

Lower Grande Ronde Watershed

HUC: 17060106

Rapid Watershed Assessment



This assessment involves the collection of quantitative and qualitative information to develop a watershed profile, sufficient analysis of that information to make qualitative statements as to resource concerns and conditions, and the generation of information with which to make decisions about conservation needs and recommendations. These assessments are conducted through the use of Geographic Information System (GIS) technology and by conservation planning teams working within the watershed, meeting with landowners and conservation groups, inventorying agricultural areas, assessing current levels of resource management, identifying conservation recommendations and, making qualitative estimates of the impacts of conservation on local resource concerns.

November 1, 2006

The majority of the Lower Grande Ronde watershed is located in Oregon. Only approximately 23% of total base acres are located in Washington.

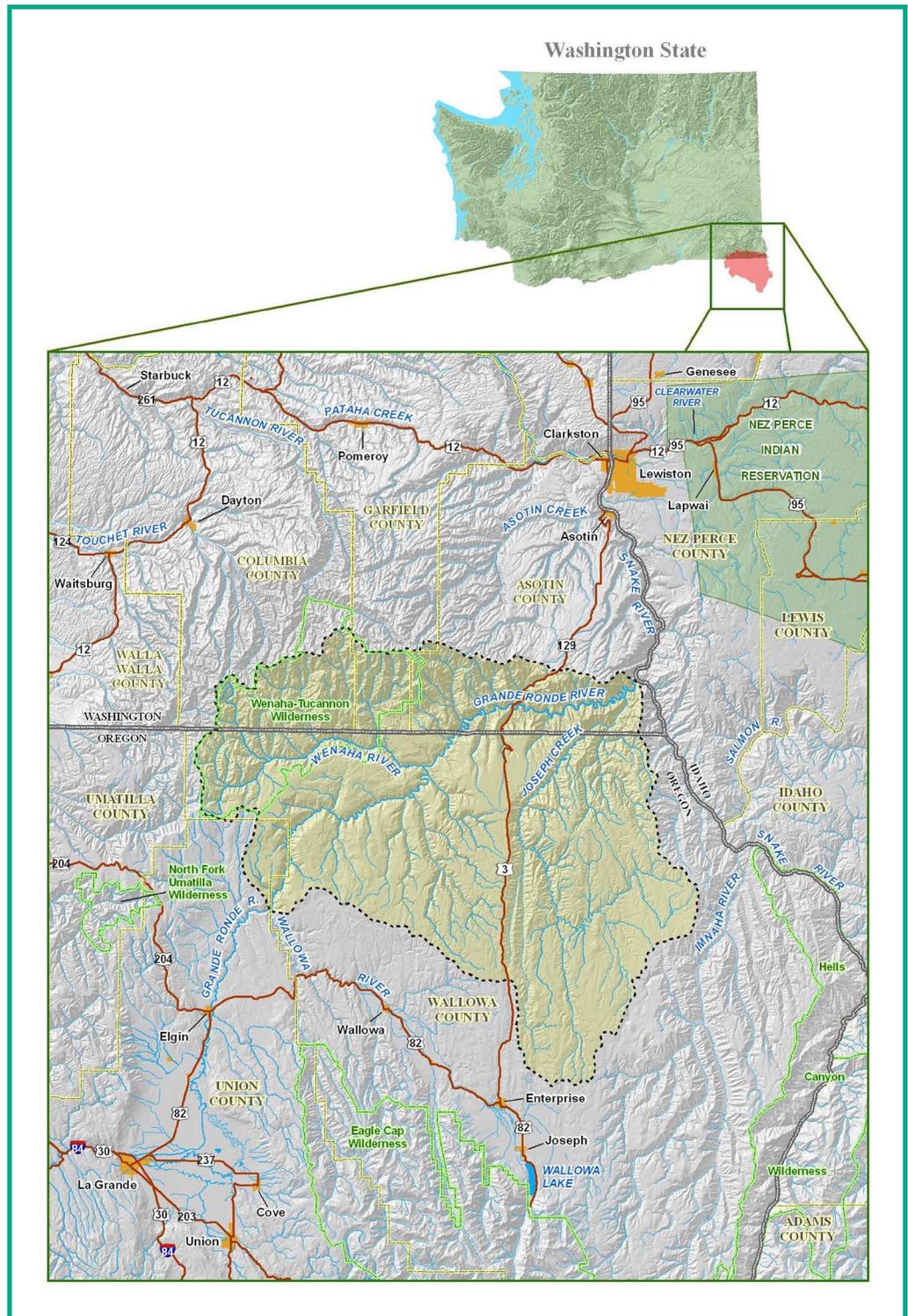
The Washington State portion of the Lower Grande Ronde is 221,413 acres in size. The watershed is 32% privately owned and 68% publicly owned.

The majority of the watershed is forest and range. Cropland and hayland is located in the narrow river floodplain areas. Agricultural enterprises include cow-calf operations, hay and pasture (both irrigated and dryland) and some commercial forest management on non-industrial private forestland.

There are no incorporated cities or built-up areas in the watershed. The population is scattered and located on ranches and rural tracts.

Major resource concerns are streambank erosion, impaired water quality, forest health issues, invasive weeds, and poor range condition.

Primary natural resource technical assistance is provided by the Clarkston NRCS Field Office, Asotin Conservation District, and the Blue Mountain Resource Conservation and Development Area.



The profile content for the Rapid Watershed Assessments in Washington is outlined in the following five categories:

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The soils in the higher elevations of the watershed are dominated by surface layers of Mazama volcanic ash over clay enriched loess or basalt derived ancient soils in the forested parts of the watershed. The soils have surface textures of ashy silt loams, stony ashy silt loams and ashy loams. The soils on the lower elevation hills are shallow to deep soils formed in residuum, colluvium, and alluvium from basalt with loess and have surface textures of loams, silt loams, cobbly loams, very stony loams, and stony silt loams. The climate pattern in this watershed provides a low risk of wind erosion although the soils are susceptible to wind and water erosion when surface residue is removed by wildfire or intensive crop/forest management practices.

B4 - Stony rangeland and cropland soils; shallow to deep; these soils have dark-colored, humus-rich topsoils. Xeric/Mesic; Goldendale-Laufer-Clint.

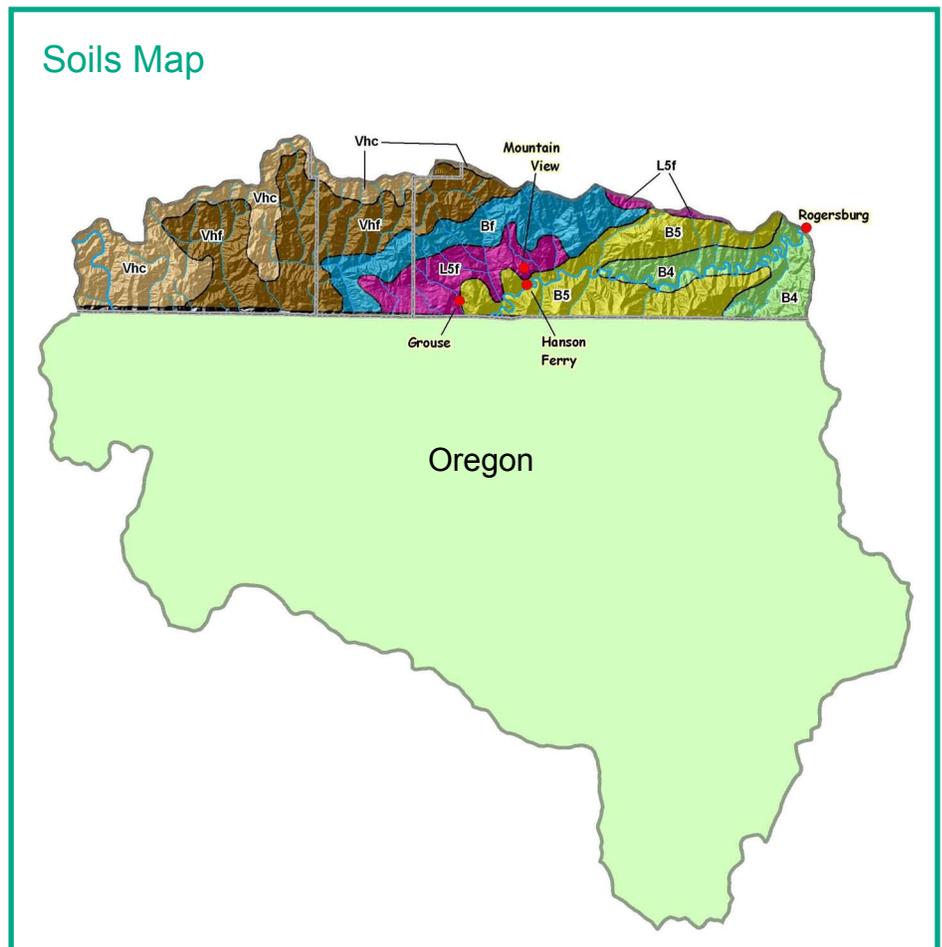
B5 - Stony rangeland soils; shallow to deep; some soils formed under scattered Oregon white oak or ponderosa pine; most have very dark, humus-rich topsoils. Xeric/Mesic; Gwinly-Teakison-Lyville-Mallory-Anatone-Leidl.

