



United States Department  
of Agriculture

# Uncompaghre Watershed



Hydrologic Unit Code 14020006

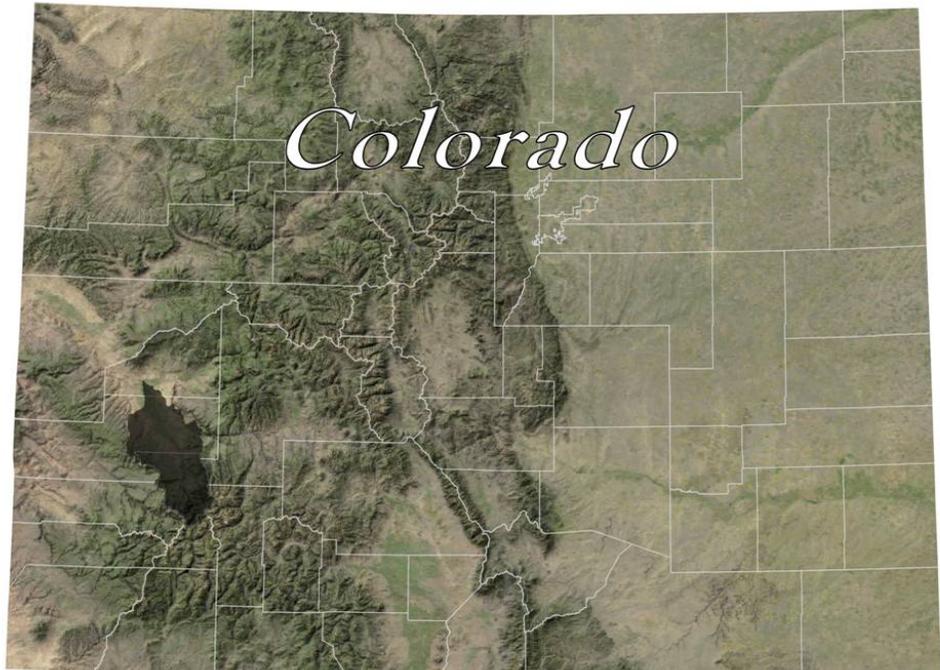
Natural Resources  
Conservation Service

## Rapid Assessment

Lakewood, Colorado

RWA 14020006

December 2009



Satellite Imagery: ArcIMS Server - Geographic Network Services hosted by ESRI



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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

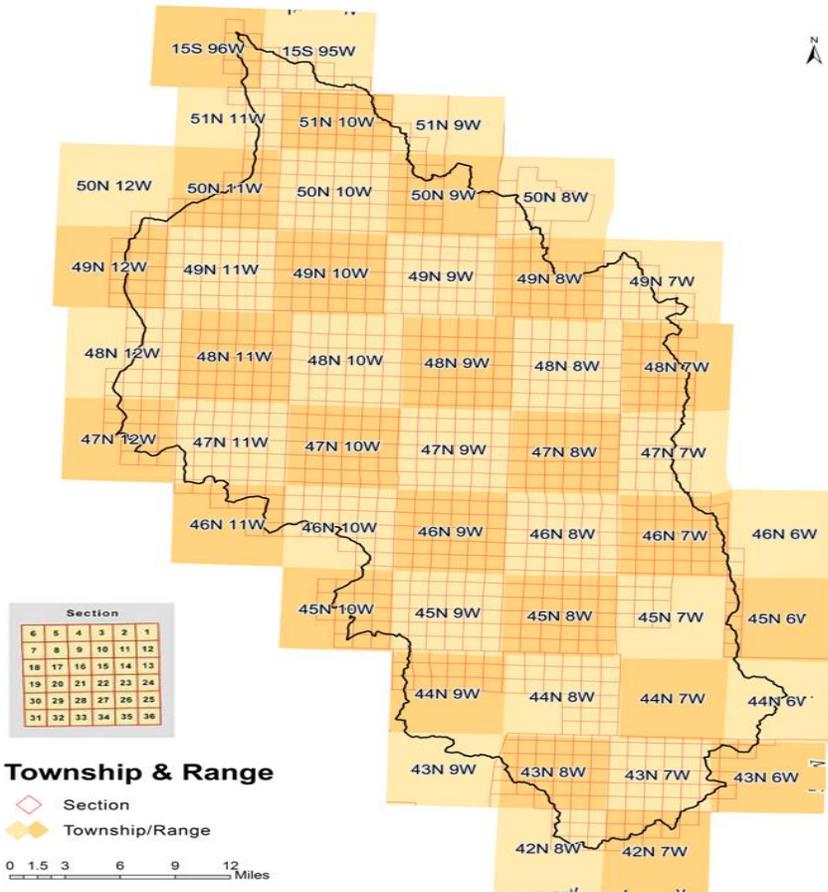
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

- 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.

