



Colorado Department of  
Agriculture

State Conservation Board

United States Department  
of Agriculture

Natural Resources  
Conservation Service

Lakewood, Colorado

# Lone Tree—Owl

Hydrologic Unit Code 10190008

## Rapid Assessment

RWA 10190008

October 2009





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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

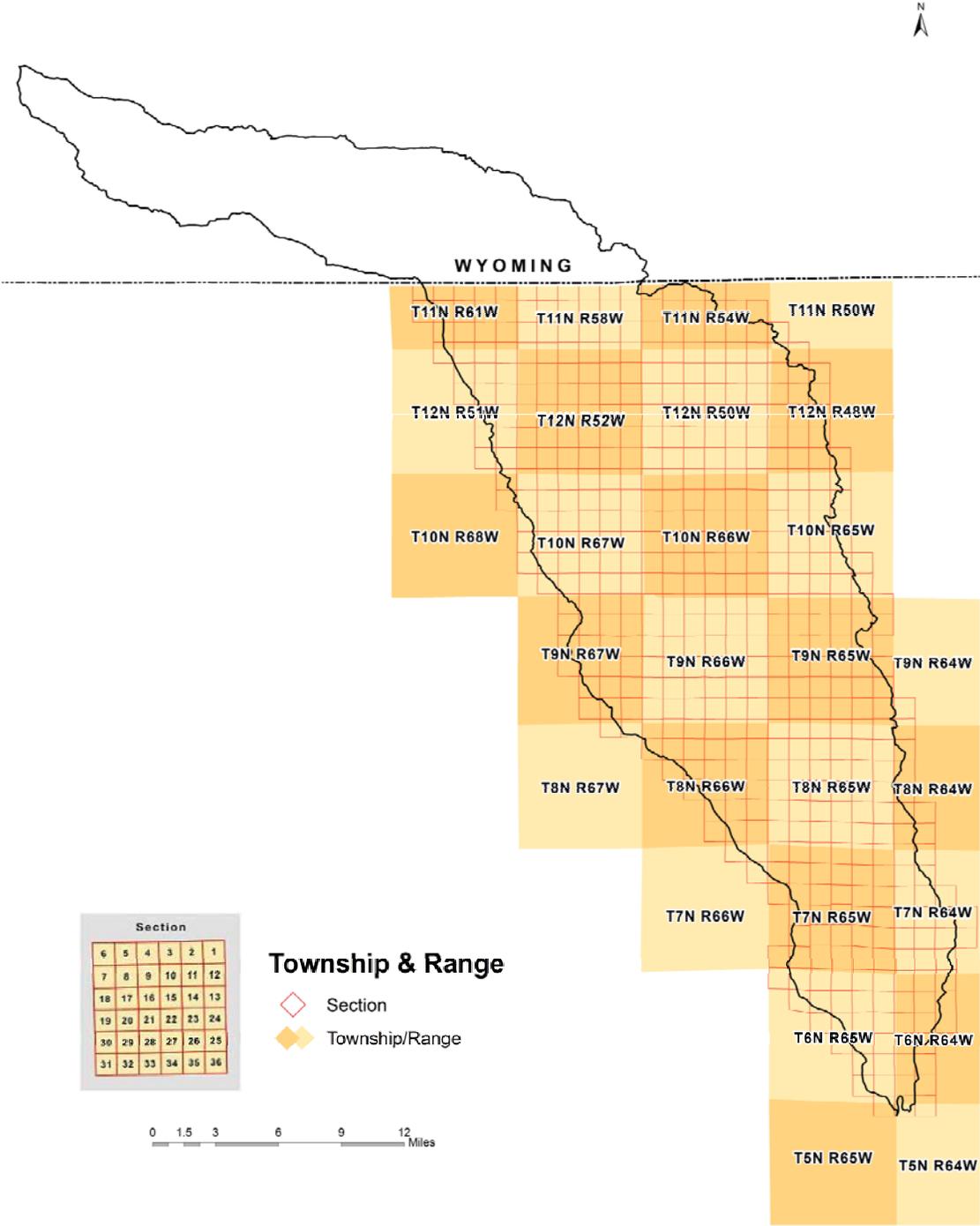
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

- 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)