Bf - Cool, stony forest soils; transitional between B5 and Vf or Vhf. Xeric/Frigid to Mesic; Loneridge-Jumpe-Berson-Para-McGowan-Gunn-Sutkin.

L5f - Fine-silty, somewhat cool loessial soils that have clay-enriched subsoils; these soils in old, deeply-weathered loess; those formed under conifers have light-colored topsoils; those formed under steppe vegetation have dark-colored, humus-rich topsoils. Xeric/Mesic to Frigid; Freeman-Larkin-Naff-Dearyton-Cloverland-Teaway.

Vhc - Cool and cold, deep forest soils that formed in volcanic ash over clay enriched loess-derived or basalt-derived ancient soils. Udic/Cryic; Helter.

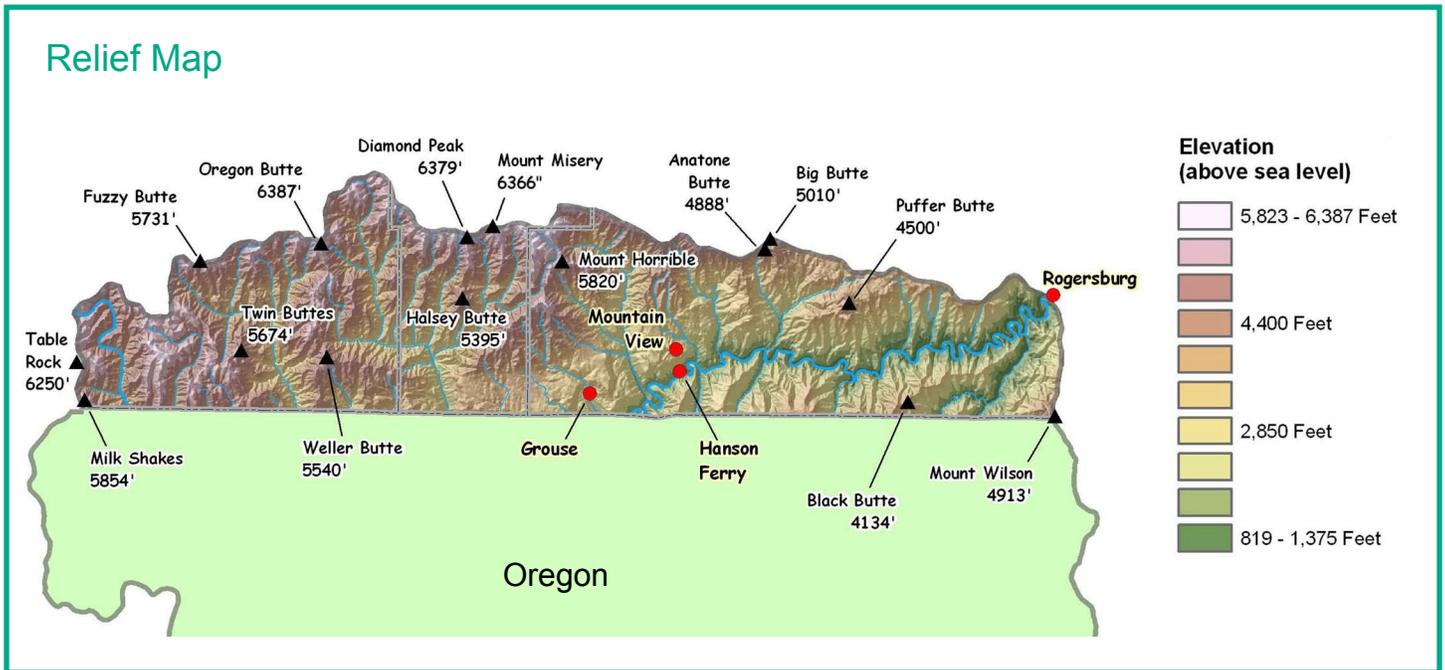
Vhf - Cool and cold, deep forest soils that formed in volcanic ash over clay enriched loess-derived or basalt-derived ancient soils. Xeric/Frigid; Tolo-Olot-Cracker creek.

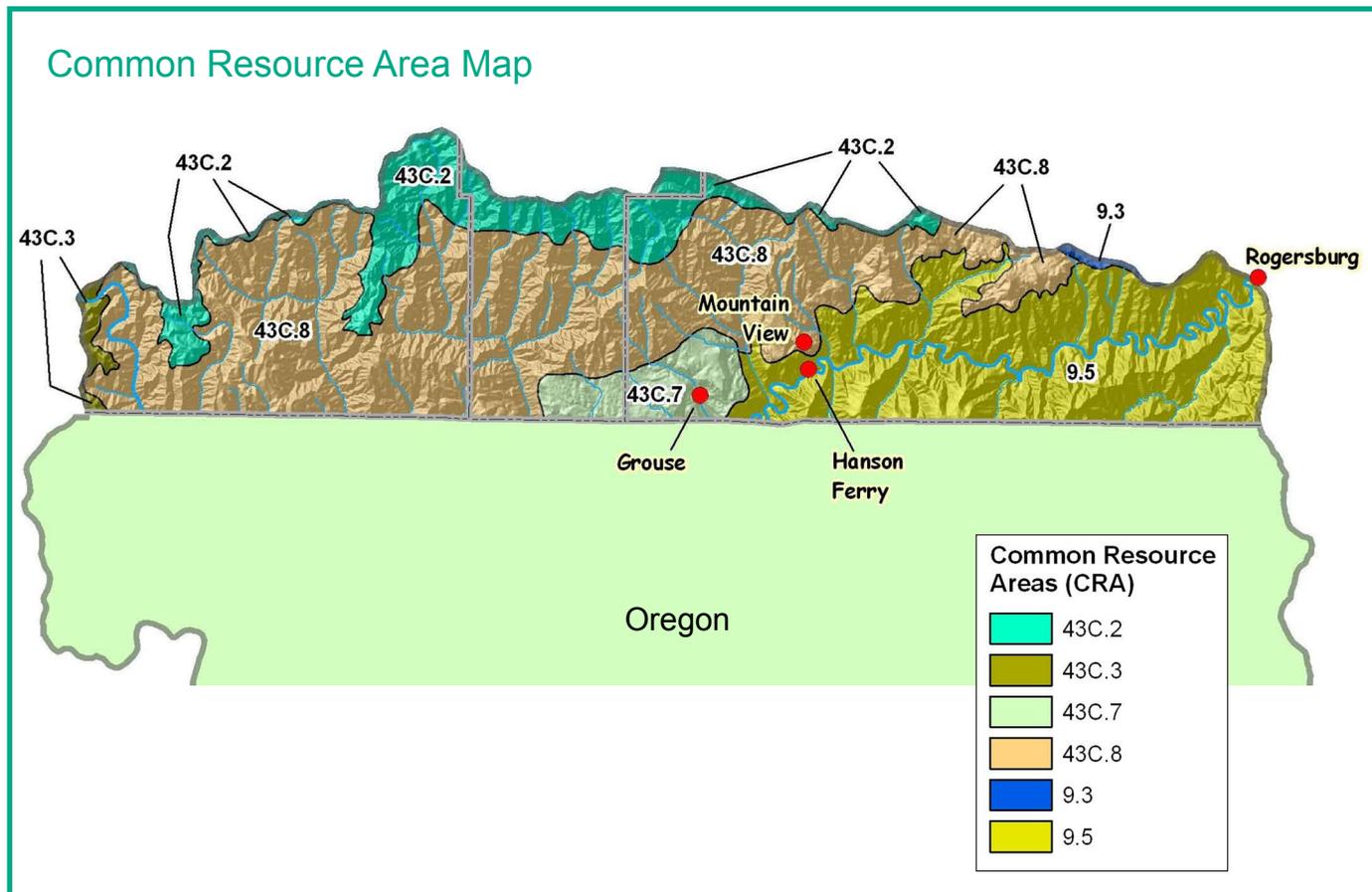


Physical Descriptions

Relief ³ and Precipitation ⁴

Lower Grande Ronde
 967,923 Total Acres
 HUC# 17060106





43C.2 - Blue and Seven Devils Mountains - Maritime-Influenced Zone. This unit is that part of the Blue Mountains that directly intercepts marine weather systems moving east through the Columbia River Gorge. Rain or snow events occur except in the summer. Loess soils are found at lower elevations near the Columbia Plateau and have a moderately high water holding capacity. Moisture availability is sufficient to support forests at lower elevations than elsewhere in the Blue Mountains. A dry forest of ponderosa pine and Douglas fir occurs and has a dense and diverse shrub layer.