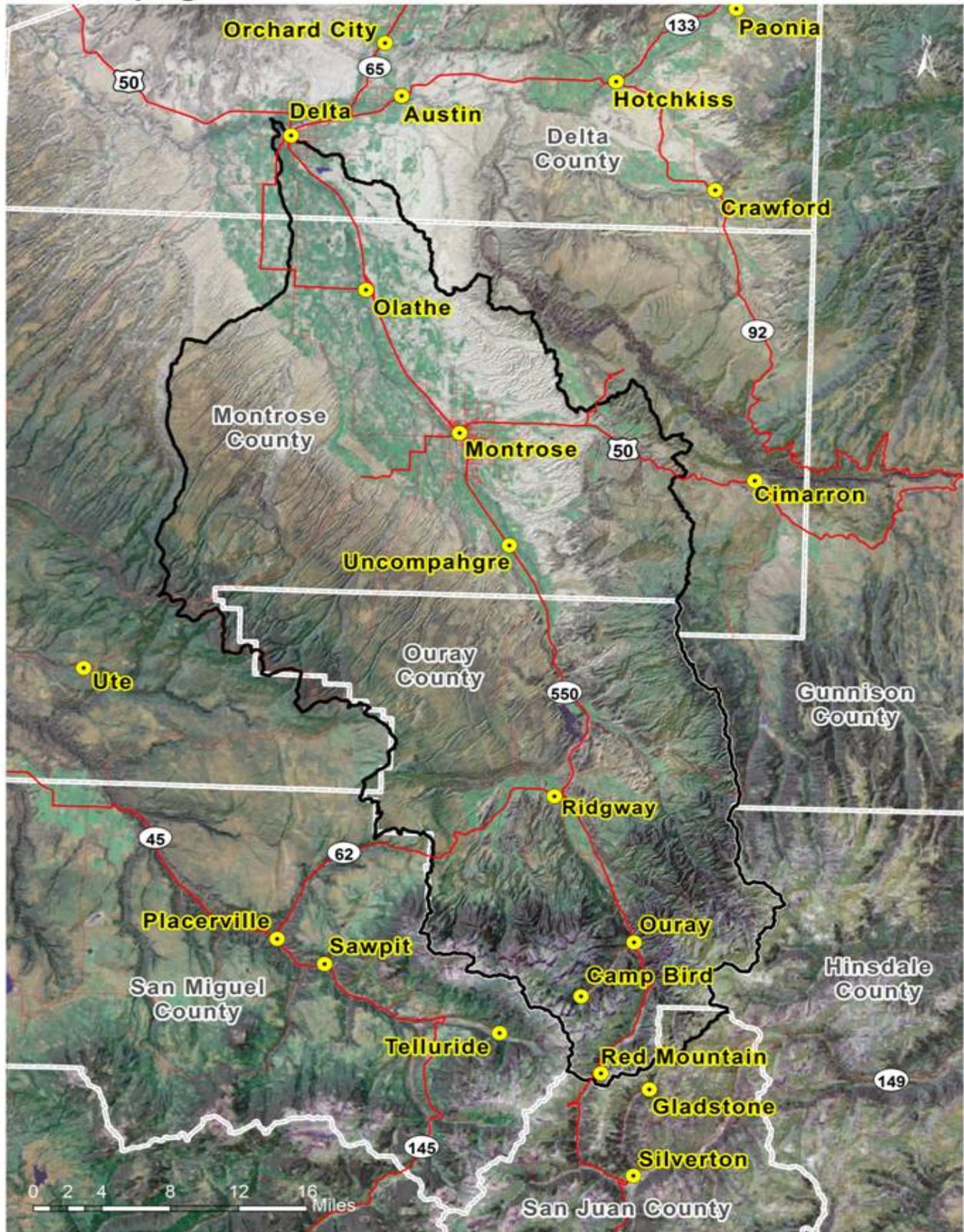
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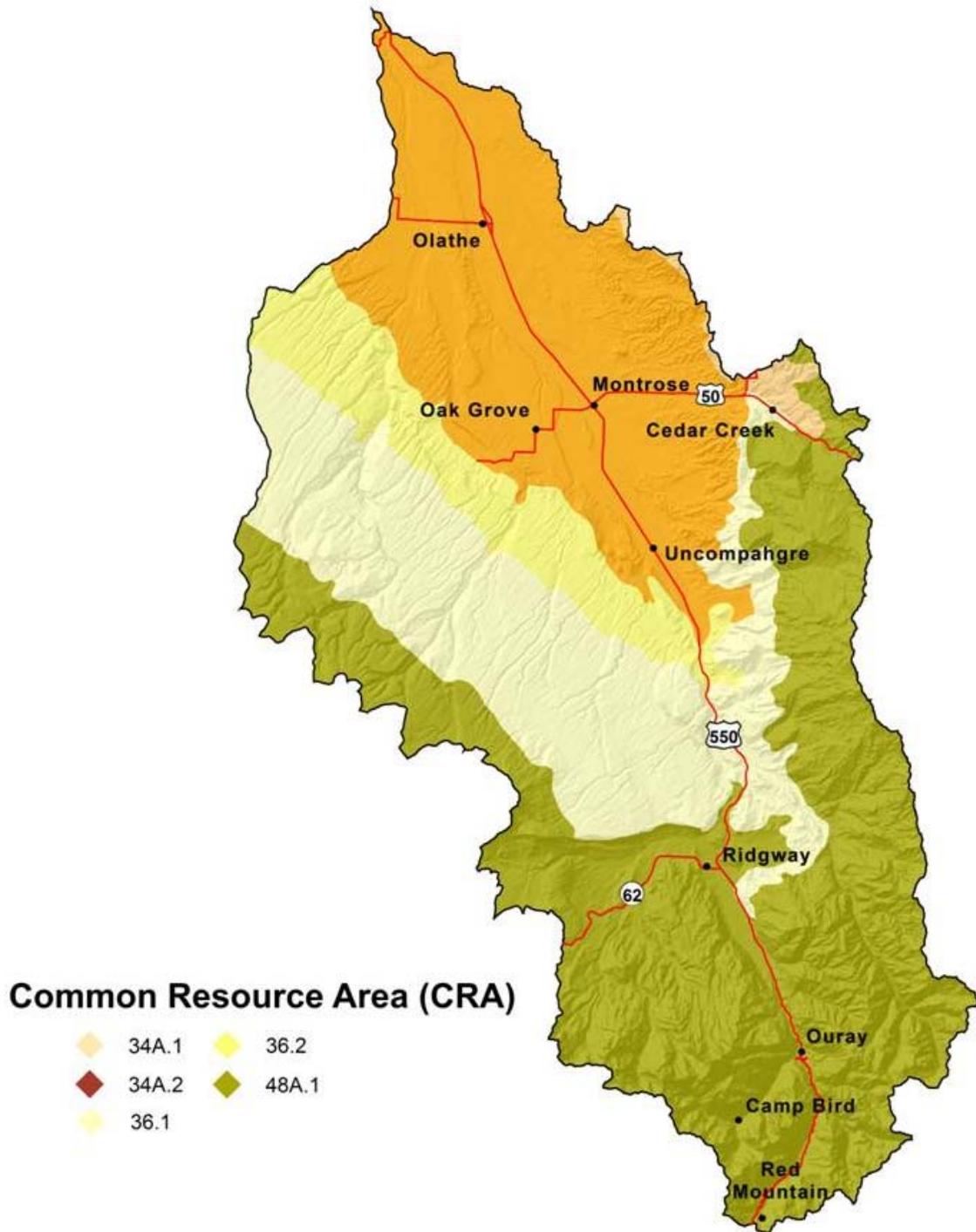
County	County Acres	County Acres in UNCOMPAGHRE Watershed	% of County in the Watershed	% of Watershed in the County
Delta	735,674	15,636	2.1%	2.2%
Gunnison	2,085,945	24	0.001%	0.003%
Hinsdale	719,387	44	0.006%	0.006%
Montrose	1,437,265	347,472	24.2%	48.7%
Ouray	347,274	345,664	99.5%	48.4%
San Juan	249,413	4,825	1.9%	0.7%
San Miguel	826,078	211	0.026%	0.030%

713,876

# Uncompahgre Watershed - 14020006

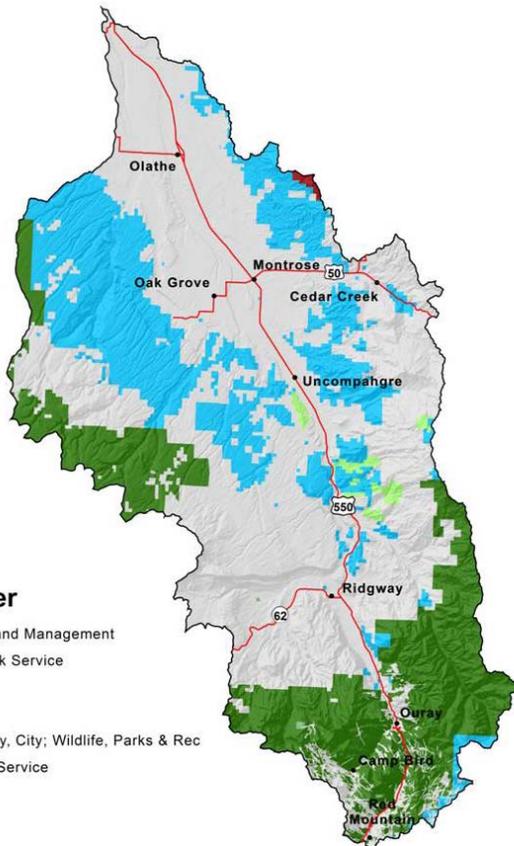
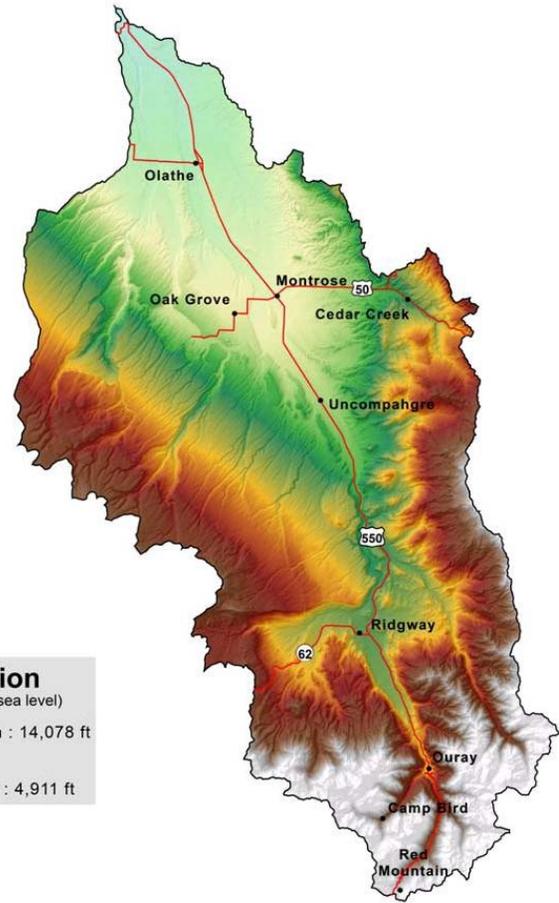


