



United States Department
of Agriculture

Little Snake Watershed



Hydrologic Unit Code 14050003

Natural Resources
Conservation Service

Lakewood, Colorado

Rapid Assessment

RWA 14050003

July 2010



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Introduction

Background Information

The Natural Resources Conservation Service (NRCS) is encouraging the development of rapid watershed assessments in order to increase the speed and efficiency generating information to guide conservation implementation, as well as the speed and efficiency of putting it into the hands of local decision makers.

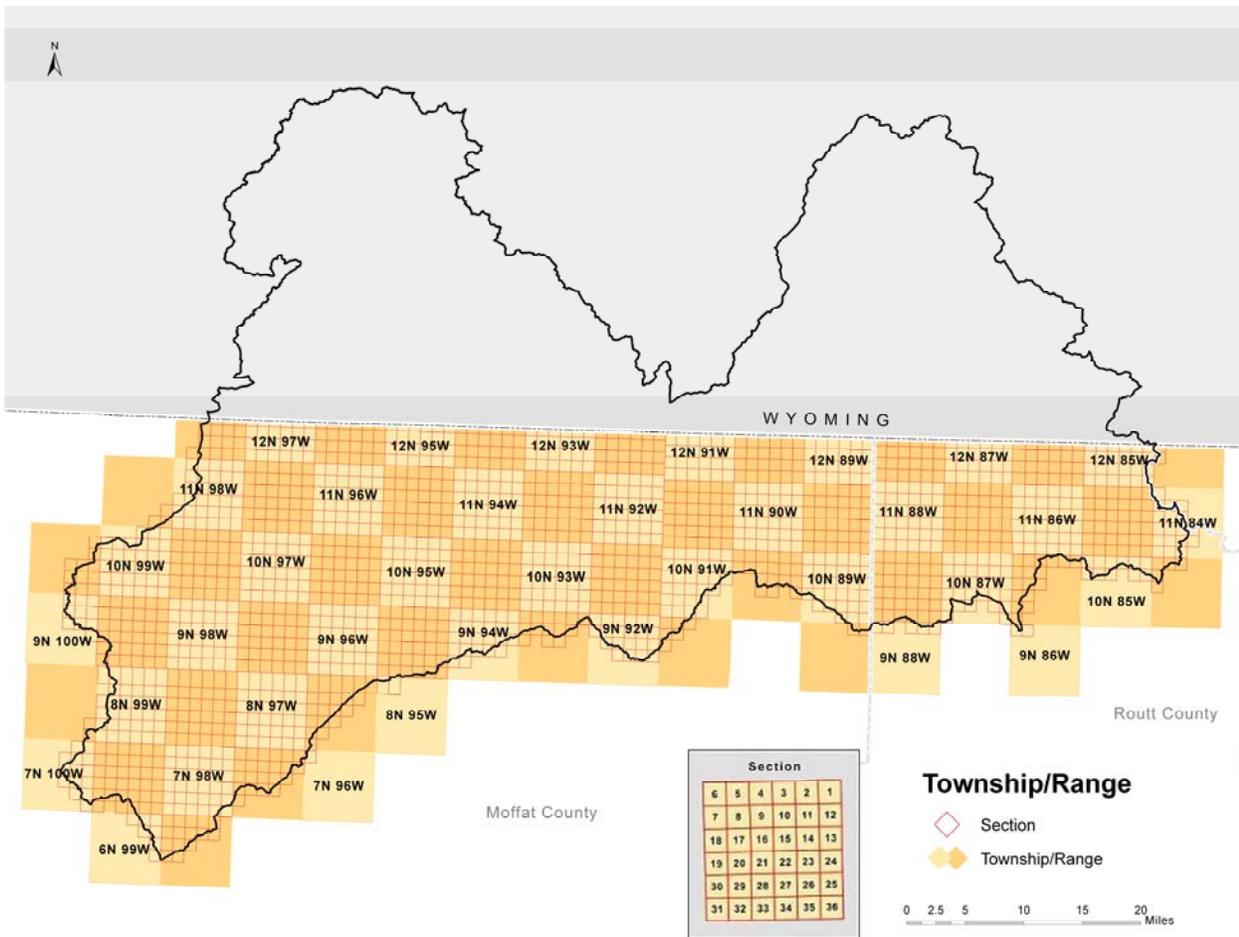
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best actions to achieve their goals.

Benefits of these Activities

While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

- Quick and inexpensive tools for setting priorities and taking action
- Providing a level of detail that is sufficient for identifying actions that can be taken with no further watershed-level studies or analyses
- Actions to be taken may require further Federal or State permits or ESA or NEPA analysis but these activities are part of standard requirements for use of best management practices (BMPs) and conservation systems
- Identifying where further detailed analyses or watershed studies are needed
- Plans address multiple objectives and concerns of landowners and communities
- Plans are based on established partnerships at the local and state levels
- Plans enable landowners and communities to decide on the best mix of NRCS programs that will meet their goals
- Plans include the full array of conservation program tools (i.e. cost-share practices, easements, technical assistance)

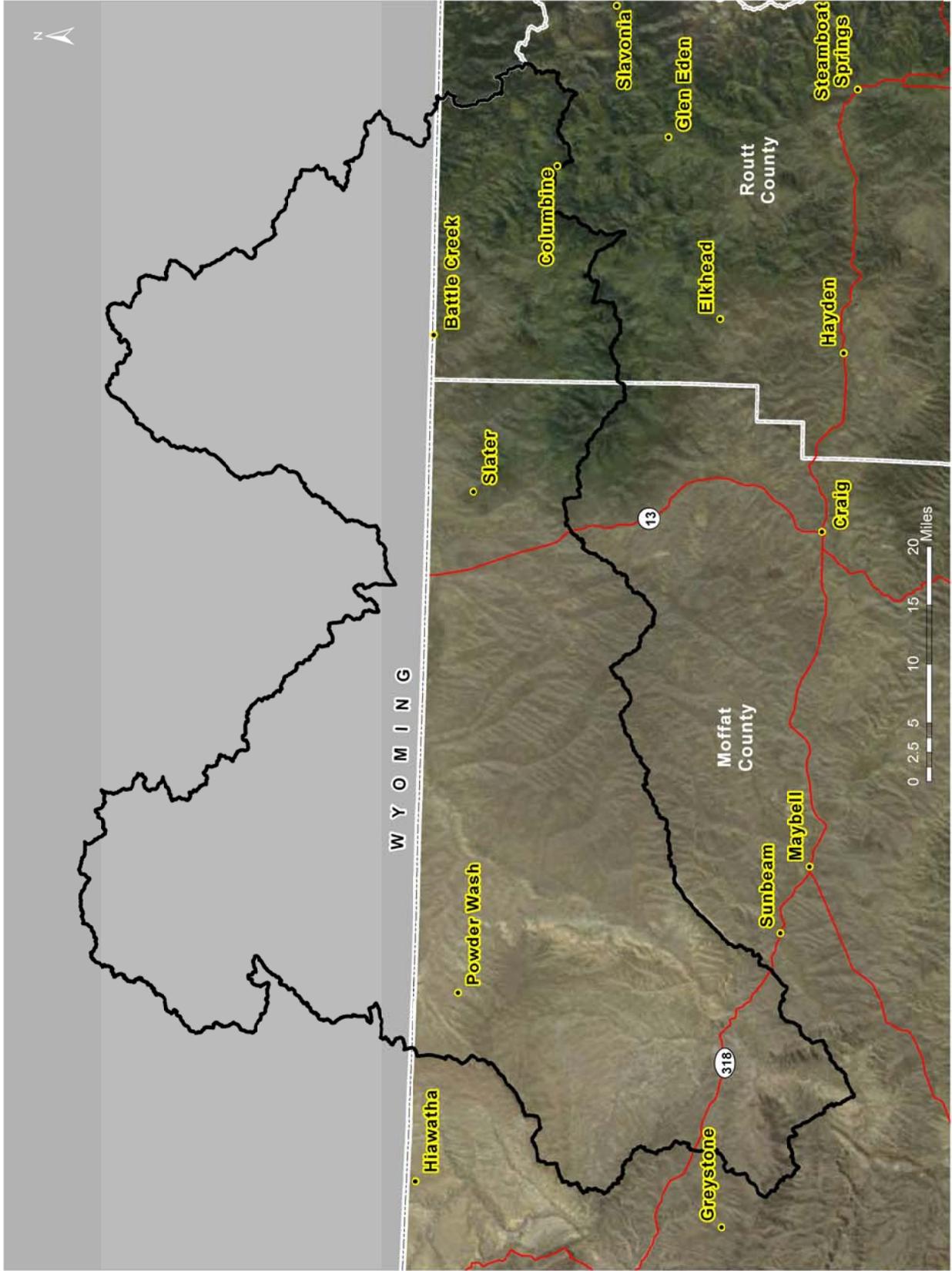
Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