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

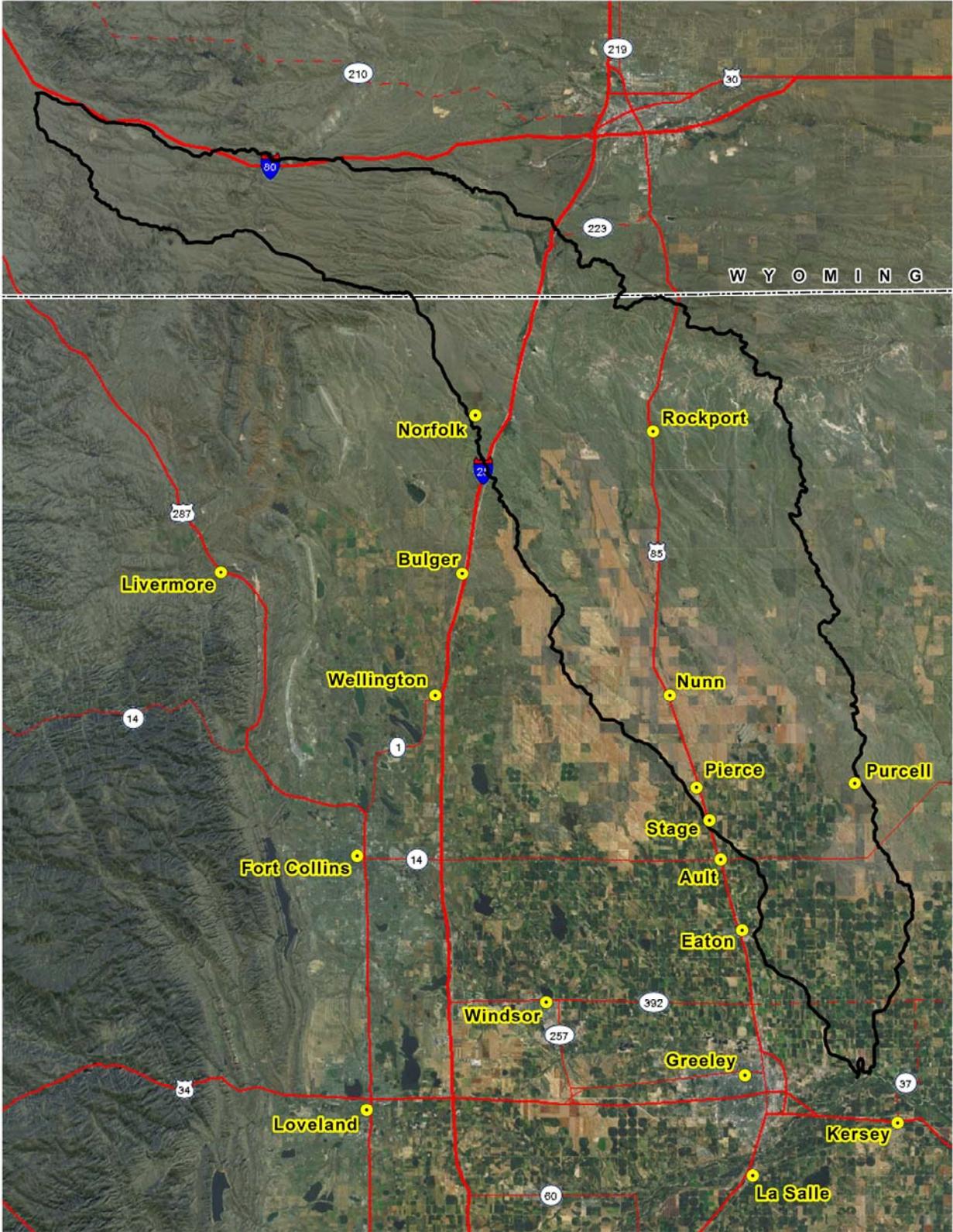
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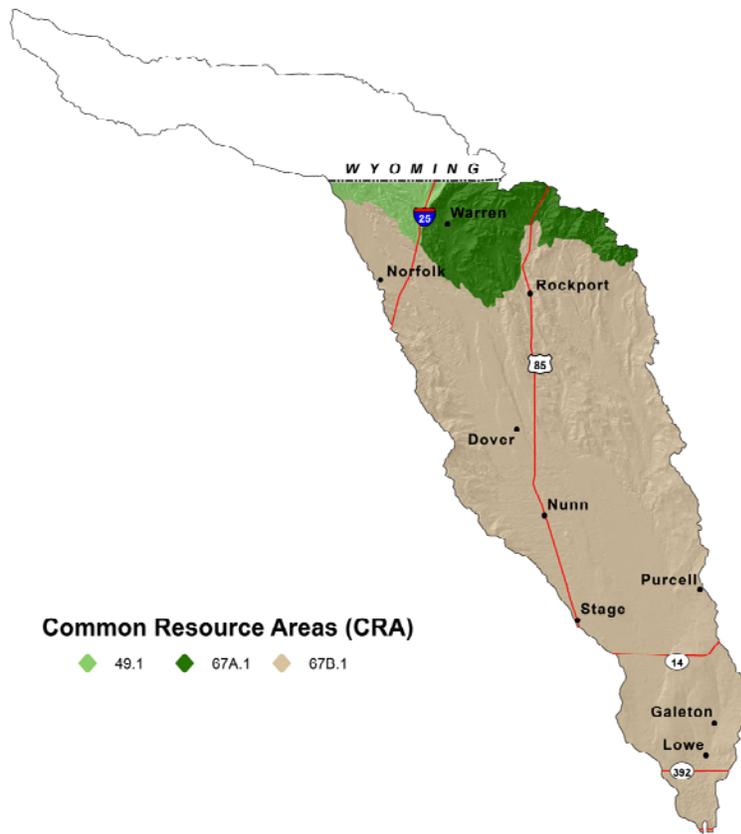
County	County Acres	County Acres in LONE TREE OWL Watershed	% of County in the Watershed	% of Watershed in the County
Larimer	1,684,151	14,840	0.9%	5.2%
Weld	2,568,823	268,981	10.5%	95.0%

Total Watershed Acres 283,042

### Lone Tree Owl Watershed - 10190008

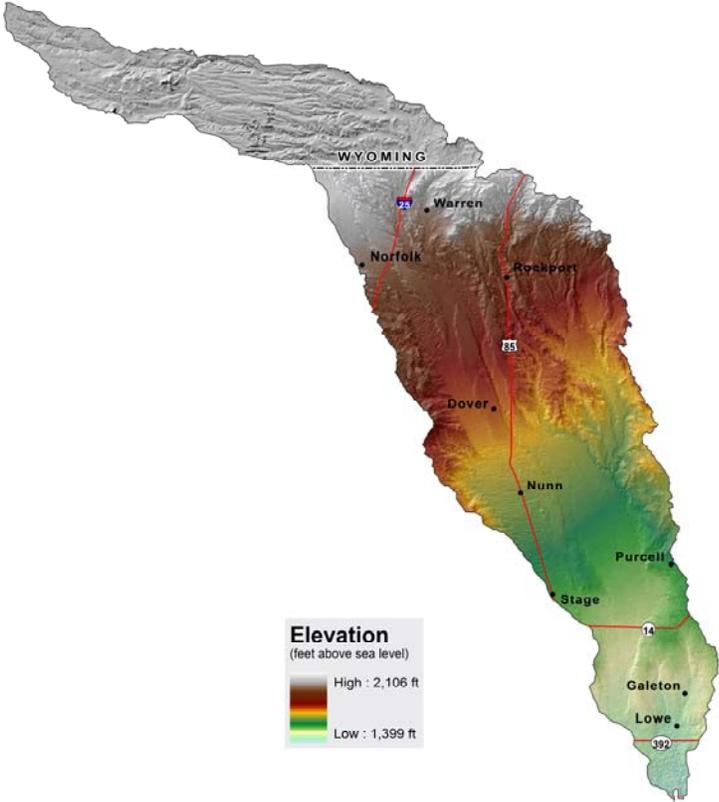


Satellite Imagery: Arc IMS Server - ESRI Imagery



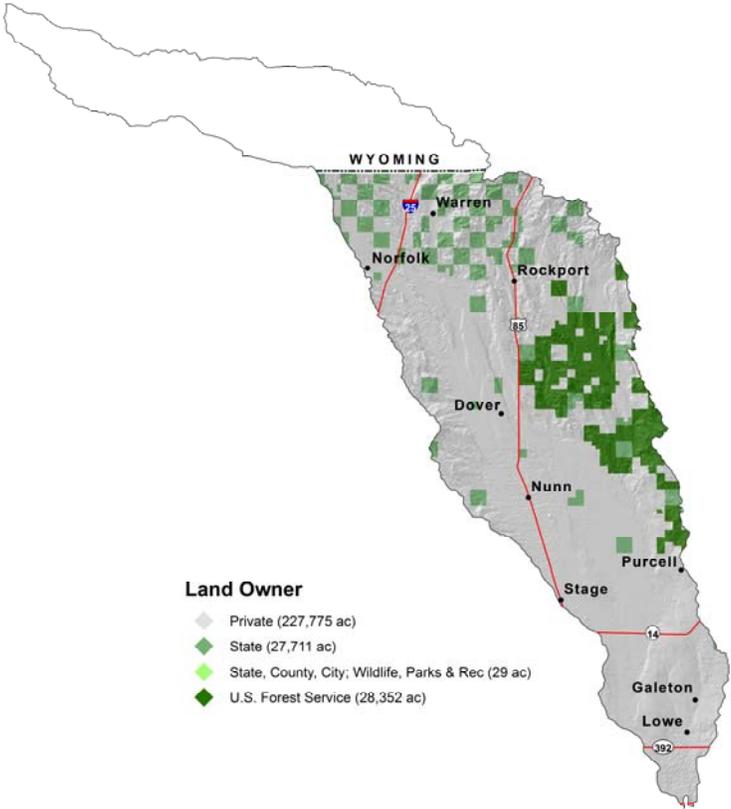
**CRA:** A geographical area where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