Satellite Imagery: Arc IMS Server - Geography Network Services hosted by ESRI



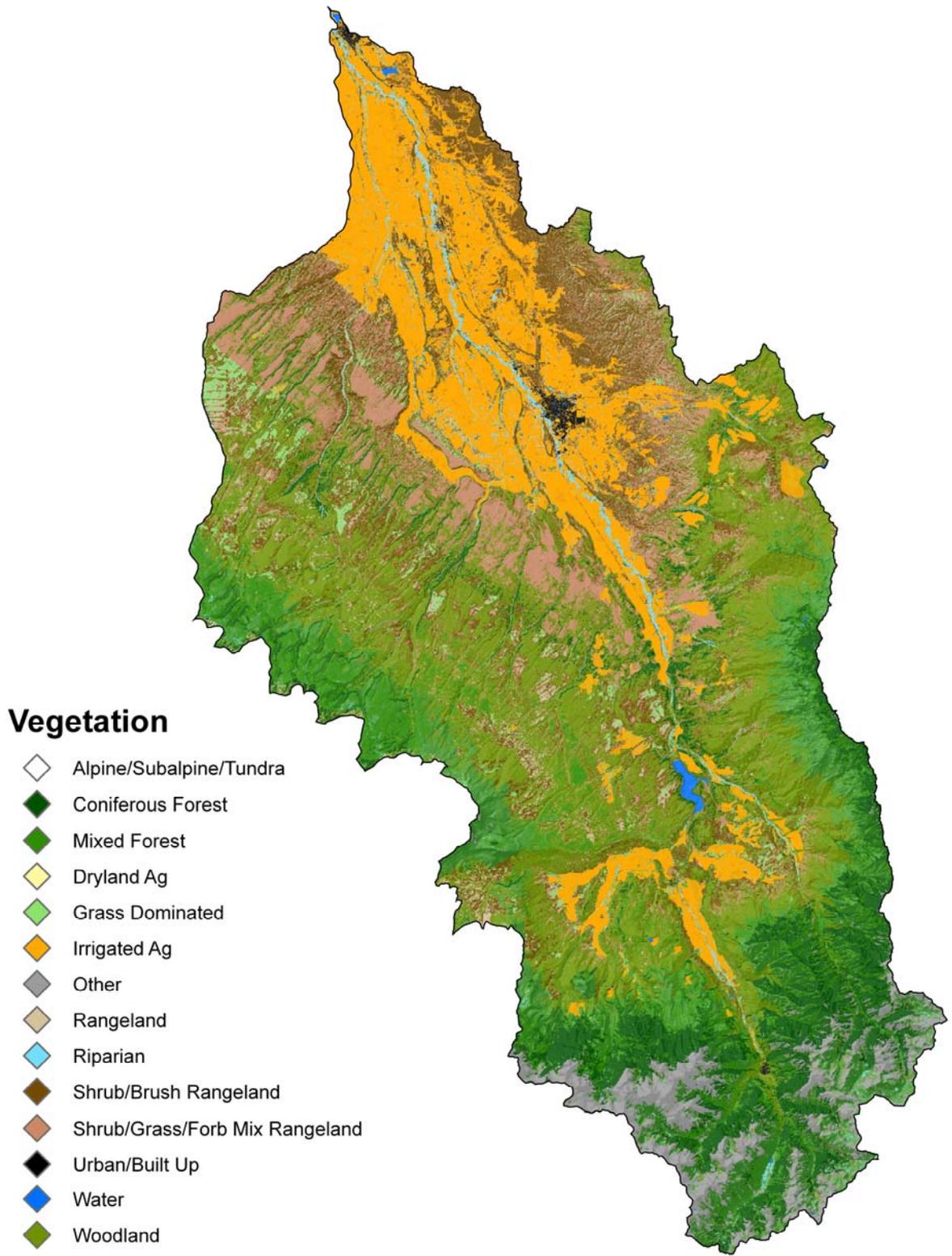
**Common Resource Areas (CRA):** Geographical areas where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

MLRA	CRA	CRA NAME	CRA DESCRIPTION
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.
34B	34B.2	Warm Central Desertic Basins and Plateaus - Uncompahgre and Grand Valleys	This area is in the broad valleys of the Uncompahgre and Colorado Rivers. It includes a sizeable area of irrigated cropland, vineyards, and orchards. The temperature regime is mesic and the moisture regime is aridic (typic aridic subclass). Natural vegetation is typically shadscale, Gardner saltbush, and mat saltbush. Frost free periods are long, in some places more than 180 days.
36	36.1	Southwestern Plateaus, Mesas, and Foothills - Cool Subhumid Mesas and Foothills	This area encompasses the higher elevation mesas and foothills that represent a transition to the Southern Rocky Mountains. The temperature regime is frigid, and the moisture regime is ustic. The typical vegetation is big sagebrush, Gambel oak, and ponderosa pine. Land use is mainly forest and grazing land.
36	36.2	Southwestern Plateaus, Mesas, and Foothills - Warm Semiarid Mesas and Plateaus	This area encompasses the lower elevation mesas and plateaus. The temperature regime is mesic and the moisture regime is transitional from ustic to aridic. Vegetation is typically twoneedle pinyon, Utah juniper, and big sagebrush. Cropland is a significant land use in parts of this area, particularly on soils formed in thick deposits of eolian material. Precipitation ranges from 10 to about 16 inches. Elevations range from about 6,000 to 7,000 feet.
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 14,400 feet.



**Land Owner**

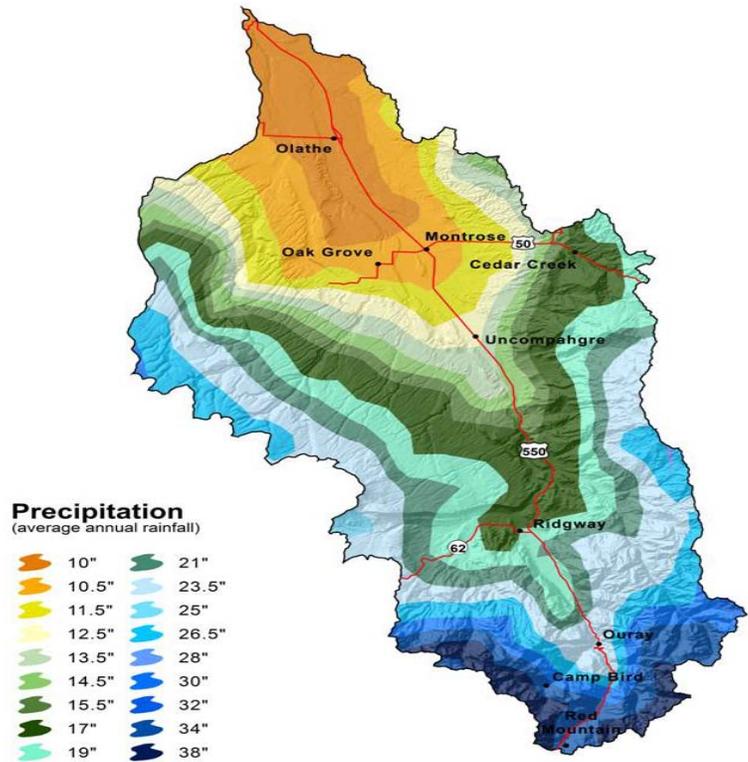
- ◆ Bureau of Land Management
- ◆ National Park Service
- ◆ Private
- ◆ State
- ◆ State, County, City; Wildlife, Parks & Rec
- ◆ U.S. Forest Service