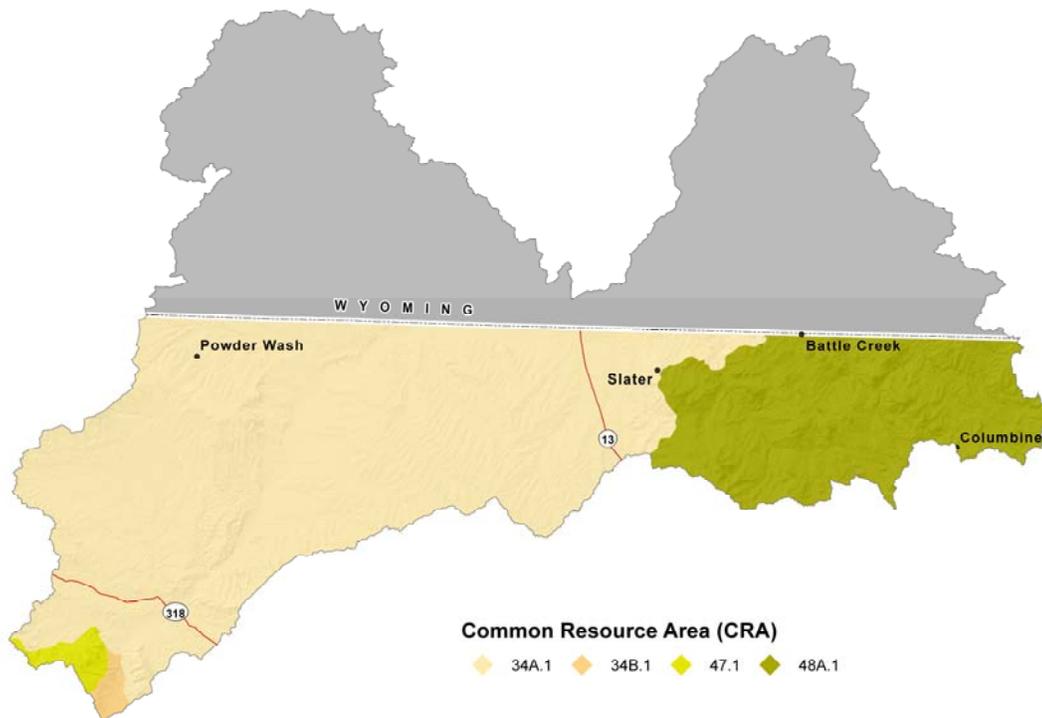


County	County Acres	County Acres in LITTLE SNAKE Watershed	% of County in the Watershed	% of Watershed in the County
Moffat	3,043,713	890,579	29.3%	81.2%
Routt	1,515,384	206,477	13.6%	18.8%

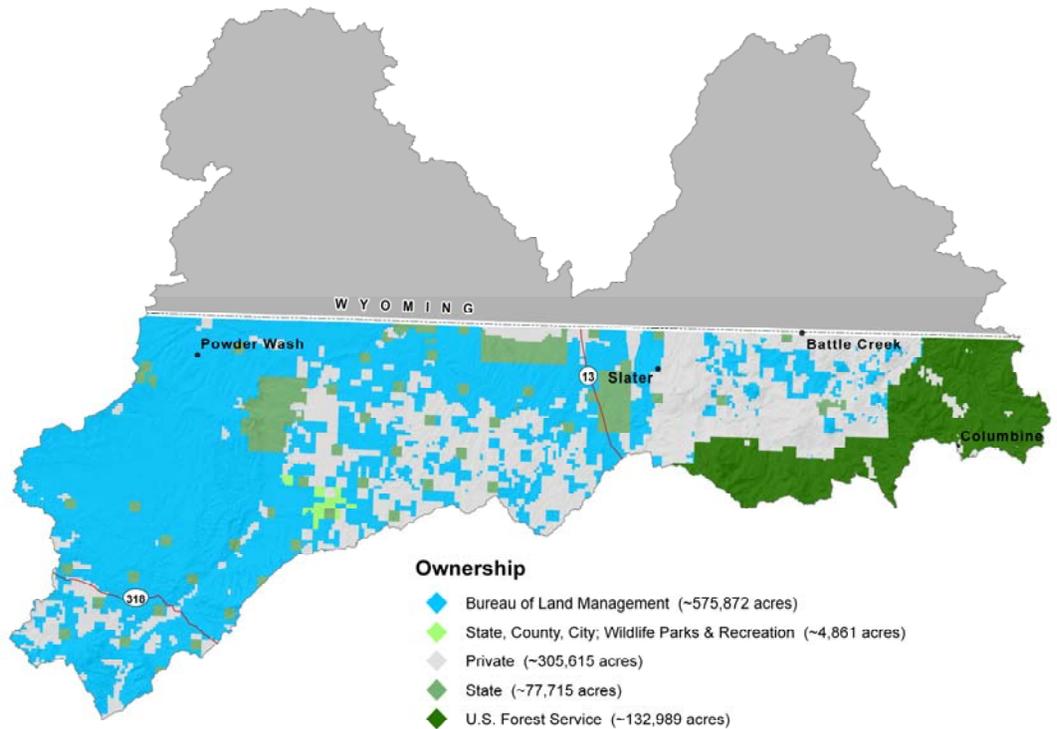
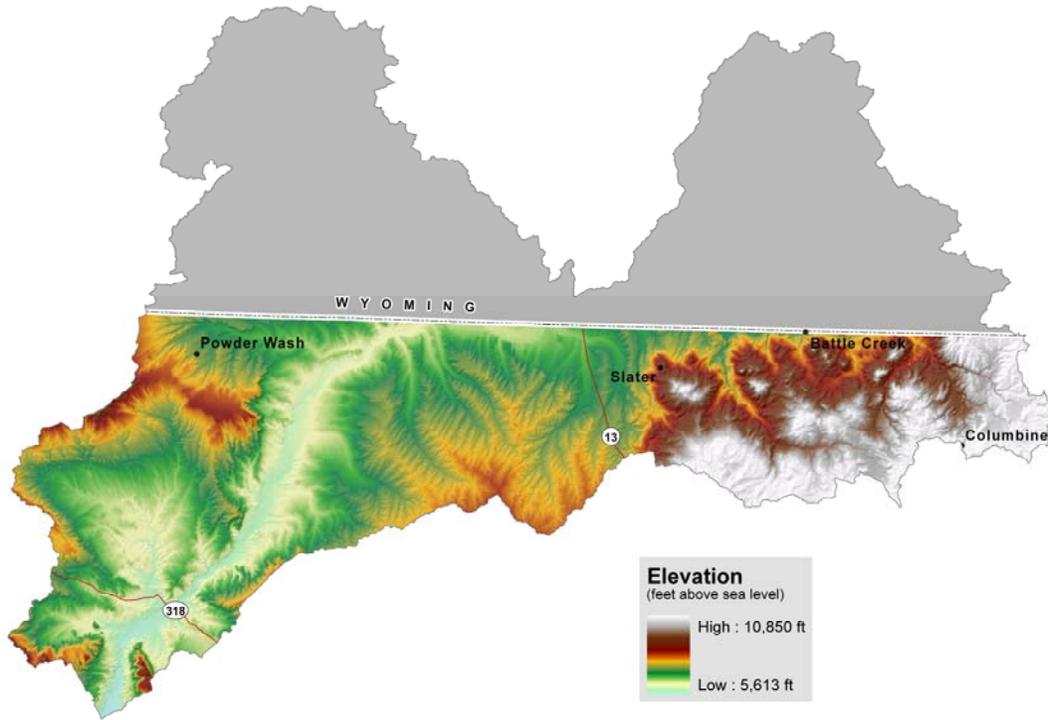
1,097,056

