Quantity & Quality	X				X	
Animal Habitat, Wildlife	Food, Cover, and/or Shelter					X	X
Human Economics	High Risk and Uncertainty			X			
	High Capital/Financial Costs	X	X	X			
	High Management Level Required			X			
	Low or Unreliable Profitability					X	X
Human, Political	Inadequate Availability of Cost Share Programs	X	X	X		X	X
	Lack of Technical Assistance	X	X			X	X

Pasture / Hay

- Better irrigation water management is practiced in areas used for alfalfa than in areas of pasture.
- In some areas of pasture, a lack of proper grazing management has lead to its poor condition.
- Areas of pasture commonly are adjacent to streams, which can contribute to streambank erosion, sedimentation, and elevated temperatures as a result of loss of riparian vegetation.

Grain and Row Crops

- Most grain is produced in rotation with other crops (potatoes, corn, alfalfa, etc.)
- Irrigation-induced erosion may occur on fields used to produce crops such as potatoes or corn.
- Surface-irrigated areas of grain are also prone to irrigation-induced erosion.
- Water management is always a concern with irrigated crops, but irrigation water management is better in areas used for row crops and alfalfa than it is in areas used as pasture.

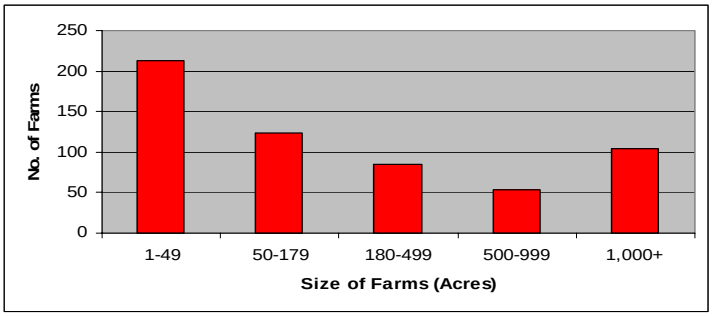
Rangeland / Forestland

- Rangeland can become infested with noxious weeds, annual grasses, and shrubs because of inadequate forage and grazing management.
- Loss of riparian vegetation contributes to the warming and nutrient-loading of streams.
- About 30 percent of the private forestland is managed by private industrial owners, who generally comply with State forest practice requirements.
- Private non-industrial forestland commonly is associated with grazed woodland; it is not managed primarily for timber production.
- Private forests are subject to damage from insects and disease, overstocking, and fuel buildup. Thinning is needed to increase productivity and reduce the risk of catastrophic fire.
- High cost, unreliable markets, and inadequate incentive programs limit forestland management activities.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES[12]	
THREATENED SPECIES	**CANDIDATE SPECIES**
Mammals-Canada lynx **Birds –** Bald eagle **Fish –** Bull trout **Plants –** Howell's spectacular thelypody	**Birds –** Yellow-billed cuckoo **Amphibians and Reptiles –** Columbia spotted frog **Plants-** Slender moonwort
	PROPOSED SPECIES None
ESSENTIAL FISH HABITAT[13] - None	

Census and Social Data[/14]

Back to Contents



Number of Farms: 579

Number of Operators: 957

- Full-Time Operators: **316**
- Part-Time Operators: **641**

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

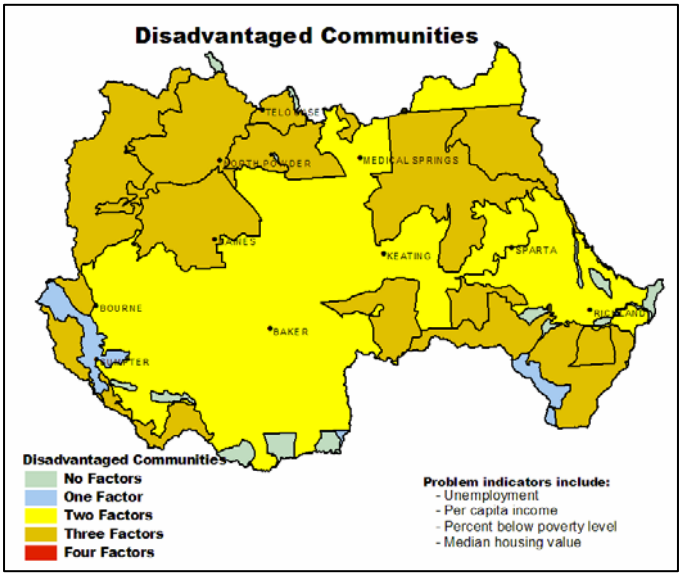
Most operators in the Powder River subbasin are full-time ranchers, well educated, and aware of local resource concerns; have already adopted some conservation practices; seek out conservation information; and have a positive stewardship attitude. While they tend to perceive a positive effect of conservation on local resource concerns, they also perceive the cost of conservation to be prohibitively high. Adequate financial assistance and timely technical assistance are problems. Many ranchers perceive government regulations threaten their ability to autonomously manage the resources on their land.