UNCOMPAHGRE	Land Use	Total Acreage	Vegetation	Acreage
	Cropland	97,650	Irrigated Ag	97,643.13
			Alpine Forb Dominated	4,800.96
			Alpine Grass Dominated	301.05
			Alpine Grass/Forb Mix	6,677.38
			Alpine Meadow	1,266.86
			Gambel Oak	36,708.84
			Grass Dominated	23,313.52
			Grass/Forb Mix	7,720.58
			Grass/Forb Rangeland	885.30
			Greasewood	4,044.69
			Mesic Mountain Shrub Mix	53,689.73
	Rangeland/Grassland	316,089	Rangeland	4,490.57
			Sagebrush Community	34,502.36
			Sagebrush/Gambel Oak Mix	10,211.12
			Sagebrush/Grass Mix	55,698.98
			Sagebrush/Mesic Mtn Shrub Mix	9,058.65
			Salt Desert Shrub Community	7,513.44
			Saltbush Community	35,904.97
			Serviceberry/Shrub Mix	941.61
			Shrub Riparian	2,083.55
			Shrub/Grass/Forb Mix	1,636.85
			SubAlpine Shrub Community	2,229.06
			Subalpine Grass/Forb Mix	12,340.17
			Aspen	26,876.74
			Aspen/Mesic Mountain Shrub Mix	5,562.53
			Cottonwood	6,354.89
			Douglas Fir	5,548.04
			Douglas Fir/Aspen Mix	8,741.37
			Englemann Spruce/Fir Mix	44,670.30
			P. Pine/Gambel Oak Mix	5,964.16
			PJ-Mtn Shrub Mix	40,469.21
			PJ-Oak Mix	11,679.83
			PJ-Sagebrush Mix	48,396.14
			Pinon-Juniper	14,076.03
			Ponderosa Pine/Aspen Mix	4,422.70
			Sparse PJ/Shrub/Rock Mix	4,944.25
			Spruce/Fir/Aspen Mix	27,395.00
			Upland Willow/Shrub Mix	2,811.61
			Willow	869.20
	Riparian	10,227	Riparian	10,227.00
	Water	1,491	Water	1,491.12
			Commercial	1,272.98
	Other	39,038	Residential	1,229.50
			Rock and Barren Land	36,527.97
Total Watershed Acres				713,821.56

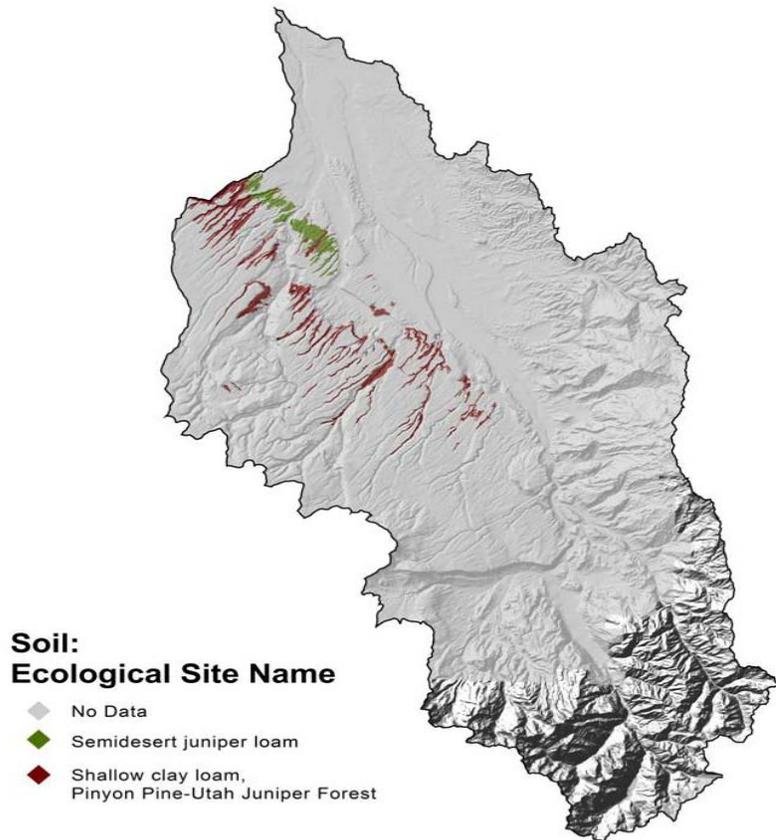
### Precipitation

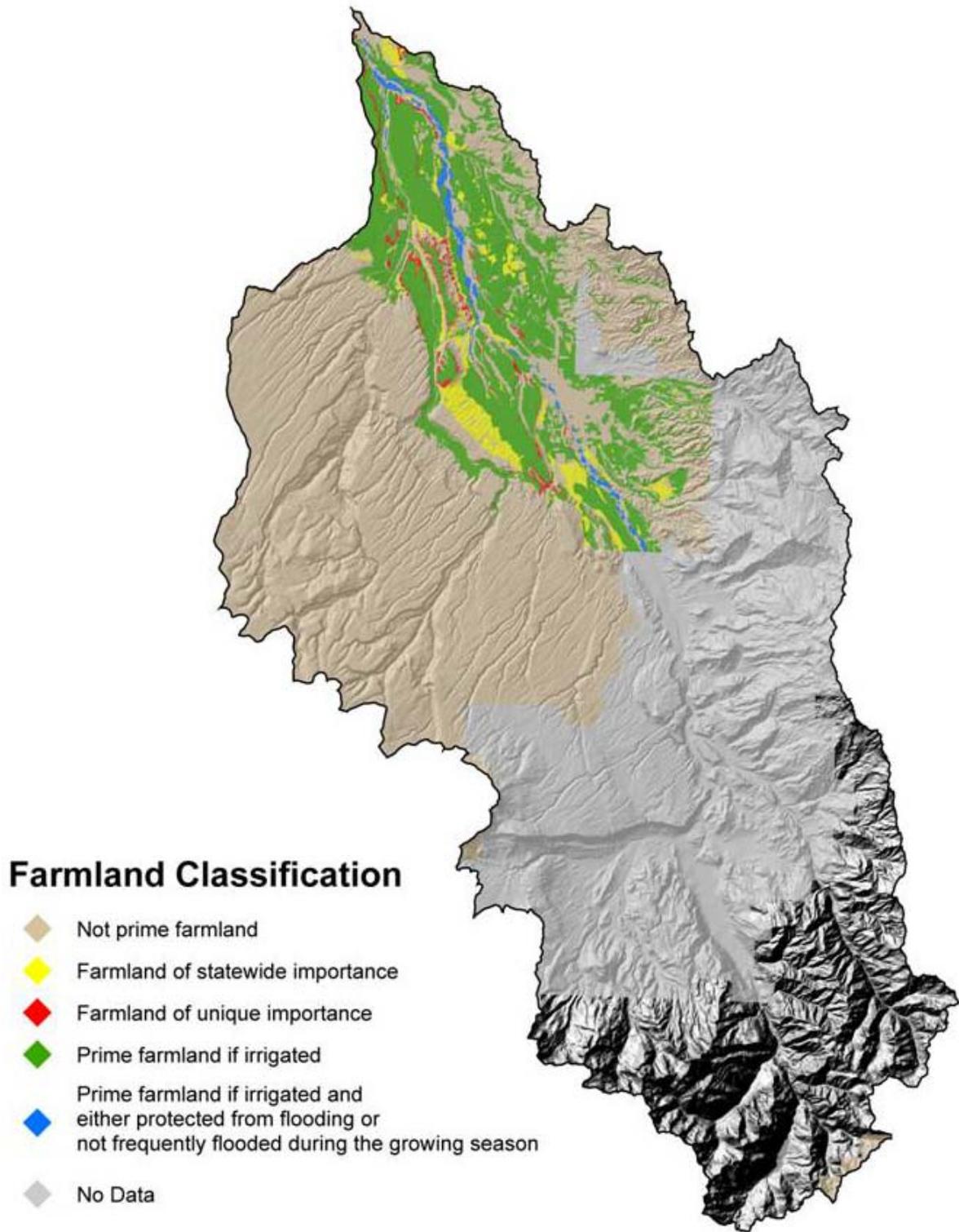
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series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