MLRA	CRA	CRA NAME	CRA DESCRIPTION
49	<b>49.1</b>	Southern Rocky Mountain Foothills	This area is generally a transition between the Great Plains and the Southern Rocky Mountains. The temperature regime is mesic or frigid, and moisture regime is ustic. Characteristic native vegetation ranges from grasslands and shrubs to ponderosa pine and Rocky Mountain Douglas fir forest.
67A	<b>67A.1</b>	Central High Plains, Northern Part	The Central High Plains, Northern Part CRA is broad, undulating to rolling plains dissected by streams and rivers. Local relief is measured in tens of feet on the plains. Soils are deep and formed in eolian and alluvial materials. Presettlement vegetation was short grass prairies. About one-fourth is dry-farmed to wheat and other grains or is irrigated to corn, alfalfa, beans or sugar beets. Mean annual precipitation is 325 to 425 mm. Mean annual air temperature is 7 to 10°C. Average frost-free period is 100 to 120 days.
67B	<b>67B.1</b>	Central Great Plains, Southern Part	The Central High Plains, Southern Part CRA is broad, undulating to rolling plains dissected by streams and rivers. Local relief is measured in tens of feet on the plains. Soils are deep and formed in eolian and alluvial materials. Presettlement vegetation was short grass prairies. Nearly all of this area in fallow cropland rotations or rangeland. Some cropland areas are irrigated.



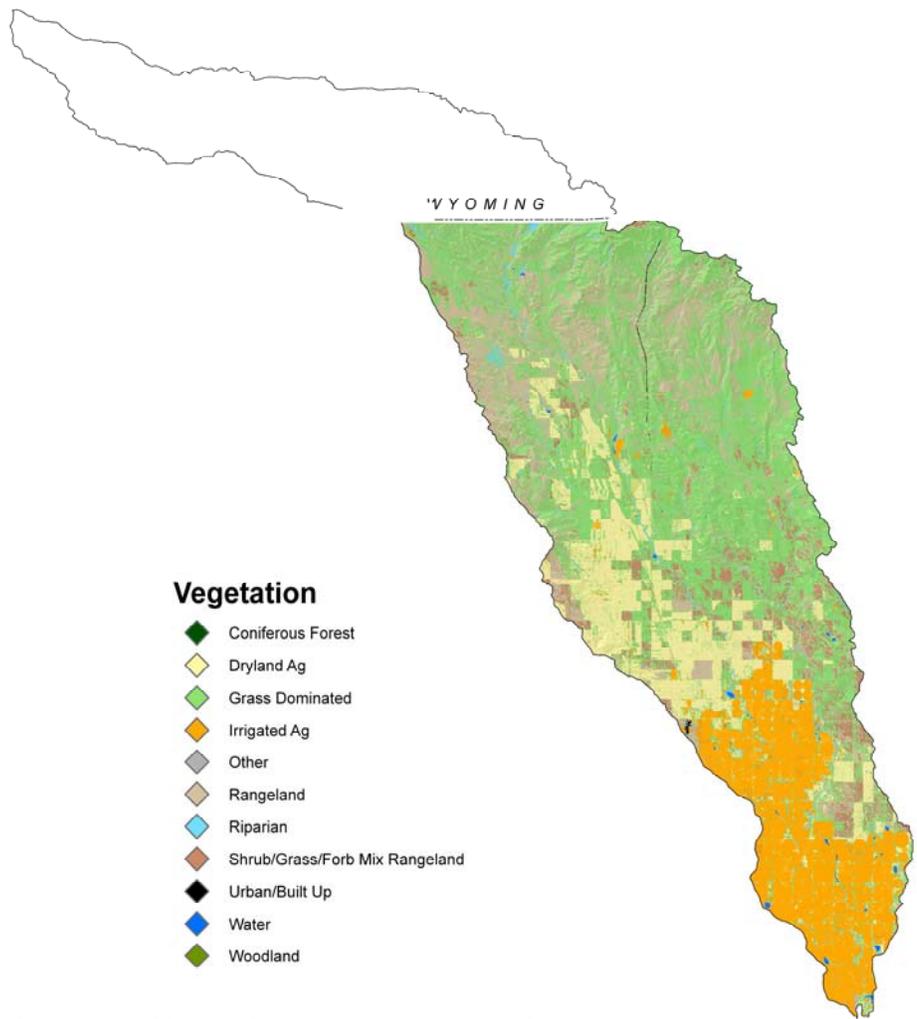
**Elevation**  
(feet above sea level)

High : 2,106 ft  
Low : 1,399 ft



**Land Owner**

- Private (227,775 ac)
- State (27,711 ac)
- State, County, City; Wildlife, Parks & Rec (29 ac)
- U.S. Forest Service (28,352 ac)