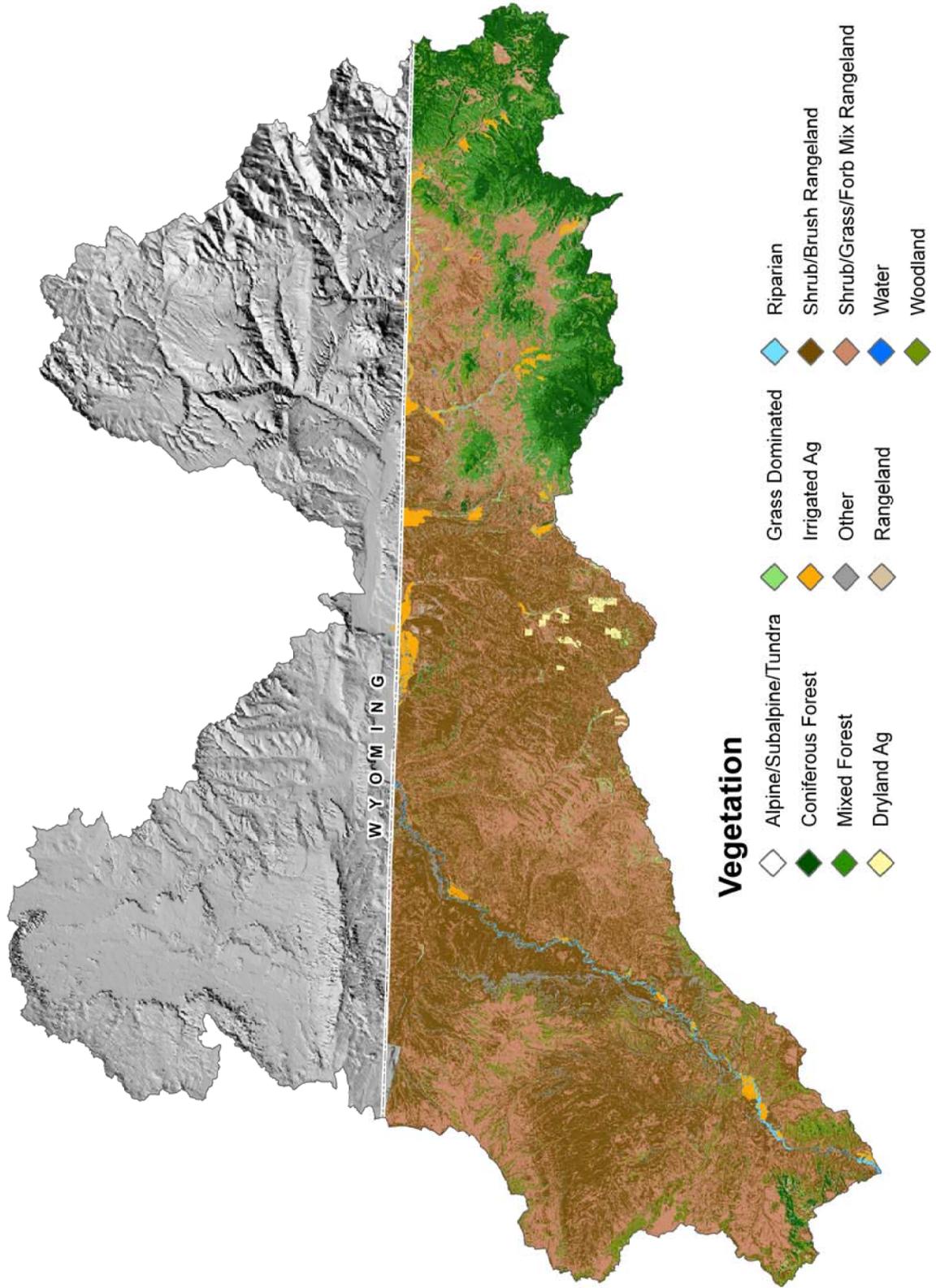
Little Snake Watershed - 14050003





MLRA	CRA	CRA NAME	CRA DESCRIPTION
34A	34A.1	Cool Central Desertic Basins and Plateaus--Green River Basin	This unit is in the cool semiarid basins, plateaus, and low mountains that are west of the Continental Divide in MLRA 34A. Soils have an aridic moisture regime and frigid temperature regime. Vegetation is sagebrush or shadscale and bunchgrasses. Major use is range. Precipitation ranges from 7 to 14 inches. Elevations range from about 4,000 to 7,000 feet.
34B	34B.1	Warm Central Desertic Basins and Plateaus - Semiarid Plateaus and Low Mountains	This area is on broad plateaus and in narrow saline basins in Colorado and Utah. Soils have an aridic moisture regime and a mesic temperature regime. Natural vegetation is typically big sagebrush and bunchgrasses. Major use is range. Precipitation ranges from 5 to 16 inches. Elevations range from about 4,500 to 6,000 feet.
47	47.1	Wasatch and Uinta Mountains - Low Mountains and Foothills; Utah, Wyoming, and Colorado	This unit is in the gently sloping to steep semiarid low mountains and hills in the Wasatch and Uinta Mountains. Soils have xeric or ustic moisture regimes with frigid or cryic temperature regimes. Precipitation ranges from 10 to about 18 inches. Elevations are about 5,000 to 8,000 feet. Range and cropland are the predominant land uses.
48A	48A.1	Southern Rocky Mountains - High Mountains and Valleys	This area is best characterized by steep, high mountain ranges and associated mountain valleys. The temperature regimes are mostly frigid and cryic; moisture regimes are mainly ustic and udic. Vegetation is sagebrush-grass at low elevations, and with increasing elevation ranges from coniferous forest to alpine tundra. Elevations range from 6,500 to