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

(Common Resource Area narrative continued on next page.)



43C.7 - Blue and Seven Devils Mountains - Low Elevation Blue Mountain Forests. This unit is a forested, uplifted basalt plateau. This unit is characterized by forested plateaus having frigid temperatures and highly dissected canyons. Slopes are nearly level to rolling except very steep in the canyons. Moisture regime is xeric and udic. Vegetation is dominated by grand fir, Douglas-fir and ponderosa pine. The soils in this unit typically have an ash mantle up to 20 to 30 inches thick.

43C.8 - Blue and Seven Devils Mountains - Blue and Seven Devils Mountains Dissected Uplands. This unit is characterized by deeply dissected forested mountain slopes. Temperature regime is frigid and the moisture regime is xeric. Vegetation is grand fir, Douglas-fir and ponderosa pine. The soils on the north facing slopes retain an ash mantle but south facing slopes lack this mantle due to erosion. Below about 4,500 feet elevation, the Douglas fir forest changes abruptly to the grassland of the Warm Canyons and Dissected Uplands CRA.

9.3 - Palouse and Nez Perce Prairies - Dissected Loess Uplands. This unit is located on the northeastern slopes of the Blue Mountains. It comprises non-forested, rolling loess hills, canyons, and flat plateau remnants isolated by the lower canyons of the Snake River (CRA 8.6). Grasslands without a sagebrush component dominate the lower elevations. Shrubs (rose and snowberry) appear with increasing moisture at higher elevations. Though grazing and farming have eliminated much of the original plant cover, the dissected terrain and thinner soil is not as suited to agriculture as the neighboring Palouse Hills and Deep Loess Foothills CRAs. Small grain, pea, and hay farming, grazing, and wildlife habitat.

9.5 - Palouse and Nez Perce Prairies - Warm Canyons and Dissected Uplands. This unit is characterized by deep river canyons that divide the Blue Mountains from the Rocky Mountains. The Snake, Salmon, and Grande Ronde Rivers and their tributaries have cut the Columbia Plateau to depths of 2,000 to 5,000 feet through metasedimentary and metavolcanic rock. Canyon depth and the exposed metamorphic rocks result in stony soils on canyon slopes that retain little moisture. The dominant soils are Dixiejett and Lickskillet soil series. Temperature regime is mesic and the moisture regime is xeric and aridic. Mean annual precipitation is 12 to 16 inches. Bluebunch wheatgrass, Sandberg's bluegrass, and spiny greenbush are adapted to these hot, dry conditions. Land use includes grazing and recreation on National Forest lands and in the Hells Canyon National Recreation Area.

Physical Descriptions

Land Use / Land Cover ⁵

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Landuse is a term used for a designation of a land area. NRCS uses official designations, based on use, such as cropland, forestland and pastureland. The Lower Grand Ronde watershed map shows the primary landuse designations; Evergreen Forest, Deciduous Forest, Mixed Forest, Grasslands/Herbaceous and Shrubland. These 5 major landuses make up 97% of the watershed. Minor landuses are displayed in the table.



Land Use / Land Cover Map



Land Use/Land Cover features in the Watershed

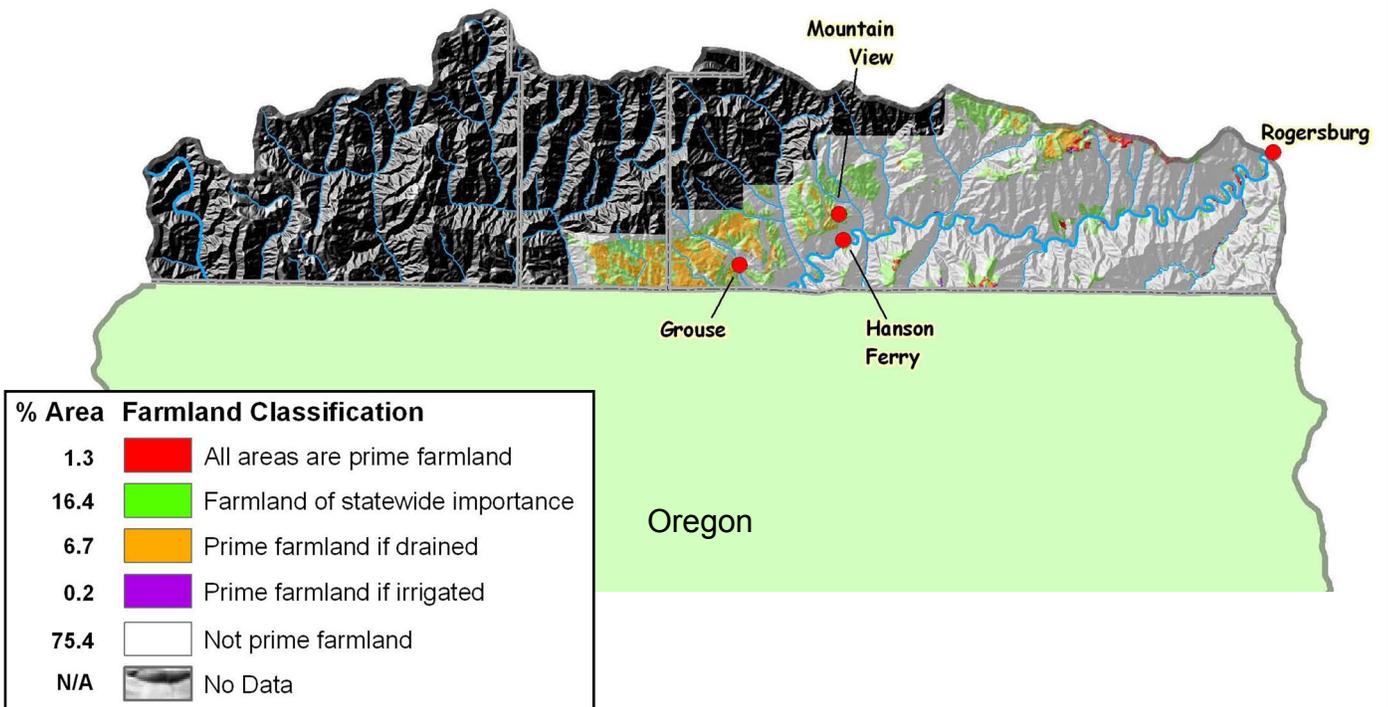
Land Use/Land Cover	Acres	% Area	Land Use/Land Cover	Acres	% Area
Evergreen Forest	88,167.68	39.82	Bare Rock/Sand/Clay	657.52	0.30
Shrubland	85,703.91	38.71	Transitional*	410.23	0.19
Grasslands/Herbaceous	28,538.71	12.71	Low Intensity Residential	40.23	0.02
Mixed Forest	7,985.11	3.61	Woody Wetlands	26.22	0.01
Deciduous Forest	5,097.88	2.30	Emergent Herbaceous Wetlands	3.11	0.00
Cropland*	3,711.73	1.68	Commercial/Industrial/Transport	1.03	0.00
Open Water	1,063.45	0.48	Urban/Recreational Grasses	0.22	0.00

Certain Land Use/Land Cover features cannot be seen on the map at this scale.