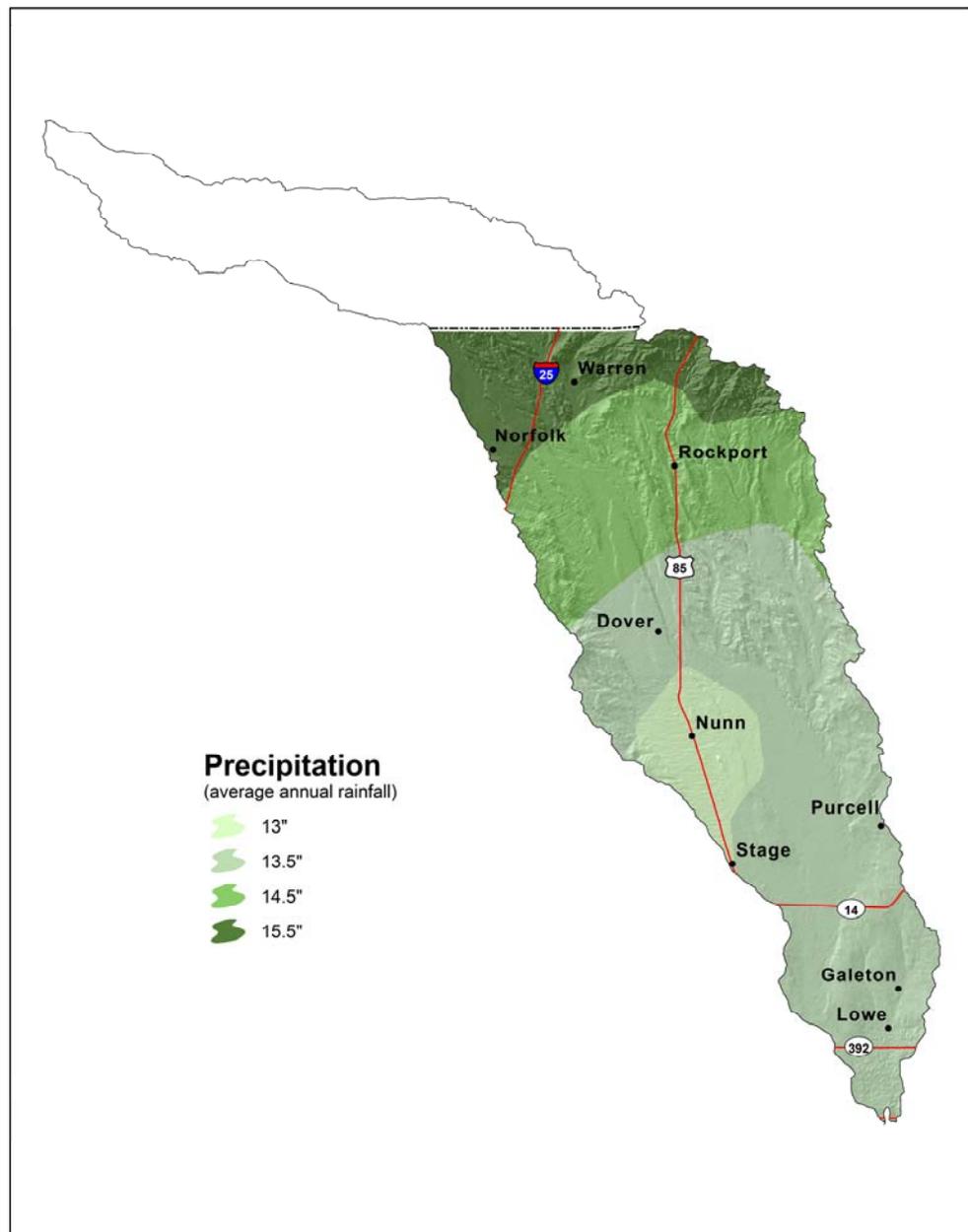


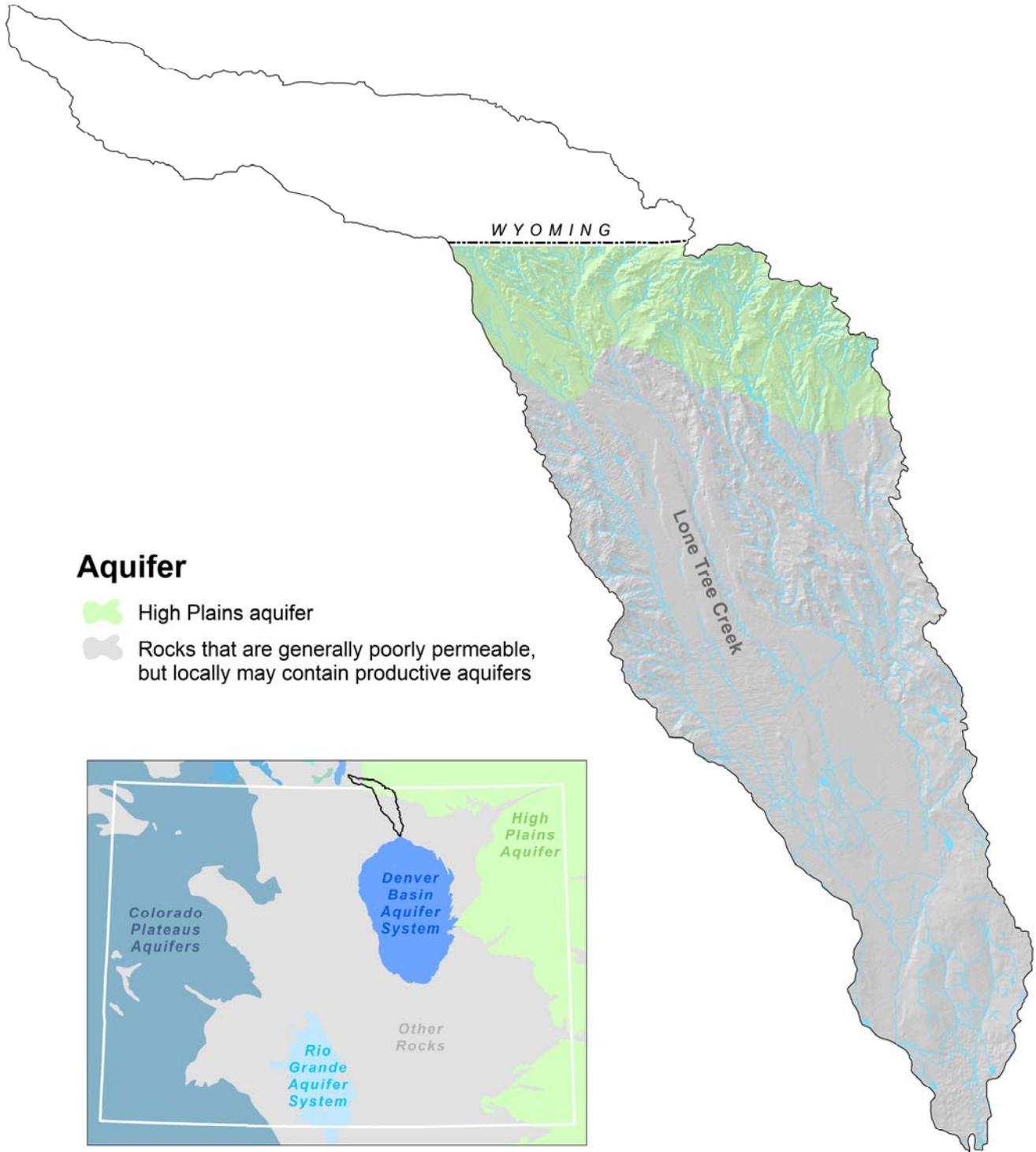
LONE TREE OWL Land Use	Total Acreage	Vegetation	Acreage
Cropland	82,910	Dryland Ag	41,243.83
		Irrigated Ag*	41,666.00
Rangeland/Grassland	193,614	Grass Dominated	130,462.11
		Grass/Forb Mix	47,985.43
		Grass/Misc. Cactus Mix	2,507.35
		Mesic Mountain Shrub Mix	107.73
		Sagebrush/Grass Mix	45.54
		Shrub/Grass/Forb Mix	11,925.95
		Sparse Grass (Blowouts)	556.20
		Xeric Mountain Shrub Mix	23.67
Forest	1,000	Cottonwood	998.00
		Ponderosa Pine	1.67
Riparian	2,867	Forested Riparian	21.94
		Herbaceous Riparian	1,071.69
		Riparian	1,773.12
Water	609	Water	608.68
Other	3,357	Barren Land	2,736.97
		Residential	37.08
		Soil	379.78
		Urban/Built Up	202.80

