



United States Department  
of Agriculture

# Upper Gunnison Watershed



Hydrologic Unit Code 14020002

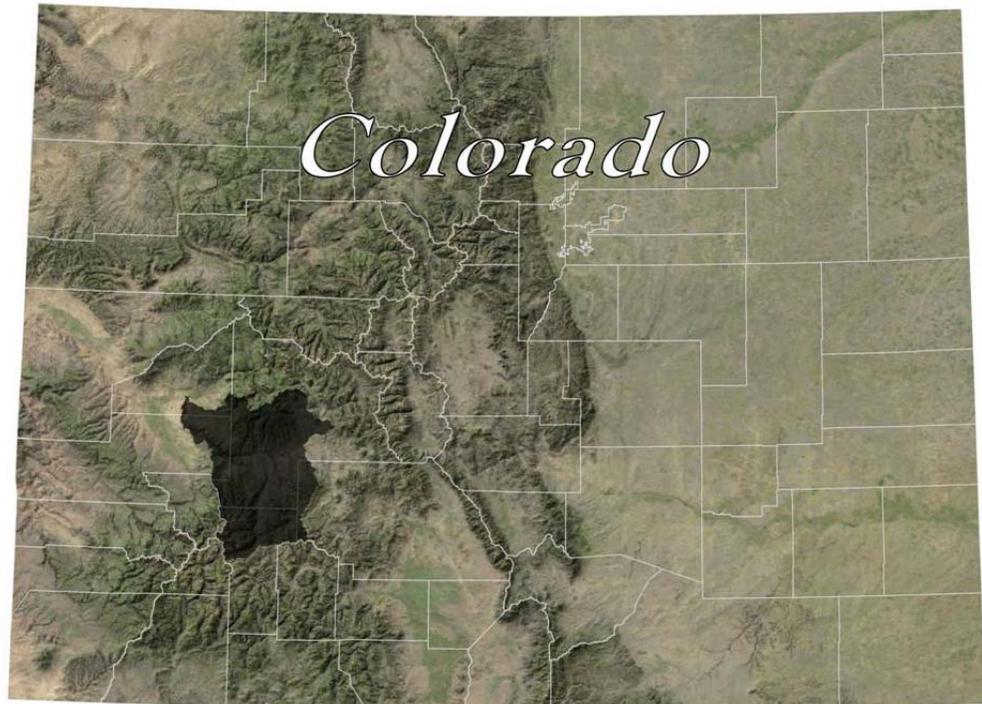
Natural Resources  
Conservation Service

Lakewood, Colorado

## Rapid Assessment

RWA 14020002

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 land-owners 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)

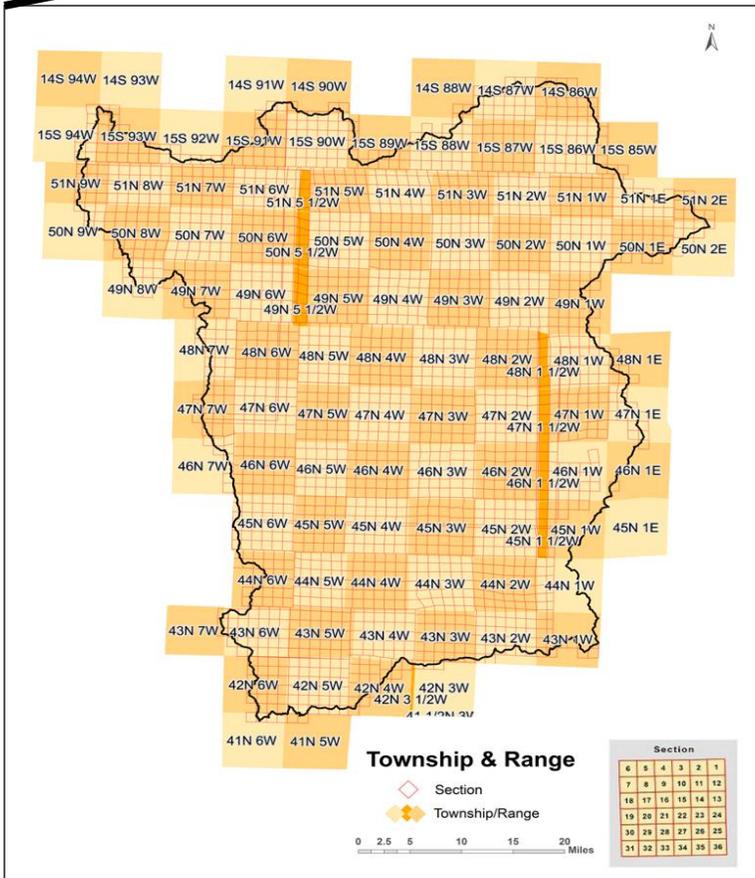
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Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