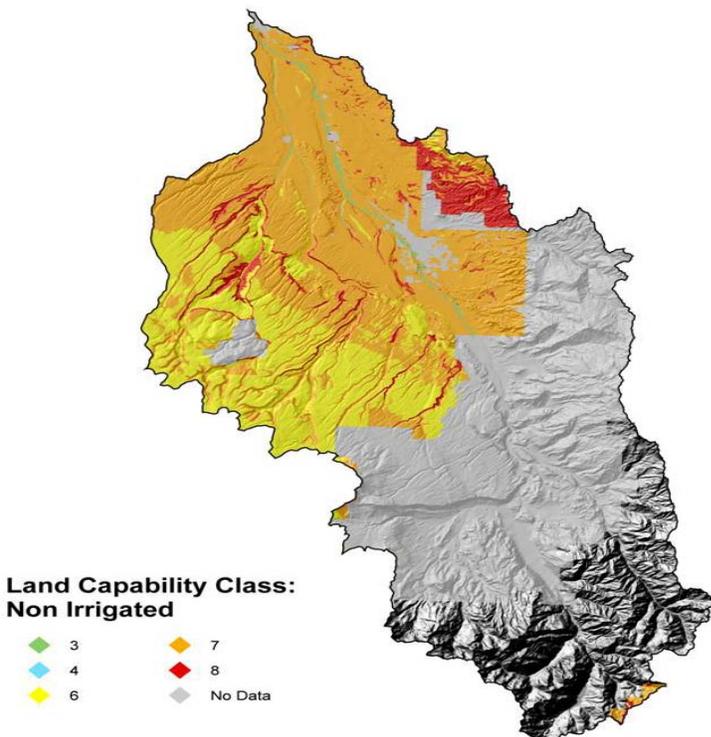
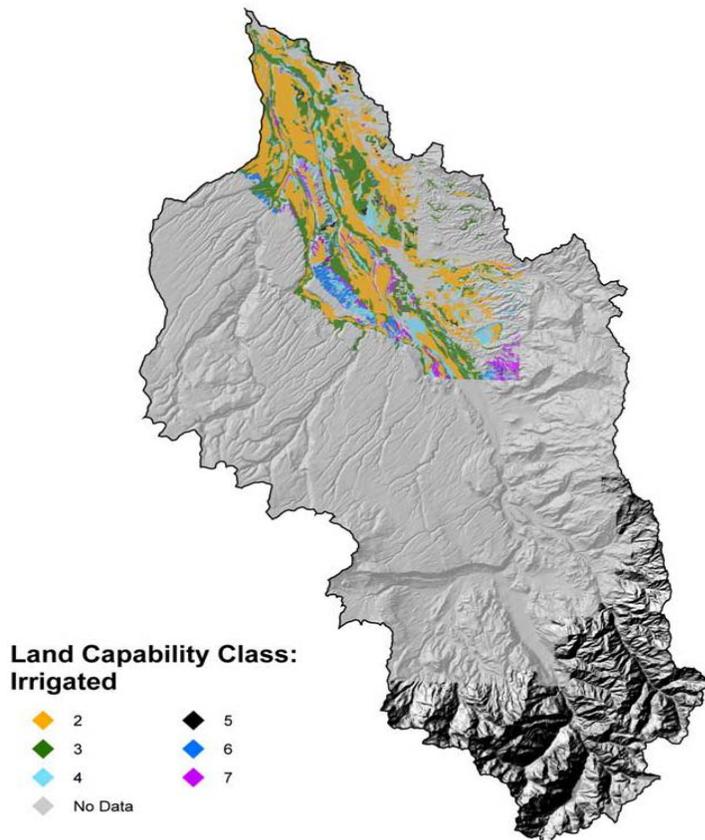


### Ecological Sites

The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Ecological Site maps give an overall indication of the soils plant relationship in the area. More detailed descriptions of ecological sites are provided in the Field Office Technical Guide (FOTG). The FOTG is available in local offices of the Natural Resources Conservation Service (NRCS) and online at <http://www.nrcs.usda.gov/technical/efotg/>.







### 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.

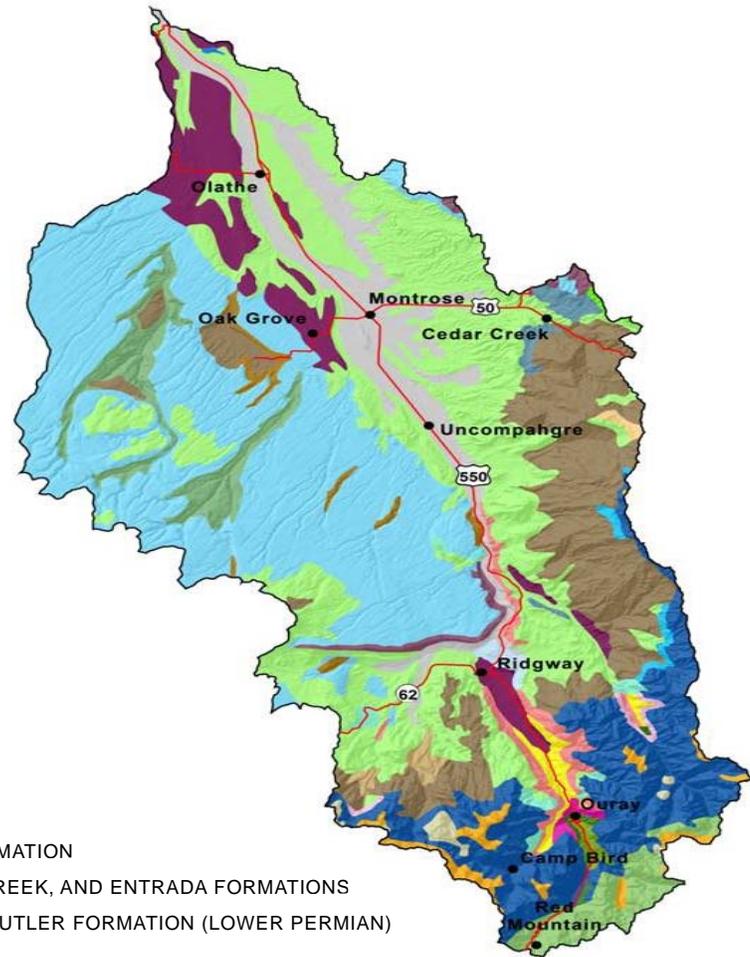
**Class 4** - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