Ownership Map



Farm Classification Map



Physical Descriptions

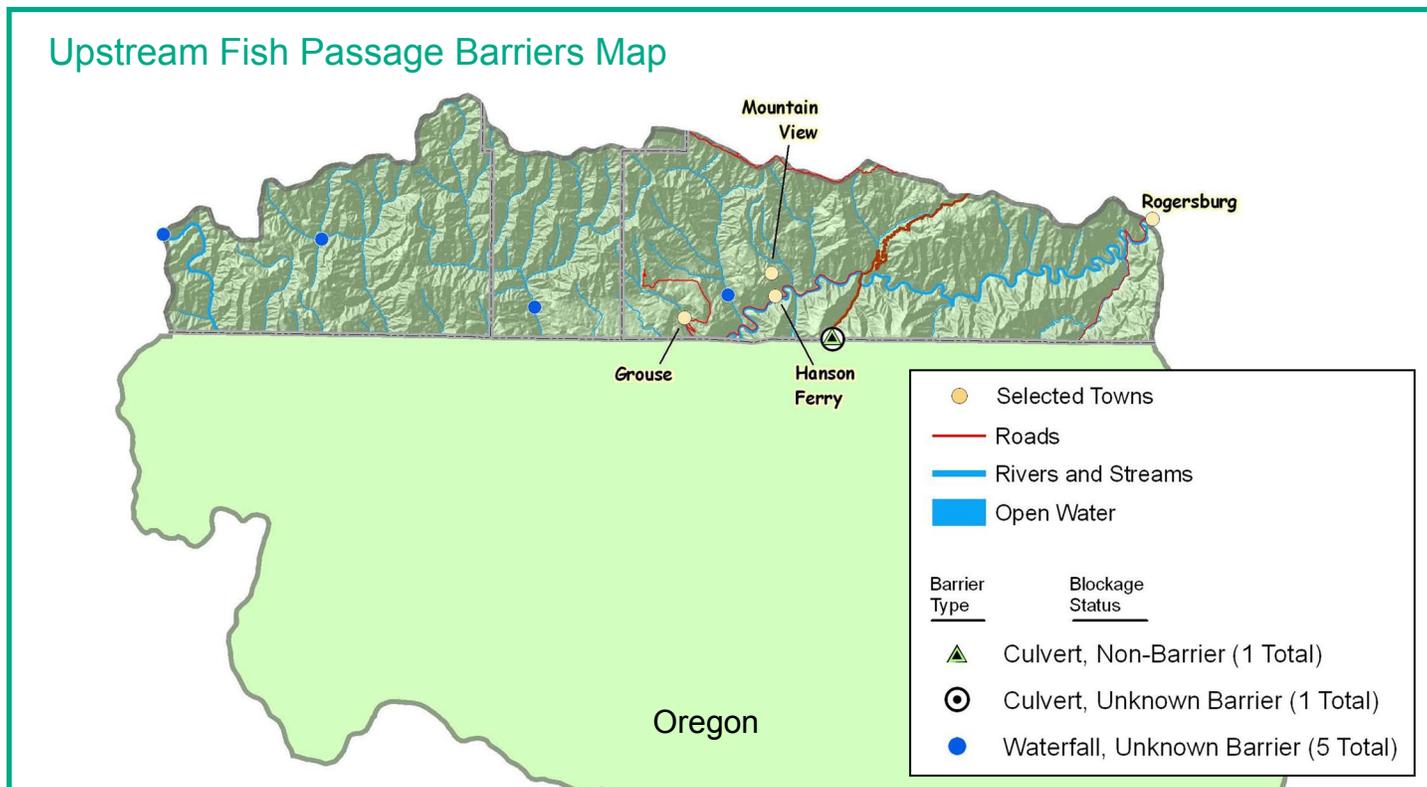
Streams, Fish Species and Passage Barriers 7,8,9,18,19

Lower Grande Ronde

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Statewide - these fish groups are exotic (introduced): catfish, spiny-rays (perch, sunfish, bass), pike, shad, mosquitofish, killifish, weatherfish, striped bass and goby.



Fish Species Found in the Lower Grande Ronde Watershed		
Fish Group	Native	Exotic
Catfish		3
Lamprey	2	
Minnow, carp	7	1
Perch, walleye		1
Salmonid (anadromous)	4	
Salmonid (resident)	3	
Sand roller	1	
Sculpin	1	
Sturgeon	1	
Sucker	3	
Sunfish, bass, crappie		6
Watershed Total	22	11
Statewide Total	53	41

Stream Statistics for the Lower Grande Ronde Watershed	
Total streams	533
Named streams	223
Total stream miles	1704
Intermittent miles	832
Intermittent %	49%

Lower Grande Ronde Watershed –
Salmonid (anadromous) native: Chinook, coho, sockeye salmon; steelhead.
Salmonid (resident) native: rainbow, bull, westslope cutthroat trout, mountain whitefish.

Note: Lower Grande Ronde fish distribution is assumed to be the same as the Snake River, into which it flows.

Physical Descriptions

303d Listed Surface Water ^{12,13}

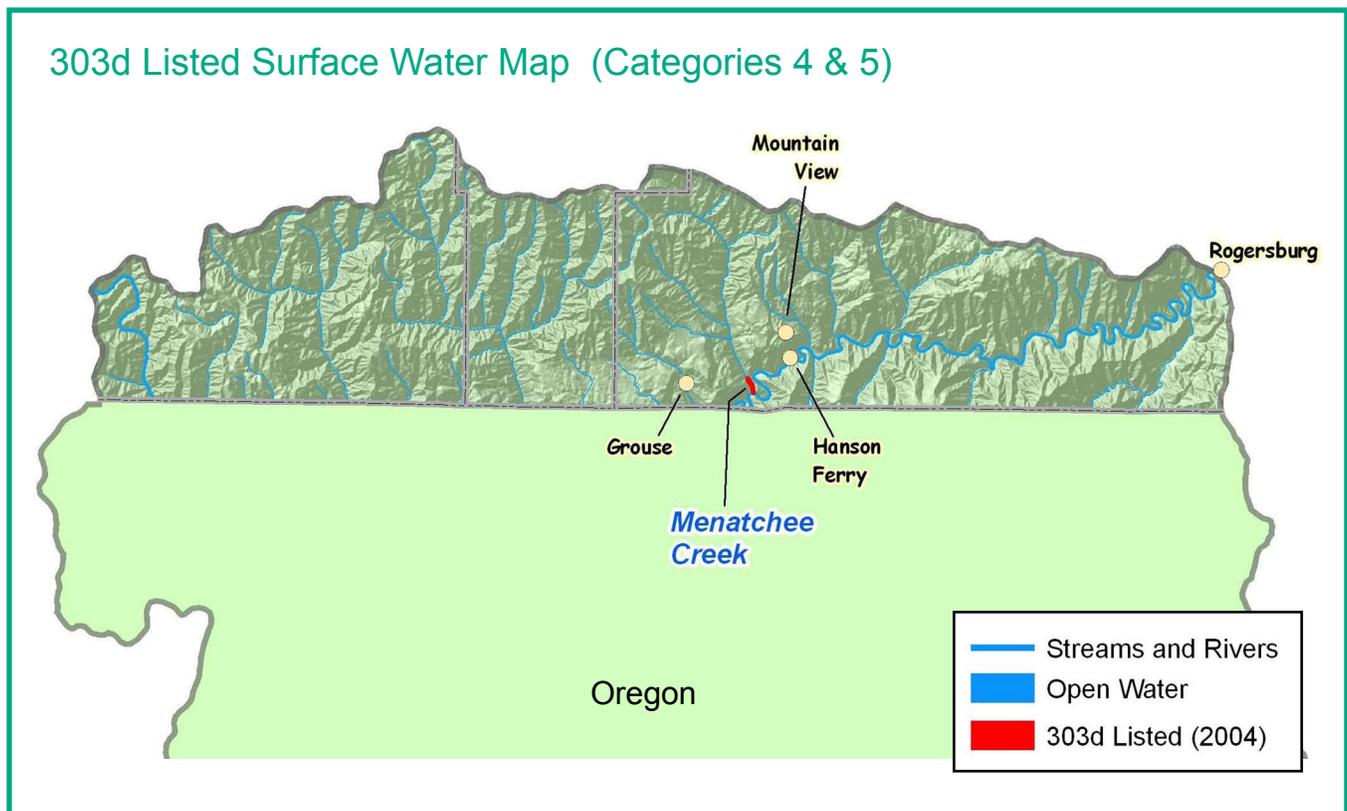
Lower Grande Ronde
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Section 303(d) of the federal Clean Water Act requires each state periodically to prepare a list of all surface waters in the state for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. These are water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards and are not expected to improve within the next two years.