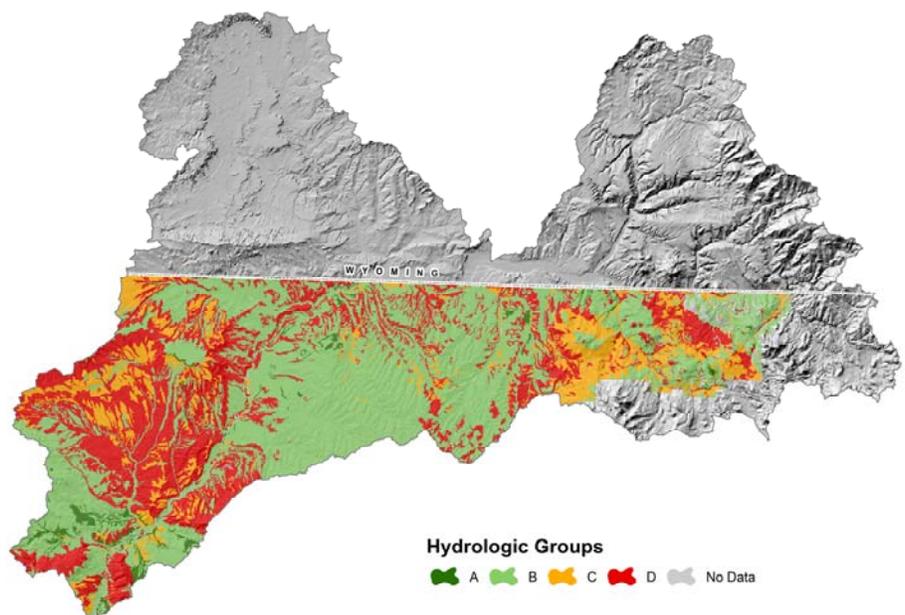
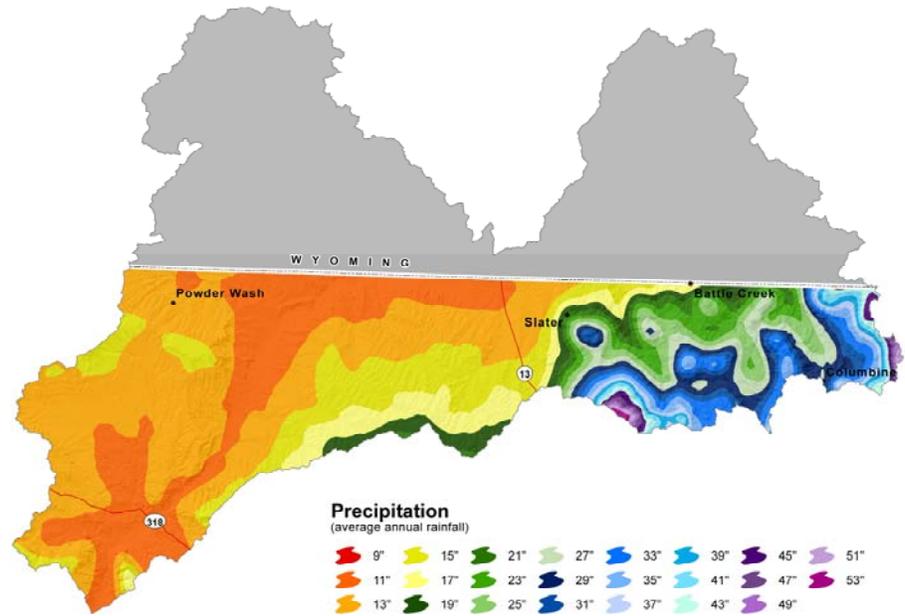


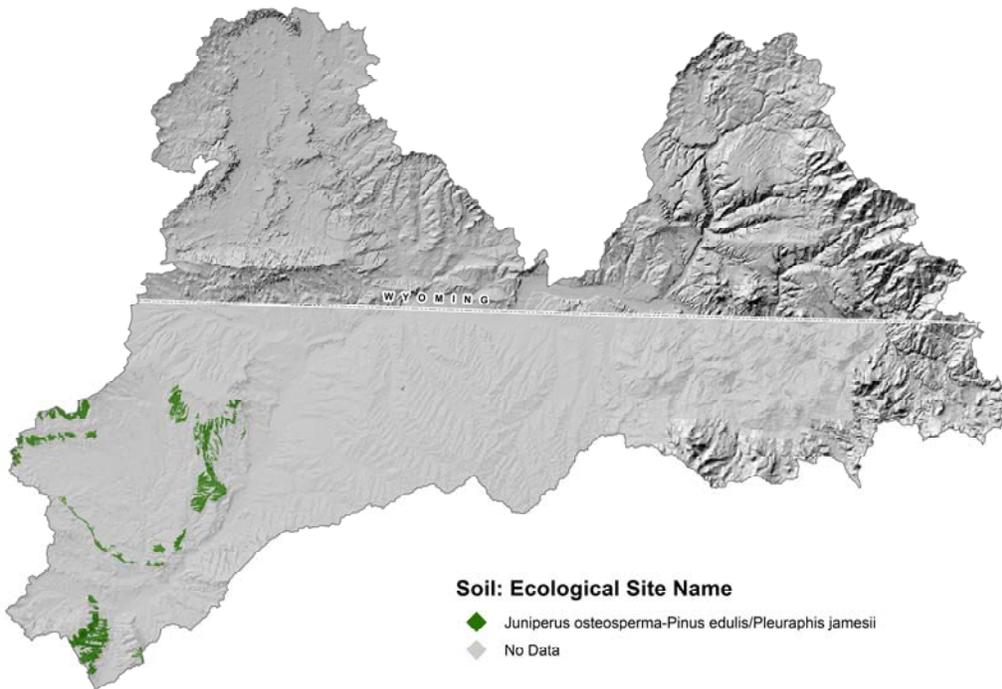
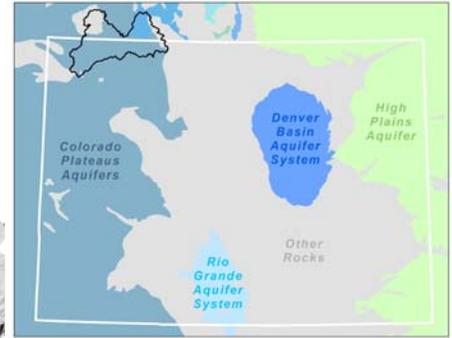
<u>LITTLE SNAKE WATERSHED</u> <u>Land Use</u>	Total Acreage	Vegetation	Acreage
Cropland	20,027	Dryland Ag Irrigated Ag*	3,168.0 16,859.0
Rangeland/Grassland	883,679	Bitterbrush Community Bitterbrush/Grass Mix Disturbed Rangeland Foothill and Mountain Grasses Grass Dominated Grass/Forb Mix Greasewood Juniper Juniper/Mtn Shrub Mix Juniper/Sagebrush Mix Mesic Mountain Shrub Mix PJ-Mtn Shrub Mix PJ-Sagebrush Mix Pinon-Juniper Sagebrush Community Sagebrush/Grass Mix Sagebrush/Greasewood Sagebrush/Mesic Mtn Shrub Mix Salt Desert Shrub Community Saltbush Community Shrub/Brush Rangeland Shrub/Grass/Forb Mix Sparse Juniper/Shrub/Rock Mix Sparse PJ/Shrub/Rock Mix	7,828.6 739.5 653.0 1,744.6 12,580.8 2,230.6 16,276.7 2,657.3 23.0 13,168.7 16,623.7 4,040.6 3,819.8 4,701.0 227,629.3 328,070.0 10,952.8 53,658.3 43,424.5 114,150.2 1,471.7 840.2 13,233.1 3,159.6
Forest	149,172	Aspen Aspen/Mesic Mountain Shrub Mix Douglas Fir Englemann Spruce/Fir Mix Lodgepole Pine Lodgepole Pine/Aspen Mix Lodgepole/Spruce/Fir Mix Ponderosa Pine Spruce/Fir/Aspen Mix Spruce/Fir/Lodgepole/Aspen Mix Spruce/Lodgepole Pine Mix	48,139.5 12,347.5 48.5 22,015.9 17,151.1 3,306.9 23,816.9 119.4 8,298.9 9,163.6 4,761.7
Riparian	13,752	Cottonwood Exotic Riparian Shrubs Forested Riparian Herbaceous Riparian Riparian Shrub Riparian Willow Upland Willow/Shrub Mix	1,368.3 535.0 119.5 818.4 208.2 3,331.0 3,205.7 4,166.4
Water	2,278	Water	2,277.7
Other	28,634	SubAlpine Shrub Community Subalpine Grass/Forb Mix Talus Slopes & Rock Outcrops	360.9 1,578.5 258.5
~Total Watershed Acres			1,097,500