**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.



## Geology

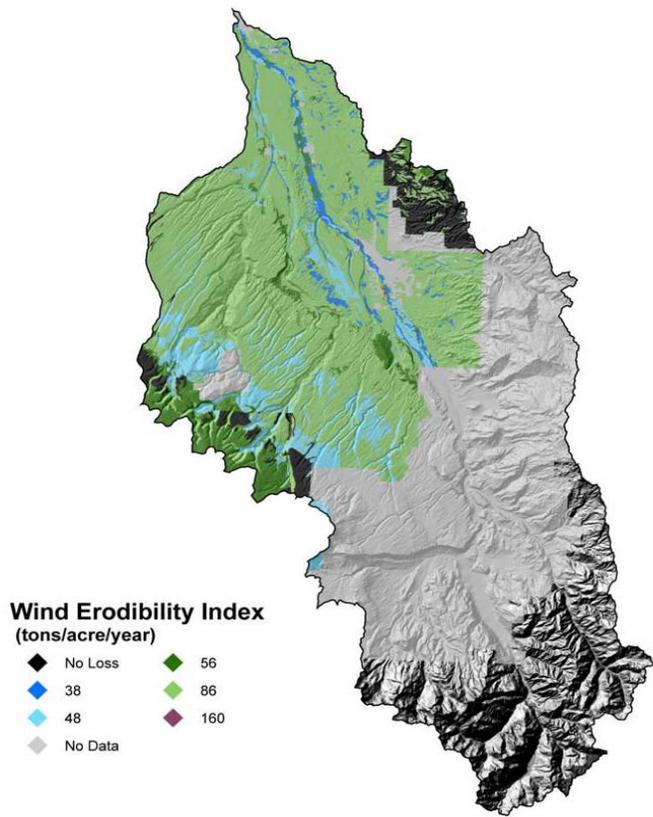
- ◆ ASH-FLOW TUFF OF MAIN VOLCANIC SEQUENCE
- ◆ BIOTITIC GNEISS, SCHIST, AND MIGMATITE
- ◆ DAKOTA SANDSTONE AND BURRO CANYON FORMATION
- ◆ DAKOTA, PURGATOIRE, MORRISON, RALSTON CREEK, AND ENTRADA FORMATIONS
- ◆ DOLORES FORMATION (UPPER TRIASSIC) AND CUTLER FORMATION (LOWER PERMIAN)
- ◆ EOCENE PREVOLCANIC SEDIMENTARY ROCKS
- ◆ GLACIAL DRIFT OF PINEDALE AND BULL LAKE GLACIATIONS
- ◆ GRAVELS AND ALLUVIUMS (PINEDALE AND BULL LAKE AGE)
- ◆ HERMOSA FORMATION
- ◆ INTRA-ASH FLOW ANDESITIC LAVAS
- ◆ LANDSLIDE DEPOSITS
- ◆ LARAMIDE INTRUSIVE ROCKS (AGE 40-72? M.Y.)
- ◆ LEADVILLE LIMESTONE, GILMAN SANDSTONE, DYER DOLOMITE AND PARTING FORMATION
- ◆ MANCOS SHALE
- ◆ MESAVERDE GROUP, UNDIVIDED
- ◆ MIDDLE TERTIARY INTRUSIVE ROCKS (AGE 20-40 M.Y.)
- ◆ MODERN ALLUVIUM
- ◆ MORRISON FORMATION
- ◆ MORRISON FORMATION, SUMMERVILLE FORMATION (SHALE AND SILTSTONE), AND ENTRADA SANDSTONE
- ◆ MORRISON, WANAKAH, AND ENTRADA FORMATIONS
- ◆ OLDER GLACIAL DRIFT (PRE-BULL LAKE AGE)
- ◆ OLDER GRAVELS AND ALLUVIUMS (PRE-BULL LAKE AGE)
- ◆ PRE-ASH-FLOW ANDESITIC LAVAS, BRECCIAS, TUFFS, AND CONGLOMERATES (GENERAL AGE 30-35 M.Y.)
- ◆ TELLURIDE CONGLOMERATE OF EOCENE PREVOLCANIC SEDIMENTARY ROCKS (Te) AND CIMARRON RIDGE FORMATION (UPPER CRETACEOUS, VOLCANIC BRECCIA AND CONGLOMERATE, AGE ABOUT 66 M.Y.)
- ◆ UNCOMPAHGRE FORMATION (OLDER THAN GRANITES OF 1,400-M. Y. AGE GROUP AND YOUNGER THAN GRANITES OF 1,700 M.Y. AGE GROUP)
- ◆ WATER

**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.

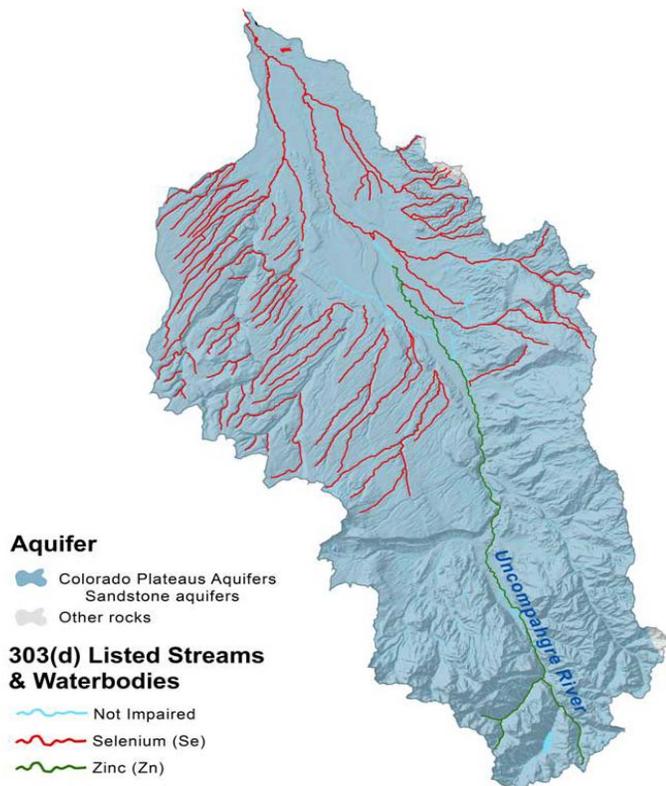
Soils with an erodibility index equal to or greater than 8 are considered highly erodible.