Waters placed on the 303(d) list require the preparation of Total Maximum Daily Loads (TMDLs), a key tool in the work to clean up polluted waters. TMDLs identify the maximum amount of a pollutant that can be released into a waterbody without impairing the uses of the water. TMDL's can be allocated amount among various pollution sources. In addition, even before a TMDL is completed, the inclusion of a water body on the 303(d) list can reduce the amount of pollutants allowed to be released under permits issued by Ecology.

Washington State's Water Quality Assessment lists the status of water quality for a particular location in one of 5 categories recommended by EPA. Categories 1 – 4 represent the status of waters for the 305(b) Report, while Category 5 represents those waters placed on the 303(d) list.



(303d narrative continued on next page.)

Physical Descriptions

303d Listed Surface Water

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Category 4: Polluted waters that do not require a TMDL is for waters that have pollution problems that are being solved in one of three ways.

Category 4a: **“has a TMDL”** is for water bodies that have an approved TMDL in place and are actively being implemented.

Category 4b: **“has a pollution control plan”** is for water bodies that have a plan in place that is expected to solve the pollution problems. While pollution control plans are not TMDLs, they must have many of the same features and there must be some legal or financial guarantee that they will be implemented.

Category 4c: **“is impaired by a non-pollutant”** is for water bodies impaired by causes that cannot be addressed through a TMDL. These impairments include low water flow, stream channelization, and dams. These problems require complex solutions to help restore streams to more natural conditions.

Category 5: Polluted waters that require a TMDL. The 303(d) list is the traditional list of impaired water bodies. Placement in this category means that Washington State Department of Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. TMDLs are required for the water bodies in this category.

Water Body	Fecal Coliform	Temp	Dissolved Oxygen	pH	Total Phosphorus	Ammonia-N	Total PCBs	Mercury	In-stream Flow	Fish Habitat
Menatchee Creek		X								

Physical Descriptions

Riparian Land Use / Land Cover ⁵

Lower Grande Ronde
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The current condition and quality of riparian areas adjacent to water bodies is often times dependent on the land use and land cover characteristics.



This data set is based on a riparian width of 100 feet on each side of all streams in the watershed.

Land Cover/Use		
Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer	ACRES	% of Buffer Area
Bare Rock/Sand/Clay	10.7	0.1%
Commercial/Industrial/Transportation	0.2	0.0%
Deciduous Forest	673.0	5.8%
Emergent Herbaceous	0.4	0.0%
Evergreen Forest	5,759.9	49.6%
Fallow	2.0	0.0%
Grasslands/Herbaceous	1,410.3	12.1%
Low Intensity Residential	2.0	0.0%
Mixed Forest	664.0	5.7%
Open Water	686.5	5.9%
Shrubland	2,254.0	19.4%
Small Grains	129.6	1.1%
Transitional	10.9	0.1%
Woody Wetlands	12.0	0.1%
Grand Total	11,615.5	100.0%

Physical Descriptions

Irrigated Cropland, Hayland and Pastureland ¹⁴

Lower Grande Ronde

967,923 Total Acres

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The Natural Resource Inventory (NRI) of 1997 was used to estimate acres of irrigated and cultivated cropland, uncultivated cropland (hayland) and pastureland in the watershed.



These estimates were then verified by the Asotin office staffs.

Irrigated Lands <i>(1997 NRI ³ Estimates for Non-Federal Lands Only)</i>			
Type of Land	ACRES	Percent of Irrigated Lands	Percent of HUC
Cultivated Cropland	0		0%
Uncultivated Cropland	0		0%
Pastureland	0		0%
Total Irrigated Lands	0		0%

Animal Feeding Operations					
Animal Type	Dairy	Beef Feedlot	Heifer Feedlot	Poultry	Swine
				(Egg & Fryer)	
No. of Farms	0	6	0	0	0



Cultural resources are important to most residents in the watershed. Cultural Resources are considered equivalent to “historic properties” as defined in the National Historic Preservation Act. They include any prehistoric or historic district, site, building, structure or object listed in or eligible for listing in the National Register of Historic Places (maintained by the Secretary of the Interior). They also include all records, artifacts and physical remains associated with the historic properties. They may consist of the traces of all of the past activities and accomplishments of people.

Cultural resources that are also protected under other authorities (such as the American Indian Religious Freedom Act) include:

- (1) tangible traces such as districts, sites, buildings, structures and objects;
- (2) less tangible traces such as dance forms, aspects of folk life, landscapes, vistas, cultural or religious practices;
- (3) historical documents;
- (4) and some landscapes, vistas, cemeteries (if they have historic or cultural value) and life ways.

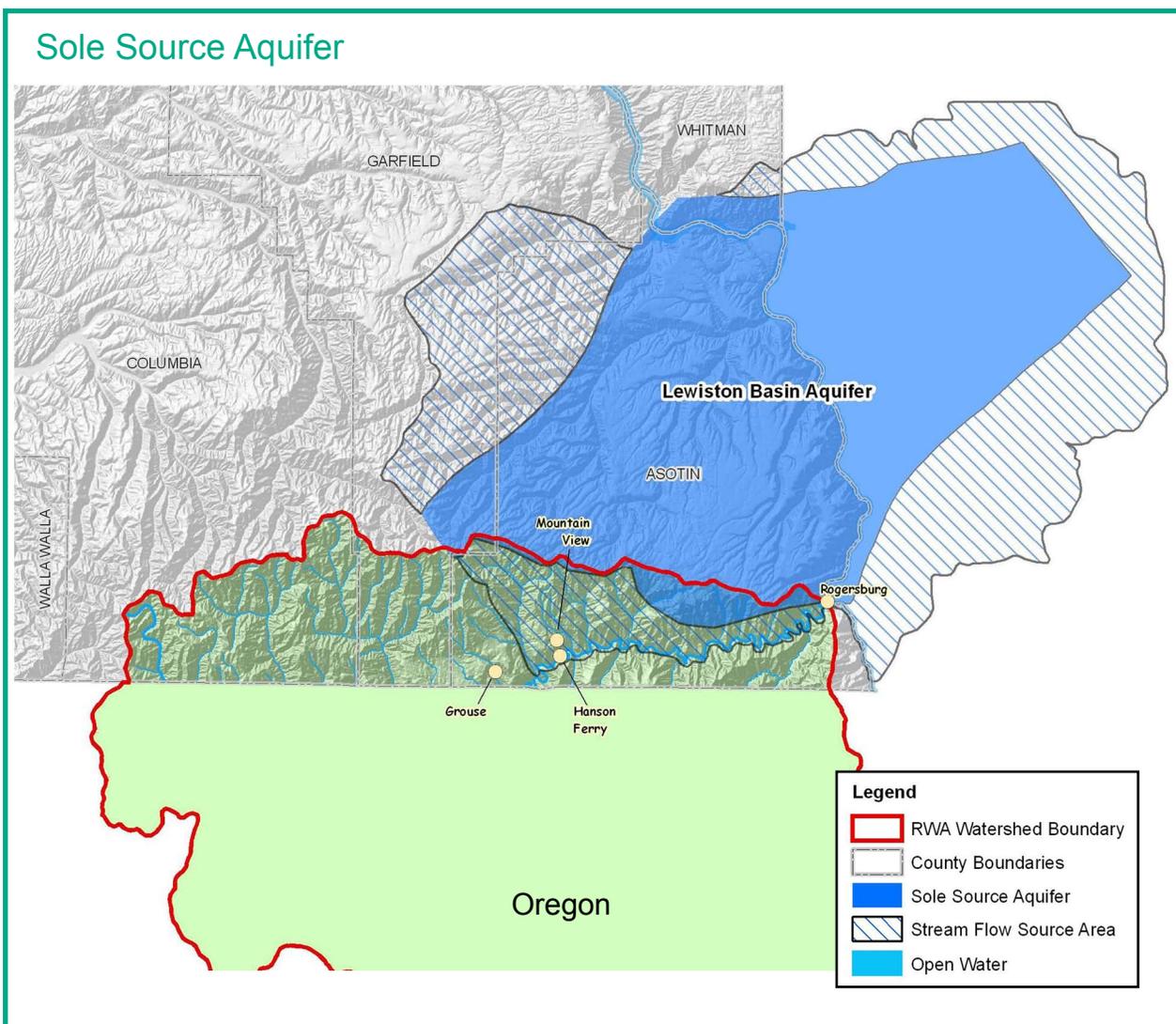
Native Americans have fished and used the resources in the watershed for thousands of years. Native Americans from the Cayuse, Umatilla, Walla Walla, and Nez Perce tribes lived in the watershed. These tribes continue to hold treaty rights to harvest fish, wildlife and plants at usual and accustomed places.