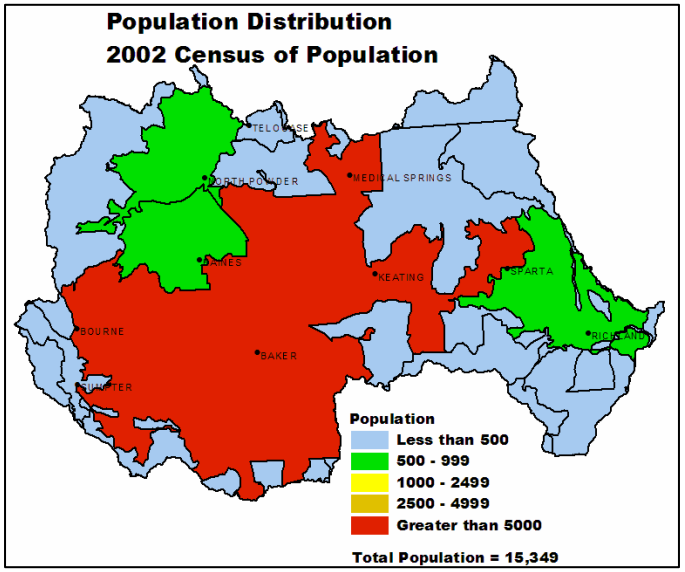
Additional financial incentives and other risk-reducing incentives would increase the adoption of conservation in the subbasin as would the availability of *timely* technical assistance.

Evaluation of Social Capital[/16]: Moderate to High

Social capital and the ability of the community to solve problems and support conservation are estimated to be moderate throughout most of the subbasin; they are somewhat higher near towns and rural community centers. Because the subbasin is a remote area far from government and business decision-making centers and has only a small population, it is difficult for members of these communities to effect change regionally or statewide. On the other hand, local communities commonly are quite active with schools and churches and in agricultural activities. Most residents are ranchers who know and support one another. Most of the community participates in activities and issues that they believe will affect their families and livelihoods.

As conservation becomes more important to the members of the communities in the Powder River subbasin, the diffusion of conservation throughout the subbasin will increase.

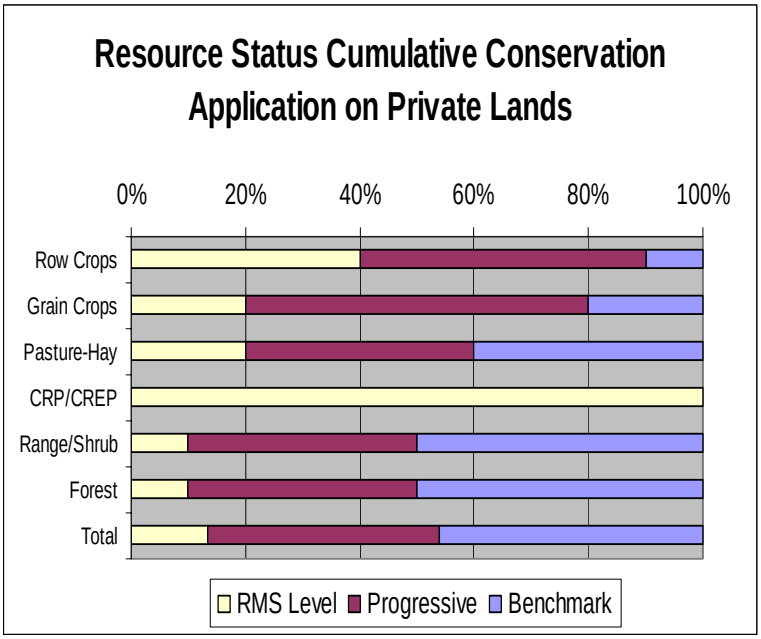




Progress/Status

Back to Contents

PRMS Data	FY99	FY00	FY01	FY02	FY03	Avg/Year	Total
Total Conservation Systems Planned (Acres)	8,973	20,291	12,334	10,416	2,209	10,845	54,223
Total Conservation Systems Applied (Acres)	1,395	13,918	114	2,318	3,822	4,313	21,567
Conservation Treatment (Acres)							
Waste Management	0	0	0	0	0	0	0
Buffers	0	49	177	601	228	211	1,055
Erosion Control	0	0	0	6	74	16	80
Irrigation Water Management	211	29	2,831	3,282	2,045	1,680	8,398
Nutrient Management	0	0	0	0	0	0	0
Pest Management	10	0	0	216	0	45	226
Prescribed Grazing	5,952	0	0	2,779	1,529	2,052	10,260
Trees & Shrubs	0	4	10	66	107	37	187
Conservation Tillage	0	0	0	0	0	0	0
Wildlife Habitat	1,195	794	1,453	885	637	993	4,964
Wetlands	0	0	533	300	109	188	942



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

- Progress over the last 5 years has been focused on:
  - Erosion control and irrigation water management in areas of grain and row crops.
  - Prescribed grazing on grazing land.
  - Wildlife habitat management, including use of buffers, trees, shrubs in riparian areas (CREP) and on uplands (CRP).
- Most grain producers practice conservation cropping and residue management.
- Most producers of row crops and hay practice irrigation water management; however, grazing and water management commonly is inadequate on pastures.
- Most private industrial timber owners are doing good conservation work and are satisfying State forest practice requirements.
- Most private non-industrial woodlots are associated with forest grazing allotments that are not primarily managed for timber production.

Lands Removed from Production through Farm Bill Programs

- Conservation Reserve Program (CRP): **1,376 acres**
- Wetland Restoration Program (WRP): **858 acres**
- Conservation Reserve Enhancement Program (CREP): **117 acres**

Footnotes/Bibliography

Back to Contents

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

Back to Contents

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.