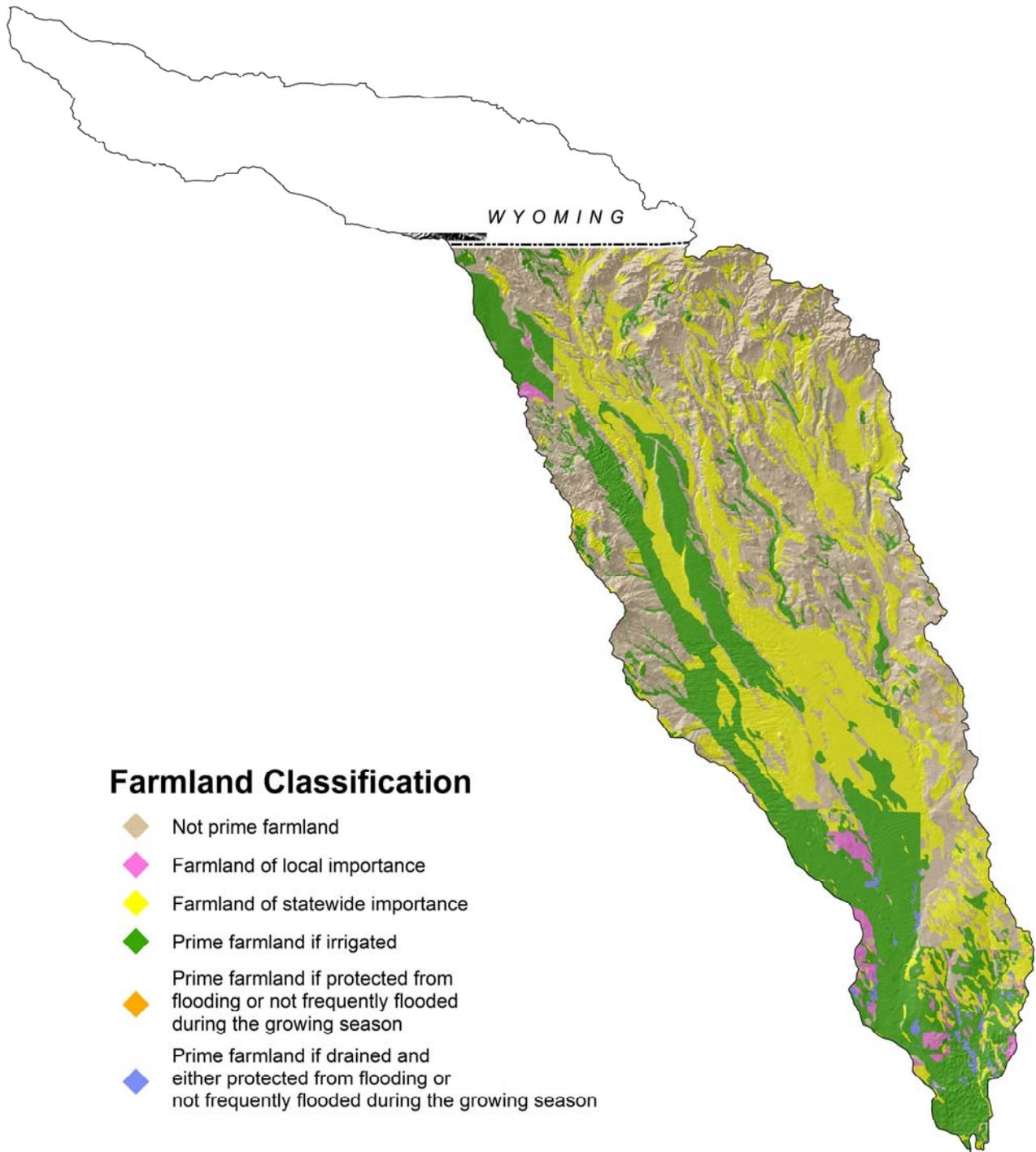
## Precipitation

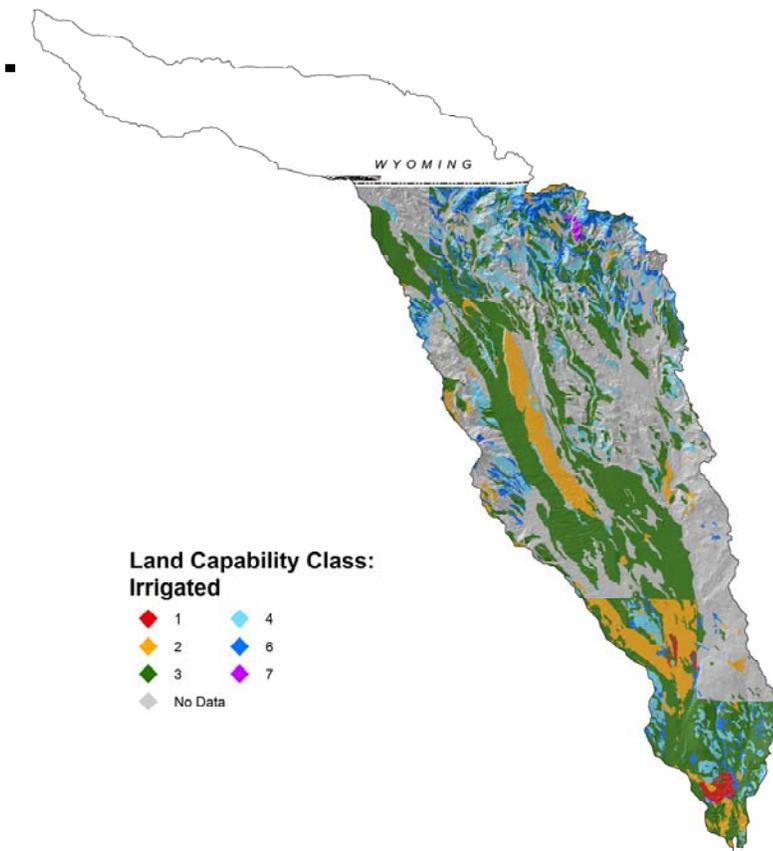
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series 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.

The average annual temperature varies between 48°F and 51°F degrees and ranges between 46°F and 54°F. July is warmest month while December and January are the coolest months. It is not uncommon for the temperatures to reach 100°F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds that produce extreme cold temperatures dropping to -35°F or lower. Winds average about 9 to 10 miles per hour annually with daytime winds that are generally stronger than nighttime and occasional strong storms bring periods of high winds with gusts greater than 50 to 90 miles per hour. Rainfall occurs as frontal storms in the spring and early summer and high intensity, convective thunderstorms in late summer. Approximately seventy-five percent of annual precipitation occurs from mid-April through late September. The mean average annual precipitation ranges from 12 to 18 inches per year and ranges from 6 inches to over 29 inches. Precipitation in winter is snow. The average snowfall ranges from 20 inches to 49 inches but ranges between 4 and 84 inches. The frost free period averages 142 days but ranges from 129 to 155 days. The average date of first frost is in the fall is September 28 and the last frost in the spring is about May 9.