An activity carried out in the watershed by Federal agencies, where the agency has control of the outcome, is subject to provisions of the National Historic and Preservation Act. The Act requires Federal agencies to take into account the effects of their undertakings on any cultural resources or historic properties that meet the National Register of Historic Places criteria. Part of this process involves taking action to avoid or minimize harm to eligible resources.

The Northeastern part of the Lower Grande Ronde watershed lies above the Lewiston Basin Aquifer that has been designated as a sole source aquifer (SSA). Under the Federal Safe Drinking Water Act, the EPA may determine that an underground water supply is the sole or principal source of drinking water for an area which, "if contaminated, would create a significant hazard to public health...". Designation may come from the EPA administrator's own initiative or by a petition by any person, including individuals, corporations, municipalities, associations, or agencies.



Definition of a SSA includes: The aquifer must be the sole or principle source of drinking water for residents within the aquifer boundary. No feasible alternatives can replace the drinking water supplied by the aquifer should it become contaminated. The aquifer boundaries must be clearly definable. Once EPA designates an aquifer as a Sole Source Aquifer, monetary limits may be placed on "federal financial assistance" for projects that could contaminate drinking water.



Resource Concerns

Resource Concerns

Lower Grande Ronde
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The Local Work Group (LWG) has identified the following resource concerns as being the top priority for cost share assistance:



SOIL
CI > 16 and the RKLS <=25 on cropland.
Minimum tillage (herbicides and tillage) or a delayed minimum tillage (herbicides and delayed tillage) system of management on summer fallow in the less than 12 precipitation zone.
Native or introduced forage species be established on HEL cropland.
RKLS on cropland > 25 and CI <=16 on cropland.
Vegetation be managed without soil disturbance from harvest of the previous crop until seeding of the crop following the fallow season in the 12 and greater precipitation zone.
WATER
Forest road is delivering sediment directly or indirectly to salmonid-bearing streams.
Irrigation water management
Livestock water is a limiting factor for achieving proper grazing distribution.
Noxious weeds and/or woody vegetation.
Nutrient/Pest Management Systems utilizing GIS Guidance/Mapping.
Pest Management System utilizing automated spot spraying.
Riparian Forest Buffer, Grass Buffer Strip, Shelterbelt, Grassed Waterway, Field Border, or Filter Strip.
Uncontrolled livestock access to riparian areas.
Winter feeding areas adjacent to streams.
AIR
Field Windbreak.
Land located within the Conservation Priority Area identified on the CRP Air Quality Map (2-CRP, WA Exhibit 12).
PLANT
Decline in forest health on Non-Industrial private forest land.
Revegetation on unstable disturbed areas on Class 6e soil.
Prescribed grazing system need.
ANIMAL
Salmonid fish passage barriers.



The following Chart shows the listed plant and animal species under the Endangered Species Act (ESA). These species are a resource concern that must be addressed during the planning process. For additional information contact the United States Fish & Wildlife Service (USF&W) and/or the National Marine Fisheries Service (NMFS).

If planned practices will be applied in an area where potential listed species or its designated critical habitat may be affected either positively or negatively, than a Biological Assessment (BA) must be conducted.

Animal and Plant Species Included in the Endangered Species Act for the Lower Grand Ronde Watershed		
Common Name	Scientific Name	Type
<i>Endangered Species</i>		
None		
<i>Threatened Species</i>		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	<i>Bird</i>
Chinook Salmon	<i>Oncorhynchus tsawytscha</i>	<i>Fish</i>
Steelhead	<i>Oncorhynchus mykiss</i>	<i>Fish</i>

Farm Bill Programs

Performance Results ²¹

Lower Grande Ronde

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This section highlights the conservation application that has been reported from FY 2001 through FY 2006. Performance Results System (PRS) data was extracted from PRS reports by year, conservation systems by Hydrologic Unit Code (HUC). HUC reports were not available where NA. For additional information and other performance reports visit <http://ias.sc.egov.usda.gov/prshome/>.

	FY02	FY03	FY04	FY05	FY06	Total
Conservation Systems (Acres)						
Total Conservation Systems Planned	205	0	NA	2,049	77	2,331
Total Conservation Systems Applied	0	145	NA	1,886	429	2,460
Conservation Treatments						
Waste Management (no.)	0	0	0	0	0	0
Buffers (acres)	0	73	115	0	20	208
Erosion Control (tons/year)	2,123	0	NA	0	0	2,123
Erosion Control (acres)	403	0	NA	0	0	403
Irrigation Management (acres)	0	0	0	0	0	0
Nutrient Management (acres)	0	0	0	0	0	0
Pest Management (acres)	0	0	155	0	0	155
Prescribed Grazing (acres)	0	0	0	980	0	980
Tree and Shrub Establishment (acres)	0	142	2	0	1	145
Wildlife Habitat (acres)	90	173	0	0	0	263
Wetlands (acres)	0	0	0	0	0	0

This table lists the farm bill program participation in the watershed during the last five years. Data was collected from Conservation Systems Planned using Farm Bill Programs from PRS reports for the hydrologic unit area. NA indicates that the information was not available.

	FY02	FY03	FY04	FY05	FY06	Total
Conservation Systems Planned Using Farm Bill Programs (acres)						
Conservation Reserve Program (CRP)	205	145	124	13	0	487
Conservation Security Program (CSP)	NA	NA	NA	1,548	-	1,548
Environmental Quality Incentives Program - Ground and Surface Water (EQIP-GSWC)	0	0	0	0	0	0
Environmental Quality Incentives Program (EQIP)	0	0	0	0	0	0
Farmland Protection Program (FPP)	0	0	0	0	0	0
Forestry Incentives Program (FIP)	0	0	0	0	0	0
Grassland Reserve Program (GRP)	0	0	0	0	0	0
Wetlands Reserve Program (WRP)	0	0	0	0	0	0

There are 180 farms in Asotin County and 255 farms in Columbia County, the core counties comprising 89% of the agricultural operations in the watershed. An analysis of the 2002 Agricultural Census data by zip code suggests there are 98 agricultural operations in the watershed. The county average farm size in the 2002 Census of Agriculture was 1558 acres for Asotin and 1156 acres for Columbia.



For Asotin County, the 2002 average market value of agricultural products sold was \$50,479 with a net cash farm income of \$17,485. The Asotin County net cash farm income was 52% of the statewide average. For Columbia County, the 2002 average market value of agricultural products sold was \$103,985 with a net cash farm income of \$39,399. The Stevens county net cash farm income was 116% of the statewide average.

The average farm size for Washington State in the 2002 Census of Agriculture was 426 acres with an average market value of agricultural products sold of \$148,327 and an average net cash farm income of \$33,925.