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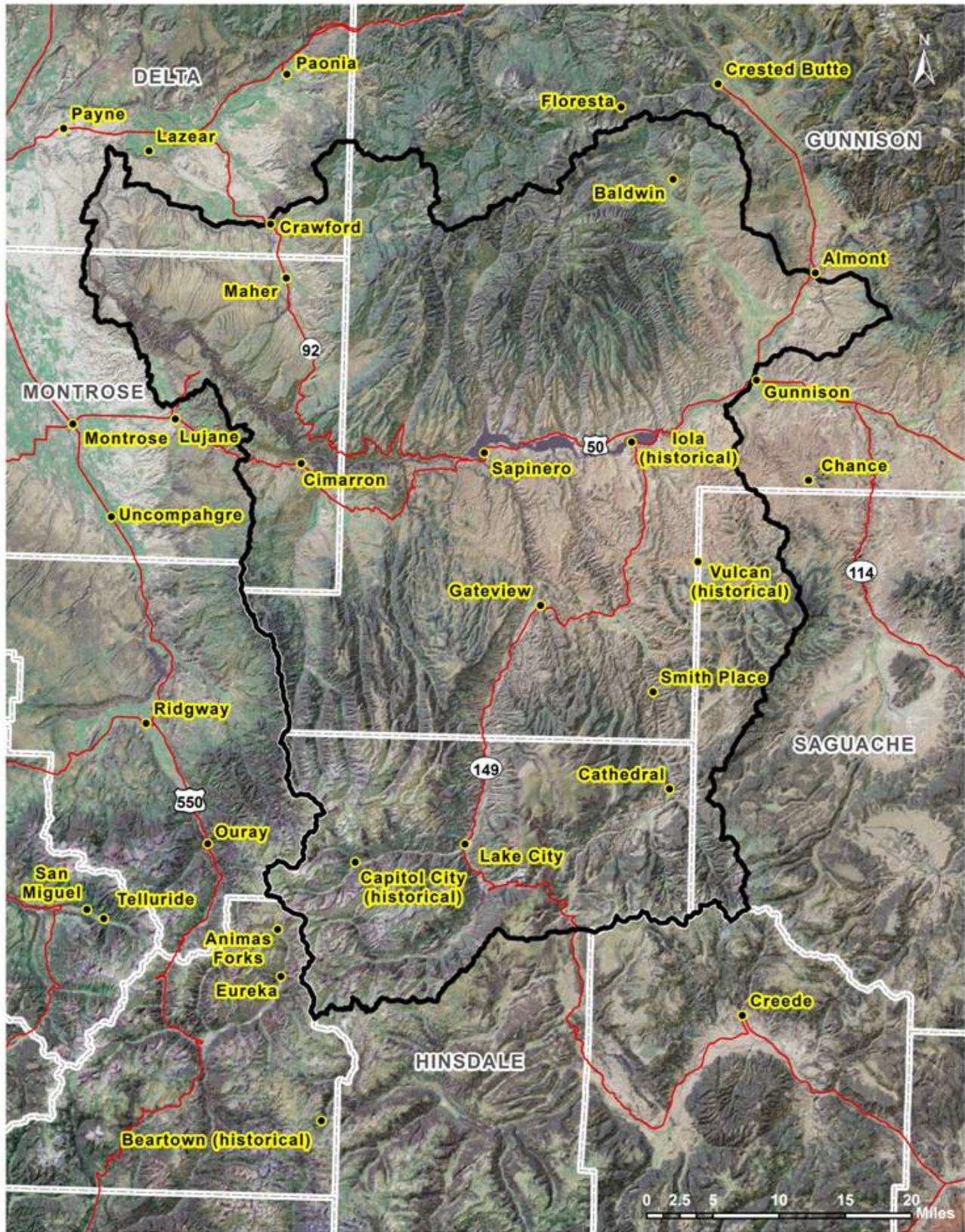