* Colorado Decision Support Systems Data

Precipitation

Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series of hot, dry summers following a period of scant mountain snowpack created water shortages. The fourth drought hit parts of Colorado in the late 1970s. In this century, the most severe drought since 1723 hit the state in 2002. Prior to the 1700's, researchers looking at tree ring records have found evidence of even more severe droughts, some lasting many years.





Class 1 - soils have few limitations that restrict their use.

Class 2 - soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 - soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

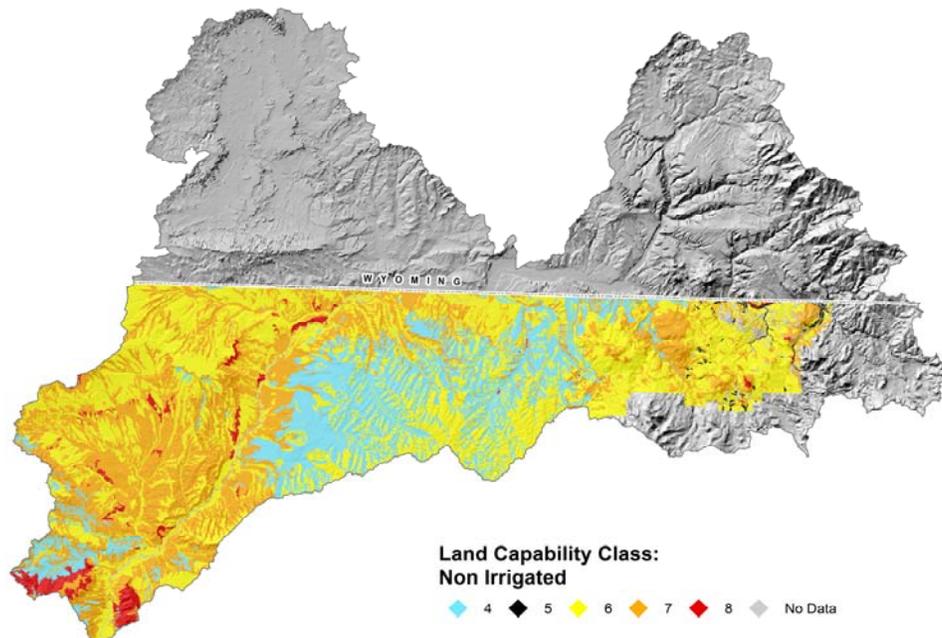
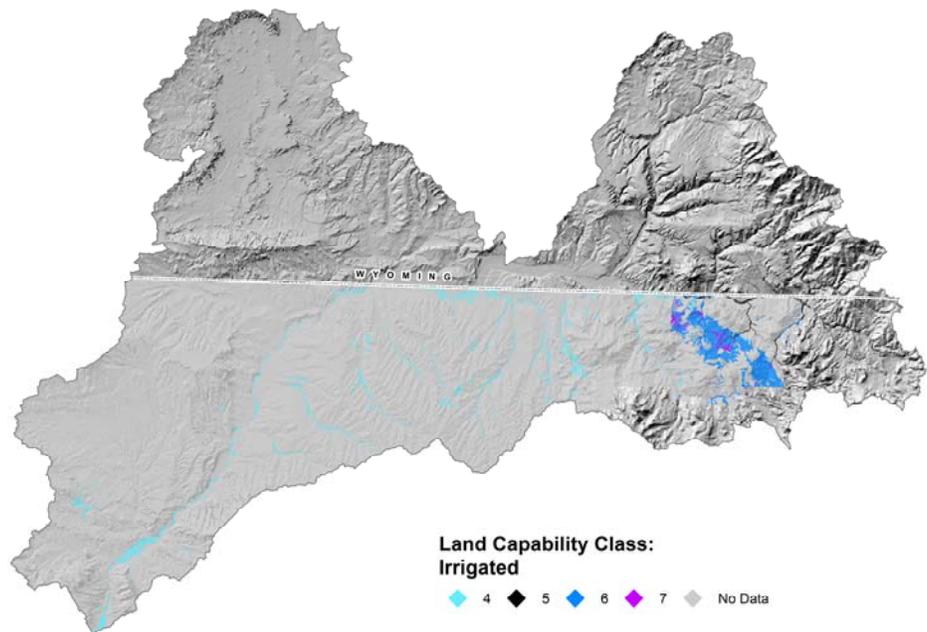
Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 - soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

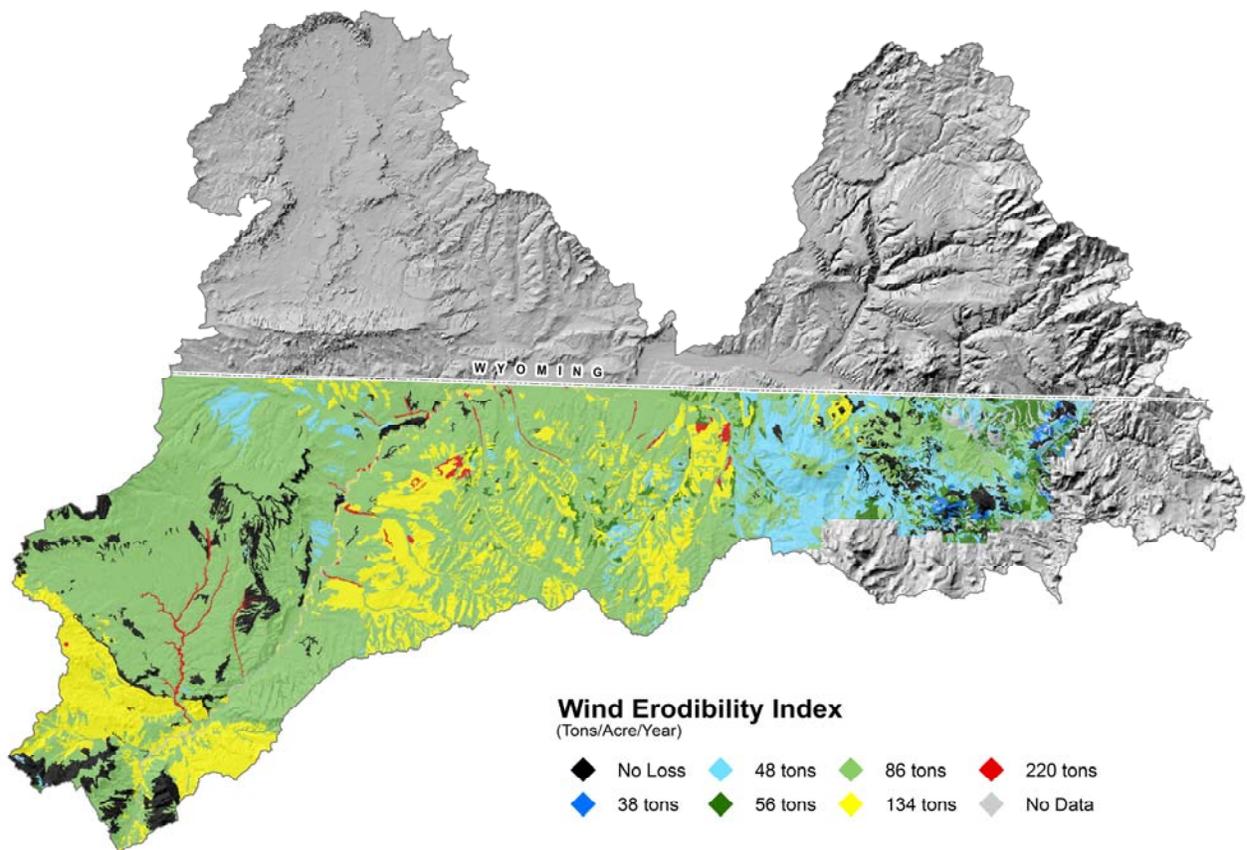
Class 7 - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