### Land Capability Classes

**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.

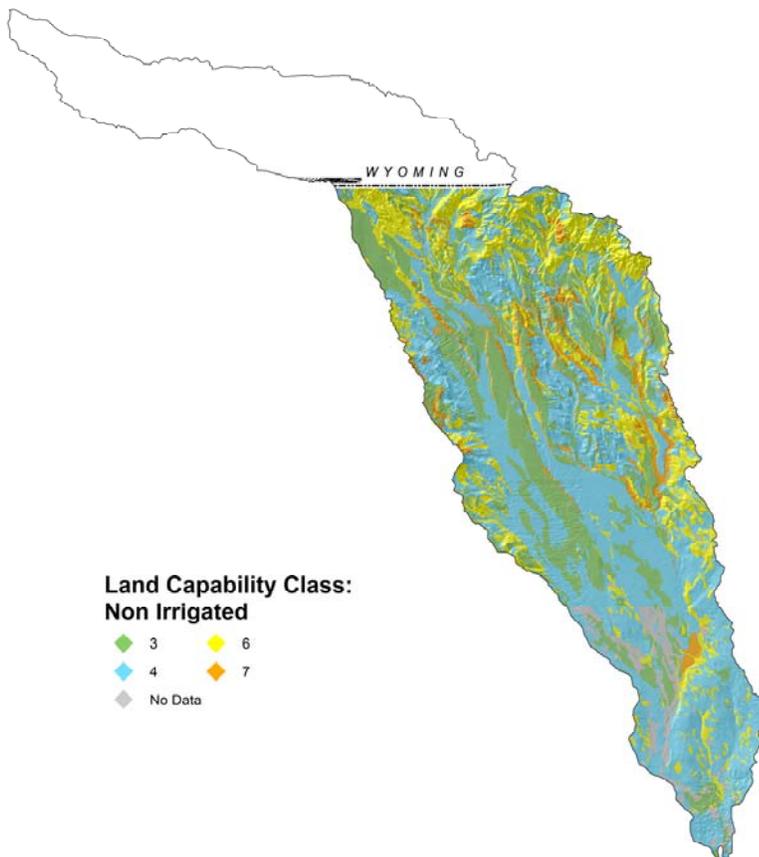
**Class 4** - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