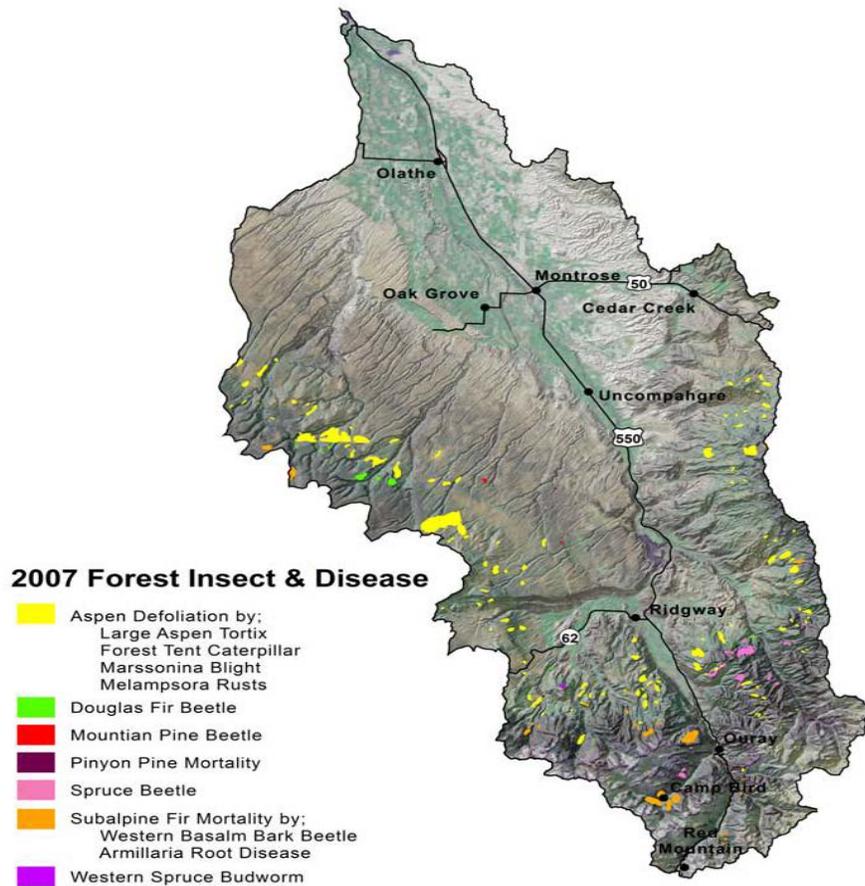
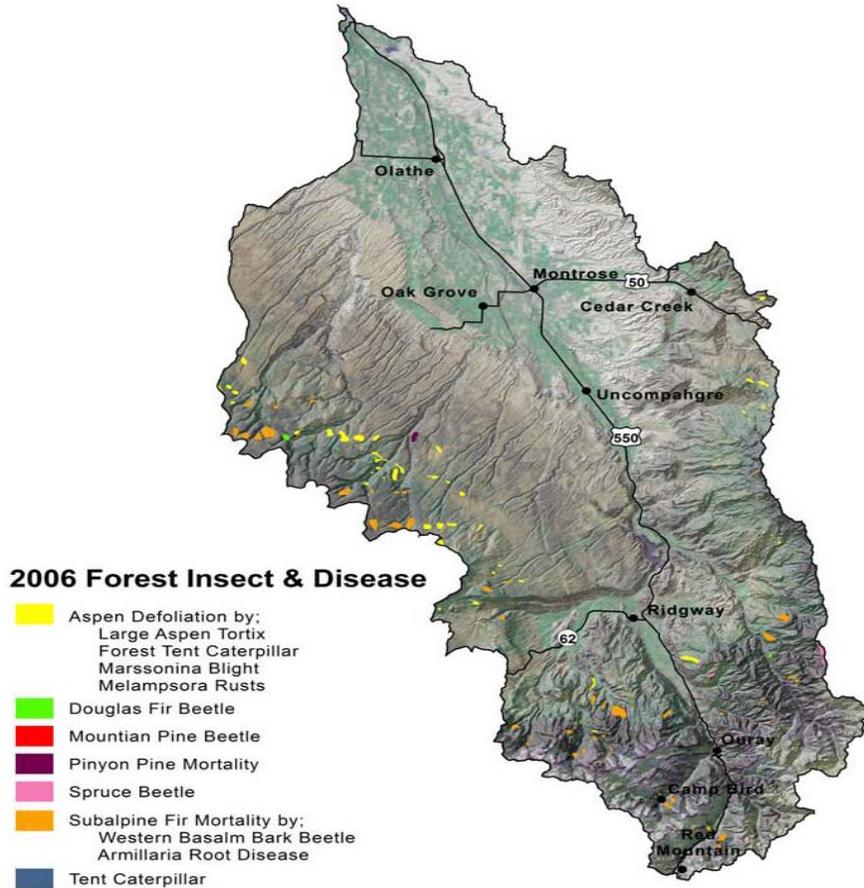
As shown on the Wind Erodibility Index map below, most cropland soils in the Uncompaghre Watershed are considered highly erodible.



**Stream Impairments**

Section 303(d) of the Clean Water Act requires states to identify and list all water bodies where state water quality standards are not being met. Thereafter, TMDLs compromising quantitative objectives and strategies have been or will be developed for these impaired waters within the watershed in order to achieve their water quality standards.