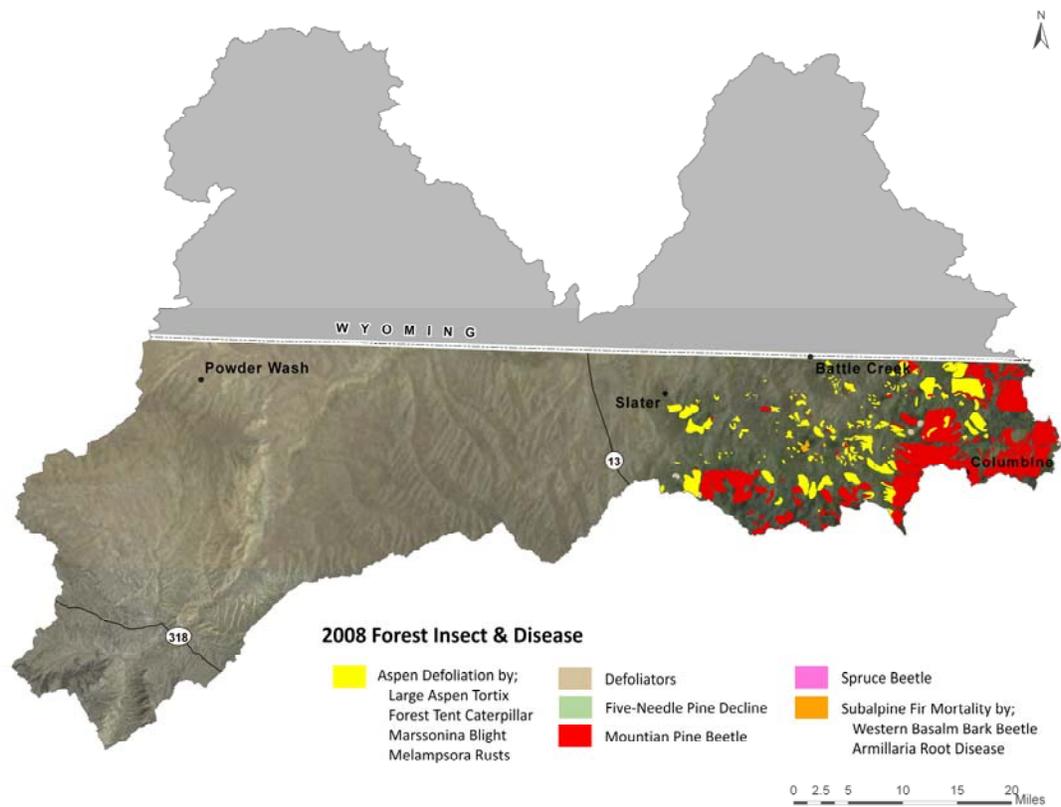
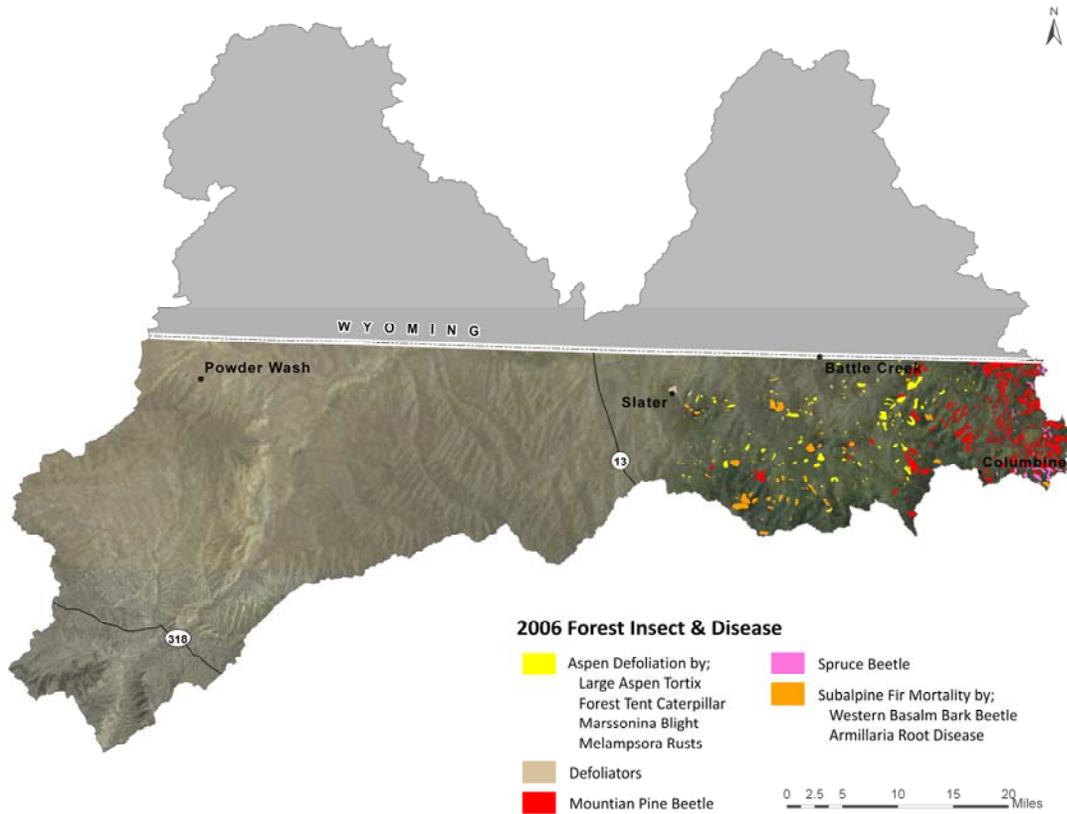
Class 8 - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.



The Wind Erodibility Index (WEI): numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion if it is assumed there is no vegetative cover or management.

Soils with an erodibility index equal to or greater than 8 are considered highly erodible.