Population Ethnicity by County	Asotin	Columbia	Washington
White persons, percent, 2004 (a)	96.7%	97.8%	85.3%
Black persons, percent, 2004 (a)	0.3%	0.3%	3.5%
American Indian and Alaska Native persons, percent, 2004 (a)	1.2%	0.9%	1.6%
Asian persons, percent, 2004 (a)	0.7%	0.6%	6.3%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.0%	0.0%	0.5%
Persons reporting two or more races, percent, 2004	1.2%	0.4%	2.9%
Persons of Hispanic or Latino origin, percent, 2004 (b)	2.2%	5.7%	8.5%
White persons, not Hispanic, percent, 2004	94.6%	92.3%	77.5%

ECONOMIC CHARACTERISTICS by County	Asotin		Columbia		Washington	
	Number	%	Number	%	Number	%
INCOME IN 1999						
Households	8,352	100	1,688	100	2,272,261	100
Less than \$10,000	874	11	159	9	171,863	8
\$10,000 to \$14,999	667	8	171	10	124,848	6
\$15,000 to \$24,999	1,529	18	279	17	265,131	12
\$25,000 to \$34,999	1,266	15	247	15	284,630	13
\$35,000 to \$49,999	1,503	18	341	20	389,434	17
\$50,000 to \$74,999	1,375	17	294	17	486,392	21
\$75,000 to \$99,999	602	7	111	7	264,498	12
\$100,000 to \$149,999	377	5	63	4	188,513	8
\$150,000 to \$199,999	72	1	5	0	47,615	2
\$200,000 or more	87	1	18	1	49,337	2
Median household income (dollars)	33,524	0	33,500	0	45,776	0

Reports

Census Data - Economic Characteristics

Lower Grande Ronde
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	Asotin		Columbia		Washington	
ECONOMIC CHARACTERISTICS by County	Number	%	Number	%	Number	%
Employed civilian population 16 years and over	9,211		1,720		2,793,722	
OCCUPATION						
Management, professional, and related occupations	2,619	28	543	32	993,198	36
Service occupations	1,764	19	313	18	416,056	15
Sales and office occupations	2,280	25	372	22	723,256	26
Farming, fishing, and forestry occupations	131	1	86	5	43,495	2
Construction, extraction, and maintenance occupations	975	11	188	11	263,767	9
Production, transportation, and material moving occupations	1,442	16	218	13	353,950	13
INDUSTRY						
Agriculture, forestry, fishing and hunting, and mining	300	3	229	13	68,976	3
Construction	684	7	109	6	194,871	7
Manufacturing	1,107	12	150	9	348,646	13
Wholesale trade	287	3	46	3	113,526	4
Retail trade	1,240	14	134	8	338,772	12
Transportation and warehousing, and utilities	469	5	99	6	150,985	5
Information	142	2	39	2	95,669	3
Finance, insurance, real estate, and rental and leasing	563	6	81	5	170,622	6
Professional, scientific, management, administrative, and waste management services	546	6	64	4	272,466	10
Educational, health and social services	2,158	23	344	20	541,214	19
Arts, entertainment, recreation, accommodation and food services	791	9	139	8	221,656	8
Other services (except public administration)	578	6	126	7	135,379	5
Public administration	346	4	160	9	140,940	5
CLASS OF WORKER						
Private wage and salary workers	6,780	74	1,073	62	2,125,029	76
Government workers	1,486	16	431	25	459,722	17
Self-employed workers in own not incorporated business	892	10	207	12	199,827	7
Unpaid family workers	53	1	9	1	9,144	0



2002 AG CENSUS DATA	Asotin	Columbia
Farms (number)	180	255
Land in farms (acres)	280,393	294,661
Total cropland (acres)	95,643	192,226
Irrigated land (acres)	1,721	2,798
Principal operator by primary occupation - Farming (number)	99	178
Principal operator by place of residence - On farm operated (number)	138	182
Farms by Size		
Average size of farm (acres)	1,558	1,156
1 to 9 acres	31	25
10 to 49 acres	23	38
50 to 69 acres	2	3
70 to 99 acres	3	3
100 to 139 acres	7	23
140 to 179 acres	9	10
180 to 219 acres	4	7
220 to 259 acres	1	10
260 to 499 acres	8	28
500 to 999 acres	14	34
1,000 to 1,999 acres	31	31
2,000 acres or more	47	43
Livestock and Poultry		
Inventory - Cattle and calves (farms)	101	97
Inventory - Cattle and calves - Beef cows (farms)	80	80
Inventory - Cattle and calves - Milk cows (farms)	5	5
Inventory - Hogs and pigs (farms)	4	6
Inventory - Sheep and lambs (farms)	7	13
Inventory - Layers 20 weeks old and older (farms)	5	8
Inventory - Broilers and other meat-type chickens (farms)	0	2



2002 AG CENSUS Data	Asotin	Columbia
Selected Crops Harvested (acres)		
Harvested cropland (acres)	40,679	123,855
Harvested cropland - Irrigated (acres)	203	2,500
Corn for grain (acres)	0	0
Corn for grain - Irrigated (acres)	0	0
Corn for silage or greenchop (acres)	0	0
Corn for silage or greenchop - Irrigated (acres)	0	0
Wheat for grain, all (acres)	25,703	93,461
Wheat for grain, all - Irrigated (acres)	0	777
Wheat for grain, all - Winter wheat for grain (acres)	18,104	66,093
Wheat for grain, all - Spring wheat for grain (acres)	7,599	0
Barley for grain (acres)	6,853	14,790
Barley for grain - Irrigated (acres)	0	144
Oats for grain (acres)	0	551
Oats for grain - Irrigated (acres)	0	0
Potatoes (acres)	0	0
Sugarbeets for sugar (acres)	0	0
Forage - land used for all hay, haylage, grass silage, and greenchop (acres)	5,827	3,309
Forage - land used for all hay, haylage, grass silage, and greenchop - Irrigated (acres)	71	1,063
Vegetables harvested for sale (acres)	15	0
Land in orchards (acres)	71	0
Land in orchards - Irrigated (acres)	68	0



A limited amount of natural resource and socio-economic studies have been conducted in the Lower Grand Ronde watershed. However, numerous studies have been conducted in the Middle Snake WRIA that includes the Lower Grand Ronde. In addition, to water quality studies, the U.S. Forest Service, Umatilla National Forest address resource needs on National Forest lands within the Lower Grand Ronde Watershed as part of their Forest planning process.

The Washington Department of Fish and Wildlife also engages in a natural resource planning process to address resource concerns within the Joseph Creek Wildlife Area. The Washington Department of Natural Resources conducts studies ranging from road inventories, culvert location and Habitat Conservation Plans. The following list and links are from the Washington Department of Ecology:

WRIA 35, Middle Snake

Title	Number	Date
Progress on Watershed Planning and Setting Instream Flows	05-11-038	December 2005
Transforming Watersheds: Tenmile Creek -- Asotin County	05-10-090	November 2005
Quality Assurance Project Plan: Pataha Creek Effectiveness Monitoring Total Maximum Daily Load Study	05-03-203	August 2005
Transforming Watersheds: Upper Alpowa Creek - Garfield County	05-10-066	July 2005
Transforming Watersheds: Deadman Creek – Garfield County	05-10-049	June 2005
Transforming Watersheds: Couse Creek – Asotin County	05-10-017	February 2005
Total Maximum Daily Load for Lower Snake River Total Dissolved Gas	03-03-020	August 2003
Total Dissolved Gas Monitoring Results Columbia and Snake Rivers, May-July 2002	02-03-051	November 2002
Quality Assurance Project Plan: Mid Columbia and Snake Rivers Total Dissolved Gas TMDL Field Monitoring	02-03-067	July 2002
River and Stream Ambient Monitoring Report for Water Year 2000	01-03-042	December 2001
River and Stream Ambient Monitoring Report for Water Year 1997	99-332	August 1999
Aquatic Plants Technical Assistance Program 1997 Activity Report	98-311	1998
River and Stream Ambient Monitoring Report for Wateryear 1996	98-317	1998
River and Stream Ambient Monitoring Report for Wateryear 1995	96-355	1997

Footnotes and Bibliographies



All information 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. Rapid Watershed Assessment (RWA) 8-digit Hydrologic Unit (HU) boundaries are from the U.S. Geological Survey huc250k vector data layer published in 1994. The data is based on the Hydrologic Unit Maps published by the U.S. Geological Survey Office of Water Data Coordination, together with the list descriptions and the name of the region, subregion, accounting unit, and cataloging unit. The hydrologic units are encoded with an eight-digit number that indicates the hydrologic region (first two digits), hydrologic subregion (second two digits), accounting unit (third two digits), and cataloging unit (fourth two digits). The HU data was downloaded from the NRCS Geospatial Data Gateway: <http://datagateway.nrcs.usda.gov/>. Tribal reservation boundaries are from the Washington State Department of Ecology (WDOE) 1:100,000 scale State Tribal Lands vector data layer. This layer can be downloaded from <http://www.ecy.wa.gov/services/gis/data/data.htm#tribal>.
2. General Soils were derived from the General Soil Map, Washington (1:500,000 scale), by Maureen Boling, Bruce Frazier and Alan Busacca, Washington State University, 1998. The soil map is the product of the combined efforts of Washington State University and its National Cooperative Soil Survey Partners, the USDA Natural Resources Conservation Service and Forest Service. More information visit <http://remotesens.css.wsu.edu/washingtonsoil/index.htm>.
3. The Relief map was created using a seamless, statewide, 30-meter resolution USGS digital elevation model (DEM) raster clipped to the watershed boundary. This DEM was colored to represent relative relief and draped over a 30-meter hillshade grid derived from the statewide DEM to create a 3- effect. The mountain peaks and town locations are from the 2004 USGS Geographic Names Information System (GNIS) Non-populated Places and Populated Places datasets. The GNIS data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
4. Average Annual Precipitation is from the Parameter-elevation Regressions on Independent Slopes Model (PRISM) raster data. This annual precipitation data is derived from the climatological period of 1961-1990. The PRISM raster data is the underlying dataset from which the polygons and vectors were created. For more information about PRISM visit http://www.ocs.orst.edu/prism/prism_new.html. Precipitation data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
5. The Land Use/Land Cover data was generated from the National Land Cover Dataset (NLCD) compiled from Landsat satellite TM imagery (circa 1992) with a spatial resolution of 30 meters and supplemented by various ancillary data (where available). The data was assembled by the USGS and published in June of 1999. The analysis and interpretation of the satellite imagery was conducted using very large, sometimes multi-state image mosaics. 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.