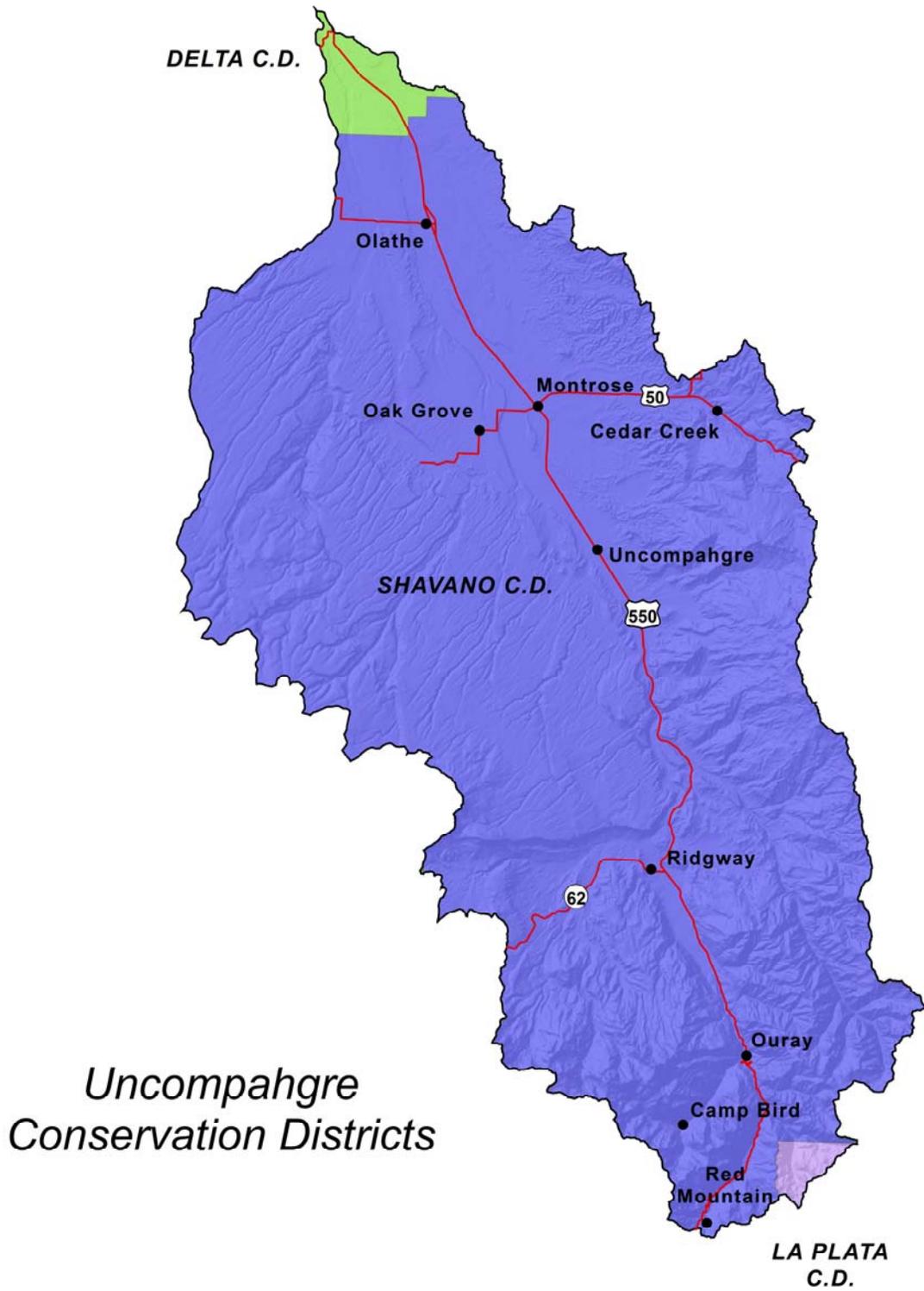


State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Uncompahgre Watershed				
Common Name	Scientific Name	Class	State Status/Federal Status	Comments
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Birds	Concern/None	Occurs in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Year round occurrence in the watershed
Black-footed Ferret	<i>Mustela nigripes</i>	Mammals	Endangered/Endangered	No current records of occurrence
Bonytail	<i>Gila elegans</i>	Fish	Endangered/Endangered	Water depletions in the watershed may affect downstream habitats/ fish
Burrowing Owl	<i>Athene cucularia</i>	Birds	Threatened/None	Occurs in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	May occur in the watershed
Clay-loving Wild Buckwheat	<i>Eriogonum pelinophilum</i>	Plants	None/Endangered	Occurs n the watershed
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Fish	Threatened/Endangered	Water depletions in the watershed may affect downstream habitats/fis
Colorado River Cutthroat Trout	<i>Oncorhynchus clarki pleuriticus</i>	Fish	Concern/None	Occurs in the watershed
Colorado Roundtail Chub	<i>Gila robusta</i>	Fish	Concern/None	Occurs in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern/None	May occur in the watershed
Greater Sandhill Crane	<i>Grus canadensis tabida</i>	Birds	Concern/None	May occur in the watershed
Gunnison Sage Grouse	<i>Centrocercus minimus</i>	Birds	Concern/None	Occur in the watershed
Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	Mammals	None/Concern	Occurs in the watershed
Humpback Chub	<i>Gila cypha</i>	Fish	Threatened/Endangered	Water depletions in the watershed may affect downstream habitats/ fish
Kit Fox	<i>Vulpes macrotis</i>	Mammals	Endangered/None	Occurs in the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	May occur in the watershed
Midget Faded Rattlesnake	<i>Crotalus viridis concolor</i>	Reptiles	Concern/None	May occur in the watershed
Mountain Sucker	<i>Catostomus playtrhynchus</i>	Fish	Concern/None	Occurs in the watershed
Northern leopard frog	<i>Rana pipiens</i>	Amphibians	Concern/None	Occurs in the watershed
Razorback Sucker	<i>Xyrauchen texanus</i>	Fish	Endangered/Endangered	Water depletions in the watershed may affect downstream habitats/fis
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/None	May occur in the watershed
Uinta Basin Hookless Cactus	<i>Sclerocactus glaucus</i>	Plants	None/Threatened	May occur in the watershed
Western Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Birds	Concern/Candidate	May occur in the watershed
Wolverine	<i>Gulo gulo</i>	Mammals	Endangered/None	May occur in the watershed

The terrestrial habitats in this watershed include irrigated cropland; desert shrub and grassland; foothills, montane, and sub-alpine shrub and forest including aspen and mixed conifer forest, and saltbush, big sagebrush, and pinyon-juniper shrublands. Significant aquatic habitats are found in the Uncompahgre River, and in other riparian and wetland areas in the watershed. These habitats provide food, cover, or water for many native species at some life stage.

Economically important species in the watershed include: black bear, elk, mule deer, mountain lion, wild turkey and sport fish throughout most of the watershed. Snow geese make use of the Uncompahgre River and associated riparian fields. White-tailed ptarmigan occur in the southern part of the watershed at high elevations. Trout occur at high elevations where water temperatures are cooler and warm-water fish at lower elevations. The watershed also supports a few populations of bighorn sheep.

Social Data	Delta	Montrose	Ouray
<b>Demographics (US Census, American Factfinder)</b>			
Total population	27,834	33,432	3,742
Male	13,972	16,458	1,890
Female	13,862	16,974	1,852
Median age (years)	42.3	38.8	43.4
White	25,688	30,074	3,605
Black or African American	146	102	3
American Indian and Alaska Native	211	340	35
Asian	89	140	13
Native Hawaiian and Other Pacific Islander	7	23	23
Some other race	1184	1920	20
Hispanic or Latino (of any race)	3171	4967	152
<b>Economic Characteristics (US Census, American Factfinder)</b>			
In labor force (population 16 years and over)	12,088	15,984	1,885
Median household income (dollars)	32,785	35,234	42,019
Median family income (dollars)	37,748	40,849	49,776
Per capita income (dollars)	17,152	17,158	24,335
Families below poverty level	679	824	68
Individuals below poverty level	3272	4160	269
X means that value is not applicale or not available			
<b>County Agricultural Characteristics (Colorado Agricultural Census, county data tables)</b>			
Farms (number)	1063	915	96
Land in farms/ranches (acres)	262,443	334,747	108,088
Average size farm/ranch (acres)	247	366	1,126
Median size farm (acres)	50	73	200
Average age of farmer or rancher	56.1	55.1	60.2
Net cash return from ag sales (\$1,000)	3,191	15,237	-94
Cattle and calves (number)	23,000	41,000	6,000



Selected Conservation Application Data		Uncompaghe 14020006			
	FY 2004	FY 2005	FY 2006	FY 2007	Total
Practices					
Prescribed Grazing	0	0	2,706	1,298	4,257
Irrigation Water Management	257	3,214	2,227	2,016	7,714

### Conservation Systems to Address Major Resource Concerns

Primary Resource Concern: Rangeland Health				
Conservation System Description:		Based on Conservation System Guide Code: <a href="#">CO 36.1-GR-01-R-Grazing</a>		
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost per Median Sized Ranch (\$)
Prescribed Grazing				
Fence (382)	Ft.	5,120	0.6	3,072
Pest Management (595)	Ac.	300	4,500	4,500
Pipeline (516)	Ft.	5,000	2.40	12,000
Upland Wildlife Habitat Management (645)	Ac.	300	na	0
Watering Facility (614)	No.	2	410	820
Costs to apply prescribed grazing per median sized ranch of 5,000 acres	No.	63	20,392	1,284,696
Subtotal Rangeland costs:				\$1,284,696

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

Primary Resource Concern: Inefficient water use on irrigated land				
Conservation System Description:	Earthen ditch irrigation system converted to Sideroll Sprinkler System with Structure for Water Control, Underground Pipeline, IWM,			Reference Conservation System Guide Code: <a href="#">CO 34A.1-CR-Gravity-R-2</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation Water Management (449) includes:	Ac	22,000	3,992	87,824,000
Conservation Crop Rotation (328)	Ac			
Irrigation System, Sprinkler (442)	Ac			
Nutrient Management (590)	Ac			
Pest Management (595)	Ac			
Residue Mgmt, Mulch Till (345)	Ac			
Subtotal Costs Irrigated Crops \$87,824,000				

### 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.	1,284,696
Irrigated Crops	Water	Improved water use	Cropland sustainability	87,824,000
Estimated Total Costs to Address Major Resource Concerns:				\$89,108,696

## References Not Cited in Document

**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>. 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:

Animas-Dolores Area (672) Published 01/08/2007	San Miguel Area (CO675) Published 01/10/2007
Uncompahgre Area (CO676) Published 01/10/2007	Ridgeway Area (CO677) Published 07/10/2006
Paonia Area (CO679) Published 01/10/2007	

**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](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>.