**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.

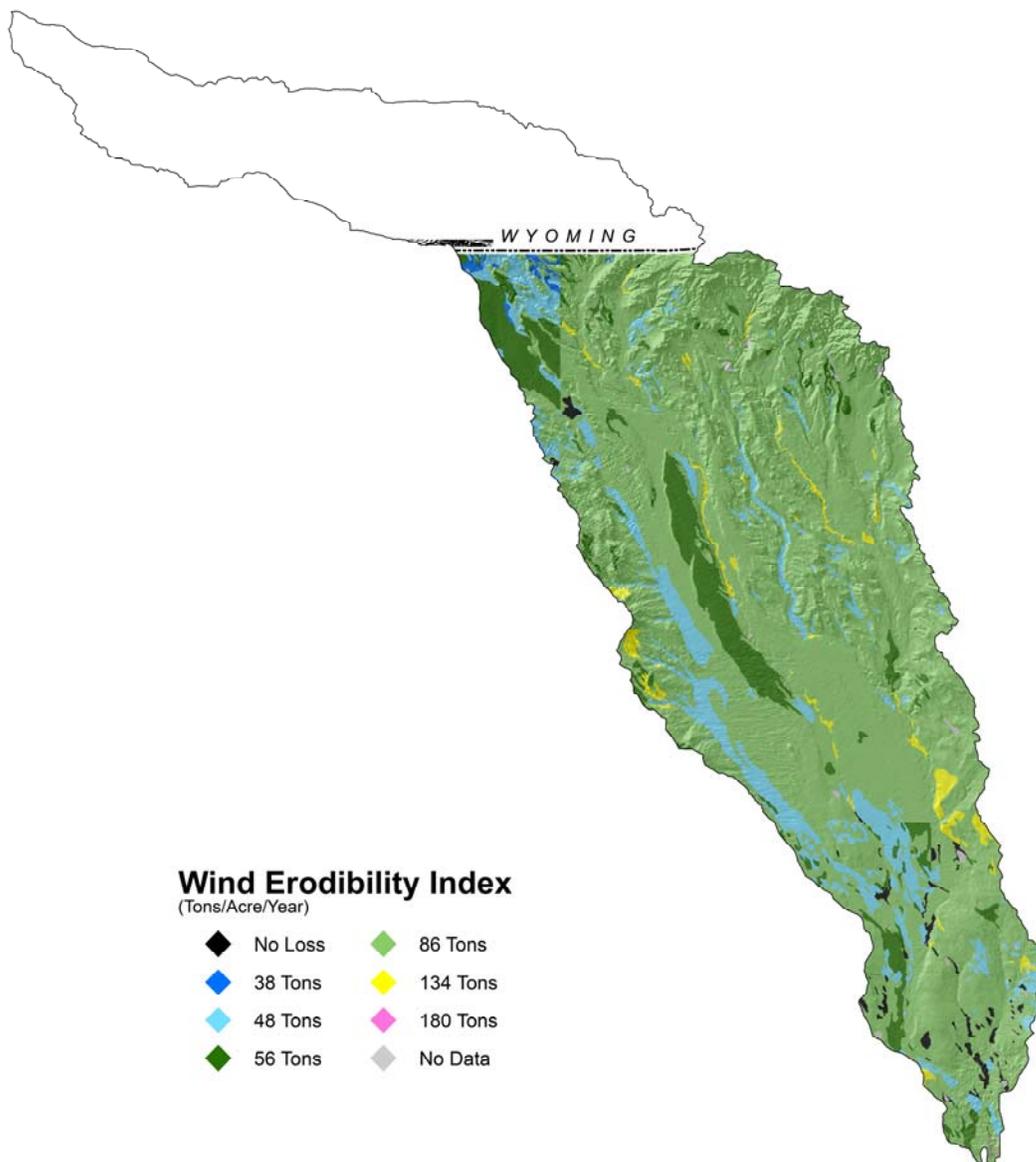


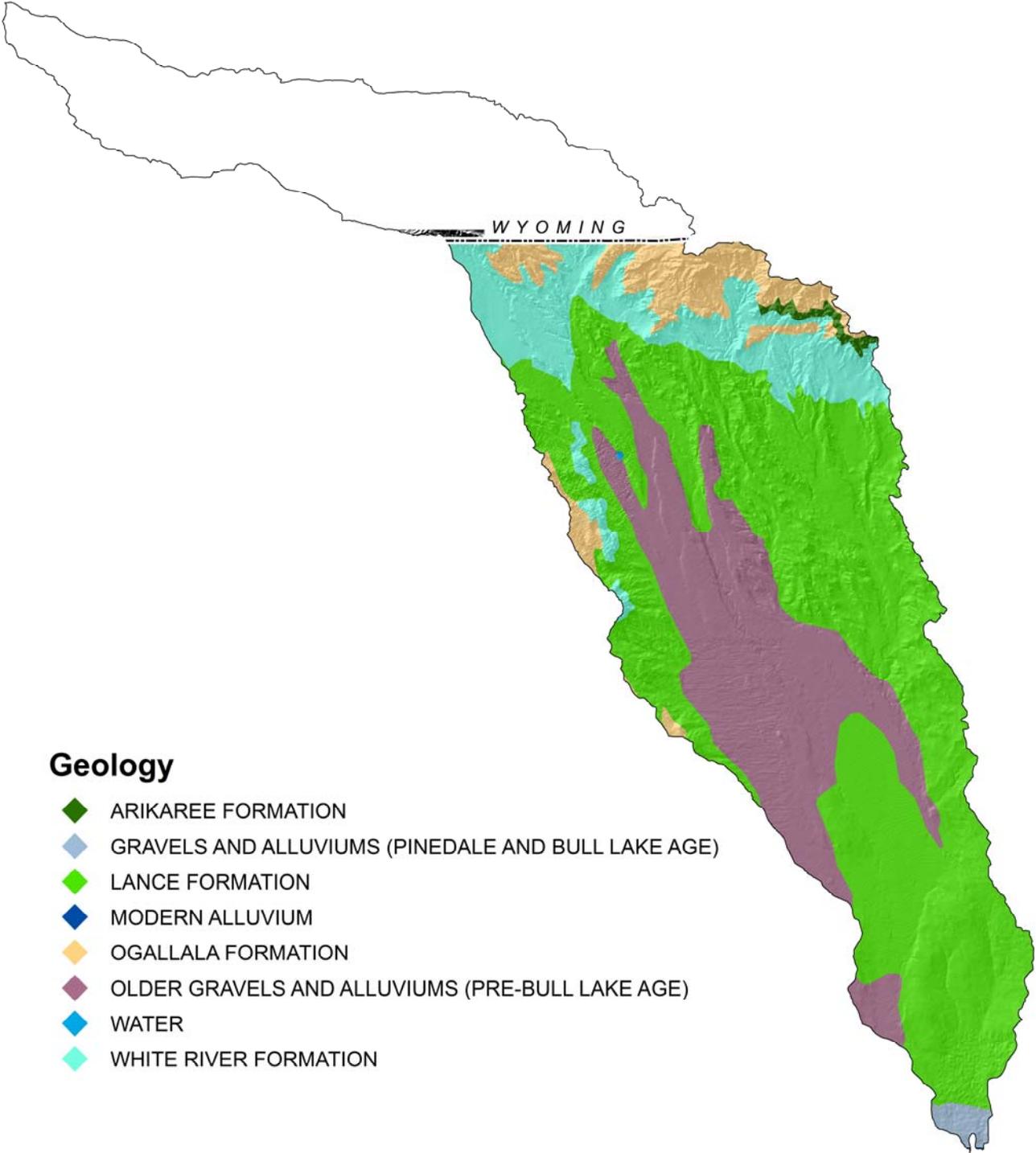
**The Wind Erodibility Index (WEI):**

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.

As shown on the Wind Erodibility Index map below, most cropland soils in the Lone Tree—Owl Watershed are considered highly erodible.





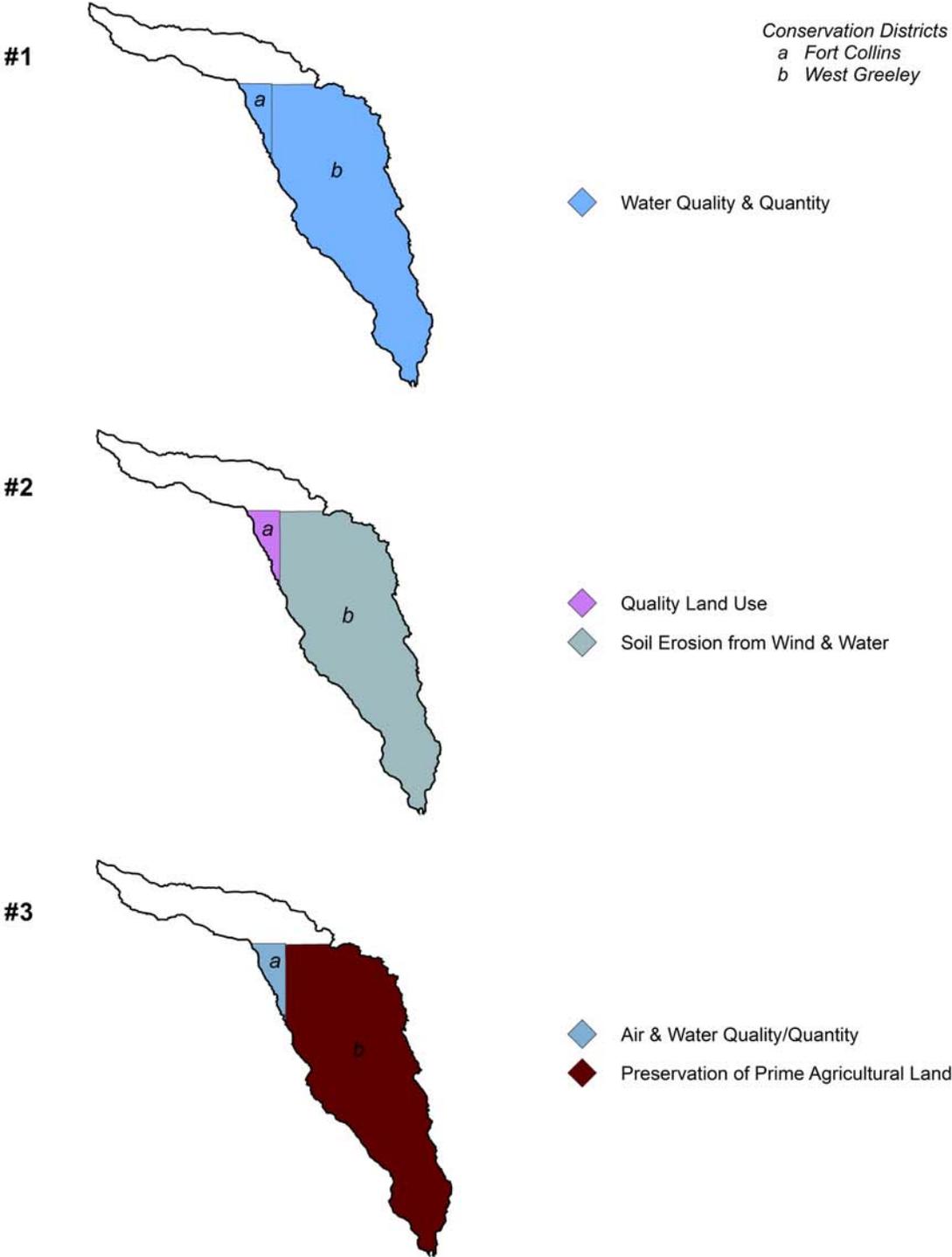
State & Federally Threatened, Endangered & Candidate Species as well as Species of Special Concern					
Common Name	Scientific Name	Class	State Status	Federal Status	Comments
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	Mammals	Concern	None	Occurs in the watershed
Brassy Minnow	<i>Hybognathus hankinsoni</i>	Fish	Threatened	None	Occurs in the watershed
Burrowing Owl	<i>Athene cunicularia</i>	Birds	Threatened	None	Occurs in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern	None	Occurs in the watershed
Iowa Darter	<i>Etheostama exile</i>	Fish	Concern	None	Occurs in the watershed
Least Tern	<i>Sterna antillarum</i>	Birds	Endangered	Endangered	Occurs downstream of watershed; Depletions are a concern here.
Mountain Plover	<i>Charadrius montanus</i>	Birds	Concern	None	Occurs in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibians	Concern	None	Occurs in the watershed
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Fish	None	Endangered	Occurs downstream of watershed; Depletions are a concern here.
Piping Plover	<i>Charadrius melodus</i>	Birds	Threatened	Threatened	Occurs downstream of watershed; Depletions are a concern here.
Preble's Meadow Jumping Mouse	<i>Zapus hudsonius preblei</i>	Mammals	Threatened	Threatened	Occurs in the watershed
River Otter	<i>Lontra Canadensis</i>	Mammals	Threatened	None	May occur along the Platte River
Whooping Crane	<i>Grus Americana</i>	Birds	Endangered	Endangered	Occurs downstream of watershed; Depletions are a concern here.