For more information about NLCD visit <http://landcover.usgs.gov/natl/landcover.php>. The data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>. For more information on Land Use designations, refer to the NRCS Planning Procedures Handbook, March 2003.

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6. Common Resource Area (CRA) Map delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA. For more information about a CRA visit <http://soils.usda.gov/survey/geography/cra.html>.
7. Fish species distribution for both streams and lakes was obtained by overlaying a clear plastic outline of Washington State, with the chosen watershed highlighted, onto a similar-sized fish-distribution map found for each fish species in the publication, "Inland Fishes of Washington". Wydoski, R. S. and R. R. Whitney. 2003. Inland Fishes of Washington (2nd edition). American Fisheries Society and University of Washington Press. 320 pp. Many fish species are shown as living only in the main stem Columbia or Snake Rivers. If one of these rivers runs through, or is a boundary of a target watershed, river-borne species were included in the watershed. Likewise, estuary-type fish such as starry flounders, that are often found well upstream from saltwater, are included in most watersheds that drain to salt water.
8. Fish barrier information was downloaded from the SalmonScape website at: (<http://wdfw.wa.gov/mapping/salmonscape/>). This Washington Department of Fish and Wildlife website offers an online source of maps at the 1:24,000 scale for planners to identify and prioritize their stream restoration and protection activities. The site merges fish presence and habitat data collected by state, federal, tribal and local biologists and presents it in an integrated system that can be readily accessed by other agencies and the public. It is part of the larger StreamNet program for Northwestern States.
9. Stream statistics were obtained from 1:100,000 scale StreamNet data layers found at: <http://www.streamnet.org/pnwr/fileaccess.html>. StreamNet (<http://www.streamnet.org/>) 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 (<http://www.psmfc.org/>). It is recognized that a 100K map scale may show less streams and less stream miles than a 24K map, but it still gives a useful comparison between watersheds.
10. General Ownership is derived from the 1:100,000 scale Washington Public Lands (2005) layer. The layer is comprised of the best available data compiled at 1:100,000 scale. This data layer is a compilation of the Washington State Department of Natural Resources (WDNR) Managed Land Parcels layer and the Washington State Major Public Lands (Non-DNR or NDMPL) layer. The combination of these two data layers is intended to reflect the most current general ownership (and extent of public lands) digital data in Washington State at the 1:100,000 scale. These data layers were downloaded from the WDNR Available GIS Data website: <http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html>. The RWA map describes occurrences within the watershed of land ownership/management areas for federal, tribal, state, local and private entities. For current ownership status, consult official records at appropriate Federal, State, and county offices.

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11. Farmland classifications were derived using the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) tabular and spatial data. This information can be referenced through the NRCS Field Office Technical Guide, Section II, Soils: soils data and interpretation databases. The following surveys were used:

Asotin County Area (Parts of Asotin and Garfield Counties), WA
(WA603) Published 2004 09 14

These surveys and tabular databases were downloaded from the NRCS Soil Data Mart at <http://soildatamart.nrcs.usda.gov>. Farmland classification layers were created using the soil surveys in the NRCS Soil Data Viewer (SDV). Visit the online Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov> for official and current USDA soil information as viewable maps and tables.

12. Washington Department of Ecology:
http://www.ecy.wa.gov/programs/wq/303d/wq_assessment_cats.html.
Washington State Water Quality Categories website:
<http://apps.ecy.wa.gov/wats/WATSQBEHome.asp> (In the first drop-down box, click on your WRIA of interest).
13. 303d listed streams were derived from the Washington State Department of Ecology's (WDOE) 2004 Washington Water Quality Assessment/303(d) List. This information was downloaded from the WDOE Statewide Datasets website: <http://www.ecy.wa.gov/services/gis/data/data.htm>.
14. 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/> .
15. NRCS General Manual, Part 401 - Cultural Resources (Archeological and Historic Properties)
http://policy.nrcs.usda.gov/scripts/lpsiis.dll/GM/GM_420_401_a.htm .
16. The Sole Source Aquifers were derived from the Sole Source Aquifers in Idaho, Oregon and Washington polygon layer (1996, scale unknown) acquired from the Environmental Protection Agency (EPA) Region 10, Office of Environmental Management and Information. For more information regarding these Sole Source Aquifers please visit http://ops.dot.gov/init/usa/metadata/epa/epa10_ss.htm .

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17. USFWS website for all federally listed animals and plants in Washington State.
http://ecos.fws.gov/tess_public/StateListing.do?state=WA&status=listed .
18. Washington State's Rare Plant Species Populations and Endangered Ecosystems from the Washington Natural Heritage Program WNHP (Current and Historic) Data Set (September 2005). In designing the WNHP Data Set, Washington Natural Heritage Program sought to license and distribute a GIS data set for use in land use planning and management. In order to balance the interests of data users with species protection, the precise locations of rare plant populations are not included. These locations are instead represented by 'areas-of-concern'. Occurrences of species considered critically imperiled are generalized as larger areas-of-concern polygons. Some known element occurrences have been completely removed from this data set before distribution because information on these elements is considered sensitive at this time. For more information please visit the WNHP website at www.dnr.wa.gov/nhp.
19. ESA-listed bull trout population delineations (termed by USFWS as a DPS, or Distinct Population Segment) were obtained from the following 1:100,000 scale StreamNet data layer: sp1498_Bulltrout_Icc. Similar information can be viewed in the Federal Register publication of the USFWS, 50 CFR Part 17, "Endangered And Threatened Wildlife Plants; Designation of Critical Habitat for the Bull Trout; Final Rule" September 26, 2005; page 56267:
<http://www.fws.gov/pacific/bulltrout/final/pdf/Bull%20Trout%20CH%20FR%20notice.pdf> .
20. ESA-listed salmon and steelhead population delineations (termed by NMFS as an ESU, or Evolutionary Significant Unit) were obtained from data layers compiled by a GIS group from the Bonneville Power Administration, using written descriptions in National Marine Fisheries Service (NMFS) status reviews and mapping provided by NMFS. Drainage basin delineation and upstream barriers were based on 1:100,000 stream hydrography and available digital topography (1:250,000). General ESU maps can be found at the NMFS website:
<http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Maps/>.
21. Performance Results System (PRS) data was extracted from PRS reports by year, conservation systems, and practices by Hydrologic Unit Code (HUC) and Farm Bill Program. HUC level reports were not available where NA is listed. For additional information and other performance reports visit <http://ias.sc.egov.usda.gov/prshome/> .
22. Ag Census data is from the National Agricultural Statistics Service (NASS) Website. For more information on individual census queries visit the NASS website at <http://www.nass.usda.gov/>. HUC specific data was derived from the 2002 Agricultural Census and adjusted by percent of zip code area/county in the HUC.
23. Population ethnicity data were extracted from the Census 2000 Summary File 3 compiled by the U.S. Census Bureau for Garfield and Whitman Counties and Washington State. For more information on census data and definitions visit <http://www.census.gov/Press-Release/www/2002/sumfile3.html>.

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24. Urban population and median household income data were derived from the American FactFinder assembled by the U.S. Census Bureau. American FactFinder is a quick source for population, housing, income and geographic data. For other census items and trends visit http://factfinder.census.gov/home/saff/main.html?_lan .
25. Washington Department of Ecology website: <http://www.ecy.wa.gov/biblio/wria35.html> . Publications listed by a Watershed Resource Inventory Area, WRIA 35, Middle Snake.

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