State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Little Snake Watershed

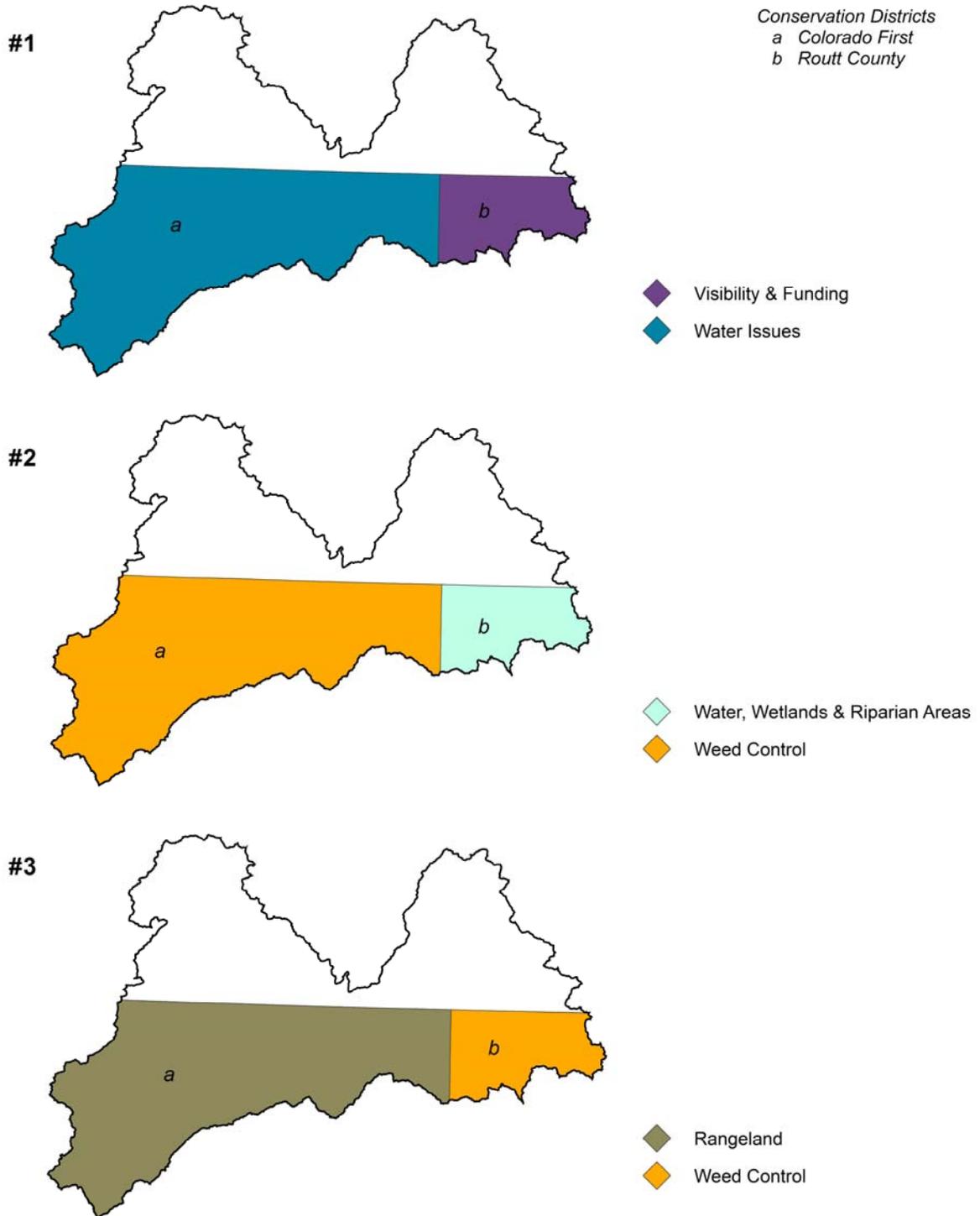
Common Name	Scientific Name	Class	State Status/ Federal Status	Comments
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Occurs year-round in the watershed
Bonytail	<i>Gila elegans</i>	Fish	Endangered/ Endangered	Water depletions in the watershed may affect downstream habitats/fish
Boreal Toad	<i>Bufo boreas boreas</i>	Amphibi- ans	Endangered/None	May occur in the watershed
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Fish	Threatened/ Endangered	Water depletions in the watershed may affect downstream habitats/fish
Canada Lynx	<i>Lynx canadensis</i>	Mam- mals	Endangered/ Threatened	May occur in the watershed
Colorado River Cutthroat Trout	<i>Oncorhynchus clarki pleuriticus</i>	Fish	Concern/None	May occur in the watershed
Colorado Roundtail Chub	<i>Gila robusta</i>	Fish	Concern/None	May occur in the watershed
Columbian Sharp-tailed Grouse	<i>Tympanuchus phasianellus columbianus</i>	Birds	Concern/None	Occurs in the watershed
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	Birds	Concern/None	Occurs in the watershed
Greater Sandhill Crane	<i>Grus canadensis tabida</i>	Birds	Concern/None	May occur in the watershed
Humpback Chub	<i>Gila cypha</i>	Fish	Threatened/ Endan- gered	Water depletions in the watershed may affect downstream habitats/fish
Mountain Sucker	<i>Catostomus platyrhynchus</i>	Fish	Concern/None	May occur in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibi- ans	Concern/None	Occurs in the watershed
Razorback Sucker	<i>Xyrauchen texanus</i>	Fish	Endangered/ Endangered	Water depletions in the watershed may affect downstream habitats/fish
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mam- mals	Concern/None	Occurs in the watershed
Western Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Birds	Concern/Candidate	May occur in the watershed

The terrestrial habitats in this watershed include small amounts of both irrigated and dry cropland; extensive acreage of big sagebrush and saltbush; some bitterbrush and pinyon-juniper shrub habitats; a small amount of lodgepole pine, ponderosa pine, spruce-fir, aspen, and Douglas fir forest habitats; and some subalpine meadow. Riparian areas, stock ponds, and a few lakes provide aquatic habitats in the watershed.

Economically important species in the watershed include: elk, mule deer, mountain lion, pronghorn, and sport fish throughout large parts of the watershed; black bear in the eastern and southwestern parts of the watershed; and snow geese in the Little Snake, its major tributaries, and associated riparian areas

Social Data	Moffat	Routt
Demographics (US Census, American Factfinder)		
Total population	13,184	19,690
Male	6,836	10,599
Female	6,348	9,091
Median age (years)	35.4	35
White	12,341	19,079
Black or African American	28	25
American Indian and Alaska Native	116	96
Asian	44	76
Native Hawaiian and Other Pacific Islander	3	18
Some other race	418	144
Hispanic or Latino (of any race)	1247	634
Economic Characteristics (US Census, American Factfinder)		
In labor force (population 16 years and over)	6,875	12,687
Median household income (dollars)	41,528	53,612
Median family income (dollars)	45,511	61,927
Per capita income (dollars)	18,540	28,792
Families below poverty level	249	135
Individuals below poverty level	1086	1183
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)		
Farms (number)	443	593
Land in farms/ranches (acres)	1,017,612	450,239
Average size farm/ranch (acres)	2,297	759
Median size farm (acres)	400	188
Average age of farmer or rancher	52.7	52.1
Net cash return from ag sales (\$1,000)	1,407	1,626
Cattle and calves (number)	32,000	26,000

Identified Long Range Resource Concerns Top Three Concerns within Conservation Districts



Selected Conservation Practices Applied, FY 2005 through FY 2009

Practice Code	Practice Name	Practice Unit	Applied Amount	Applied Count
645	Upland Wildlife Habitat Management	ac	45,800	60
449	Irrigation Water Management	ac	1,474	9
528	Prescribed Grazing	ac	15,091	18

Conservation Systems to Address Major Resource Concerns *from the Field Office Technical Guide*

Grazed Rangeland—The grazing Resources need improved plant condition (similarity index), productivity, health and vigor. Animals need feed, forage, and shelter. The animals are adapted to the climatic and ecological condition of the resources.