Short and mid-grass prairie are the primary non-cropland terrestrial habitat types in this watershed. Both irrigated and dry cropland are common in the watershed. Water is somewhat scarce and the native species in this watershed are those that can survive without abundant water supplies. Riparian areas, playa lakes, and stock ponds provide aquatic habitats. Economically important wildlife species that occur in much of the watershed include black bullhead, green sunfish, mule and/or white-tailed deer, pronghorn, and mourning dove. Wild turkey occur in a limited area near the confluence with the South Platte River. Pheasants and snow geese use the southern half of the watershed. Pronghorn (antelope) occur in the eastern half of the watershed. Mountain lion are found in the northern part of the watershed.

<b>Social Data</b>	<b>Larimer</b>	<b>Weld</b>
<b>Demographics (US Census, American Factfinder)</b>		
Total population	264,807	223,966
Male	133,444	112,848
Female	131,363	111,118
Median age (years)	33.9	31.3
White	243,945	200,942
Black or African American	1636	754
American Indian and Alaska Native	1077	1465
Asian	4451	2427
Native Hawaiian and Other Pacific Islander	201	117
Some other race	5934	14814
Hispanic or Latino (of any race)	25319	62792
<b>Economic Characteristics (US Census, American Factfinder)</b>		
In labor force (population 16 years and over)	154,222	120,817
Median household income (dollars)	48,686	48,763
Median family income (dollars)	64,088	57,009
Per capita income (dollars)	26,963	21,981
Families below poverty level	x	x
Individuals below poverty level	x	x
X means that value is not applicable or not available		
<b>County Agricultural Characteristics (Colorado Agricultural Census, county data tables)</b>		
Farms (number)	1564	3121
Land in farms/ranches (acres)	521,599	1,812,167
Average size farm/ranch (acres)	334	581
Median size farm (acres)	40	158
Average age of farmer or rancher	52.9	53.5
Net cash return from ag sales (\$1,000)	124	67,959
Cattle and calves (number)	40,000	505,000

# Identified Long Range Resource Concerns

## Top Three Concerns within Conservation Districts



## Selected Conservation Application Data

Practices	FY 2004	FY 2005	FY 2006	FY 2007	Total
Irrigation Water Management (ac)	0	73	352	267	692
Prescribed Grazing (ac)	30,346	2,530	0	155	33,723
Conservation Crop Rotation (ac)	0	404	537	0	941

## Conservation Systems to Address Major Resource Concerns

Primary Resource Concern: Rangeland Health				
Conservation System Description:		Prescribed Grazing—planned management that provides adequate recovery opportunity between grazing events and proper stocking of animals. Estimate 85,000 acres need to be treated on median sized ranches of 2,350 acres.		Reference Conservation System Guide Code: <a href="#">CO 67B.1-GR-01-R-Grazing</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost per Median Sized Ranch (\$)
Prescribed Grazing				
Fence (382)	Ft.	12,400	0.7	8,680
Pest Management (595)	500 Ac.	1	4,500	4,500
Pipeline (516)	Ft.	10,000	1.45	14,500
Upland Wildlife Habitat Management (645)	Ac.	300	na	0
Watering Facility (614)	No.	4	800	3,200
Range Planting (550)	Ac.	10,000	1.45	10,608
Costs to apply prescribed grazing per median sized ranch of 2,350 acres	No.	36		41,488

Subtotal Rangeland costs: \$1,493,568

### Conservation Systems to Address Major Resource Concerns (cont'd)

Primary Resource Concern: Water Quality				
Conservation System Description:		Upgrading Sprinkler irrigation system with IWM, Crop rotation, Nutrient and Pest Mgt.		Reference Conservation System Guide Code: <a href="#">CO 67B.1-CR-Pivot-R-1.1</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation Water Management (449)* * includes re-bowl, renozzle, and IWM	Ac	5,000	34.20	171,000
Nutrient Management (590)	Ac	10,000	15	150,000
Pest Management (595)	Ac	10,000	15	150,000
Conservation System Description:		Surface irrigation converted to sprinkler system. Sprinkler irrigation system with IWM, Crop rotation, Nutrient and Pest Mgt.		Reference Conservation System Guide Code: <a href="#">CO 67B.1-CR-Pivot</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation System, Sprinkler (442)	Ac	2,000	600	1,200,000
Irrigation Water Management (449)	Ac	17,000	5	85,000
Nutrient Management (590)	Ac	17,000	11.5	195,500
Pest Management (595)	Ac	17,000	15	255,000
<b>Subtotal Irrigated Crops:</b>				<b>\$2,206,500</b>

Primary Resource Concern: Soil Erosion By Wind on Dryland Crops				
Conservation System Description:		Seasonal residue management with Conservation crop rotation, Nutrient and Pest Mgt		Reference Conservation System Guide Code: <a href="#">CO 67B.1-CR-Dryland-R-2</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Residue Mgmt (344)	Ac	18,150	5	90,750
Nutrient Management (590)	Ac	18,150	5	90,750
Pest Management (595)	Ac	18,150	15	272,250
Conservation Cover (327)	Ft	25,000	3.5	87,500
<b>Subtotal Costs Dryland Crops:</b>				<b>\$ 541,250</b>

### General Effects, Impacts, and Estimated Costs of Application of Conservation Systems

Landuse	Resource Concern	Measurable Effects	Non-measurable Effects	Estimated Cost (\$)
Rangeland	Plants		Improved plant condition, productivity, health and vigor. Grazing animals have adequate feed, forage, and shelter. Wildlife habitat is sustained or improved.	1,493,568
Irrigated Crop	Water		Efficiency of water use. Salt load reduction.	2,206,500
Dryland Crop	Soil	1,026,675 Total Tons/ Year saved	Cropland sustainability	541,250
Estimated Total Costs to Address Major Resource Concerns: \$4,241,318				

## 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.cdphe.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>.

**Resource Concerns** were identified using the Colorado Association of Conservation Districts' (CACD) long range (10 year) plans from the period of 1996-2000. 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:

Weld County N (CO617) Published 12/14/2005

Weld County S (CO618) Published 12/14/2005

Larimer County Area (CO644) Published 03/07/2006

**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>.

All border state (if applicable) vegetation data courtesy of the National Land Cover Dataset (NLCD). For more information visit [http://www.mrlc.gov/mrlc2k\\_nlcd.asp](http://www.mrlc.gov/mrlc2k_nlcd.asp)

**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.

**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](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). The data was downloaded from the NRCS Geospatial Data Gateway at <http://datagateway.nrcs.usda.gov>.