CO 34.1-GR-01

<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
314 Brush Management	This area encompasses the lower elevation mesas and Plateaus that represent the transition to the Southern Rocky Mountains. The typical vegetation is a scattered overstory of two needle pinyon and Utah juniper with a understory of big sagebrush and perennial bunchgrasses. In some areas pinyon and juniper can increase and become a dominant species.	Fish and Wildlife - T&E Species: Declining Species, Species of Concern Plant Condition - Productivity, Health and Vigor Soil Erosion - Sheet and Rill Soil Erosion - Wind
338 Prescribed Burning		
378 Pond		
382 Fence		
528 Prescribed Grazing		
574 Spring Development		
595 Pest Management		
614 Watering Facility		
645 Upland Wildlife Habitat Management		
666 Forest Stand Improvement		

Hayland—Wild flood irrigation system converted to Structure for Water Control, Underground & Gated Pipeline, IWM, and Forage Harvest Mgt.

CO 34.1-HY-Pipe—R-1

<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
430DD Irr. Water Conveyance, Pipeline, H	Cool season grasses, alfalfa, or alfalfa/ grass hay. Annual precipitation ranges from 8 - 20". Moisture usually lacking in the summer during peak ET and supplemented with gravity irrigation, the water source may be ground or surface water; rainfall often comes in short intense spring and early summer storms and as snowfall in the winter. Wildlife potential for use by elk, deer and other wildlife.	Soil Erosion - Sheet and Rill Soil Erosion - Wind Water Quantity - Inefficient Water Use on Irrigated Land
431 Above Ground, Multi-Outlet Pipeline		
443 Irrigation System, Surface and Subsurface		
449 Irrigation Water Management		
511 Forage Harvest Management		
587 Structure for Water Control		

Pasture—This system is a non irrigated pasture. Prescribed Grazing is applied to improve plant health and production. **CO 34A.1-PA-Dry**

<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
382 Fence	The pasture is non irrigated without significant slope. The pasture species are predominantly cool season and are sometimes utilized in conjunction with rangeland pastures.	Fish and Wildlife - T&E Species: Declining Species, Species of Concern Plant Condition - Productivity, Health and Vigor Soil Erosion - Sheet and Rill Soil Erosion - Wind
528 Prescribed Grazing		
614 Watering Facility		
645 Upland Wildlife Habitat Management		

Dry Cropland —Seasonal residue management system with Crop rotation, Nutrient and Pest Mgt. **CO 34A.1-CR-Dryland**

<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
328 Conservation Crop Rotation	Crops: small grains. Fallow usually included in rotation. Soils: heavy loams ,silt loams, and loams. Annual precipitation ranges from 8 - 20". Moisture usually lacking in the summer during peak ET; rainfall often comes in short intense spring and early summer storms and as winter snowfall. Wildlife potential for use by pheasant, grouse, deer and other wildlife. Long term agricultural production practices have resulted in sheet and rill erosion, wind erosion, soil compaction and decrease in organic matter.	Soil Erosion - Sheet and Rill Soil Erosion - Wind Water Quantity - Inefficient Water Use on Non-irrigated Land
344 Residue Management, Seasonal		
590 Nutrient Management		
595 Pest Management		

Estimated Costs of Application of Conservation Systems

Landuse	Estimated Acres Need to be Treated	Estimated Average Cost per Acre (\$)	Costs (\$)
Range	10,000	30	300,000
Crop	1,000	45	45,000
Hayland	8,000	880	7,040,000
Pasture	4,000	35	140,000

Total Costs: \$7,525,000

FOOTNOTES/ BIBLIOGRAPHY

303(d) listed streams within the Watershed were created using data from Colorado Department of Public Health & Environments' Water Quality & Control Commission. Impaired streams are current as of April 30, 2006. For a list of all Colorado impaired streams, locations and priority ratings, visit <http://www.cdphs.state.co.us/regulations/wqccregs/100293wqlimitedsegtmdls.pdf>.

Stream data from National Hydrologic Dataset <http://nhd.usgs.gov>

Threatened and Endangered Species information was gathered using data from the Colorado Division of Wildlife (CDOW) Natural Diversity Information Source (NDIS). NDIS GIS data may be downloaded at <http://ndis.nrel.colostate.edu>. For more information on Colorado's Endangered & Threatened Species, as well as Species of Concern, visit <http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/ThreatenedEndangeredList/ListOfThreatenedAndEndangeredSpecies.htm> or <http://mountainprairie.fws.gov/endspp/CountyLists/COLORADO.htm>

Resource Concerns were identified using the Colorado Association of Conservation Districts' (CACD) long range (10 year) plans from the period of 1996-2000. Only the top three environmental resource concerns for each district were used. For more information on Colorado's Conservation Districts, visit <http://www.cacd.us>.

Maps were generated using Soil Survey Geographic Database (SSURGO) tabular and spatial data. SSURGO data was downloaded for the following Colorado surveys:

Routt County Area (CO648) Published 9/25/2007

Moffat County Area (CO686) Published 2/4/2008

Vegetation data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. Completed in 2003, the CVCP is a landscape level vegetation dataset created using Landsat TM imagery and then formatted for GIS use. The species identified are an overview of the most common species associated in each cover type, in order of greatest occurrence. For more information on the Colorado Vegetation Classification Project, visit <http://ndis.nrel.colostate.edu/coveg>.

Common Resource Area (CRA), a subdivision of the Major Land Resource Area (MLRA), is a geographical area where resource concerns, problems, or treatment needs are similar. Geographic boundaries of a CRA are determined by landscape conditions, soil, climate, human considerations and other natural resource information. For more information on Common Resource Areas visit <http://soils.usda.gov/survey/geography/cra.html>.

Average Annual Precipitation data was developed through a partnership between the Natural Resources Conservation Service's (NRCS) National Water and Climate Center (NWCC), the National Cartography and Geospatial Center (NCGC), and the PRISM (the Parameter-elevation Regressions on Independent Slopes Model) group at Oregon State University (OSU), developers of PRISM. Mean annual precipitation maps were developed calculating averages of rainfall for the period of 1961-1990. For more information on PRISM data visit <http://www.ncgc.nrcs.usda.gov/products/datasets/climate/docs/fact-sheet.html> or for more information about technical aspects of PRISM, visit the PRISM website at <http://www.ocs.orst.edu/prism>.

Land Ownership (status,07/22/2006 dataset) data was obtained from the Bureau of Land Management, Colorado State Office. For more information, visit http://www.blm.gov/co/st/en/BLM_Programs/geographical_sciences/gis.html

Relief & Elevation maps were created using the National Elevation Dataset (NED), 30m Digital Elevation Model (DEM) raster product assembled by the U.S. Geological Survey (USGS). A hillshade grid was created from the 30m DEM to create a 3D effect. For more information about the NED visit <http://ned.usgs.gov>. The data was downloaded from the NRCS Geospatial Data Gateway at <http://datagateway.nrcs.usda.gov>.

Forest Insect & Disease data obtained from the U.S. Forest Service annual aerial survey. For more information visit <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>