Satellite Imagery: ArcGIS Server - Geographic Network Services hosted by ESRI

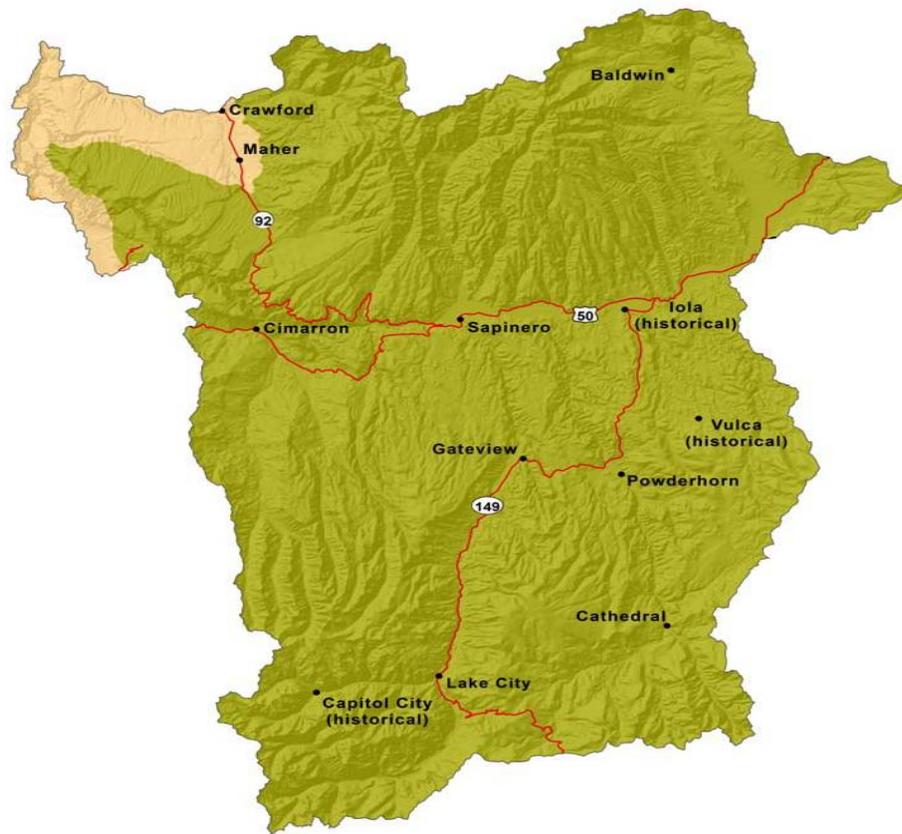


County	County Acres	County Acres in UPPER GUNNISON Watershed	% of County in the Watershed	% of Watershed in the County
Delta	735,674	56,141	7.6%	3.6%
Gunison	2,085,945	880,653	42.2%	57.1%
Hinsdale	719,387	321,324	44.7%	20.8%
Montrose	1,437,265	187,699	13.1%	12.2%
Saguache	2,027,649	97,532	4.8%	6.3%
		1,543,471		

# Upper Gunnison Watershed - 14020002



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



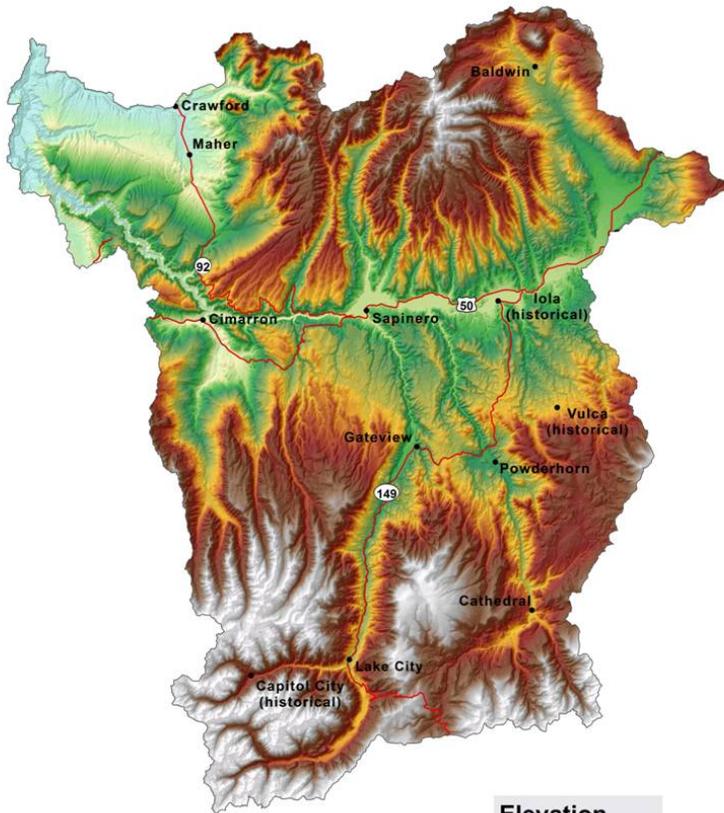
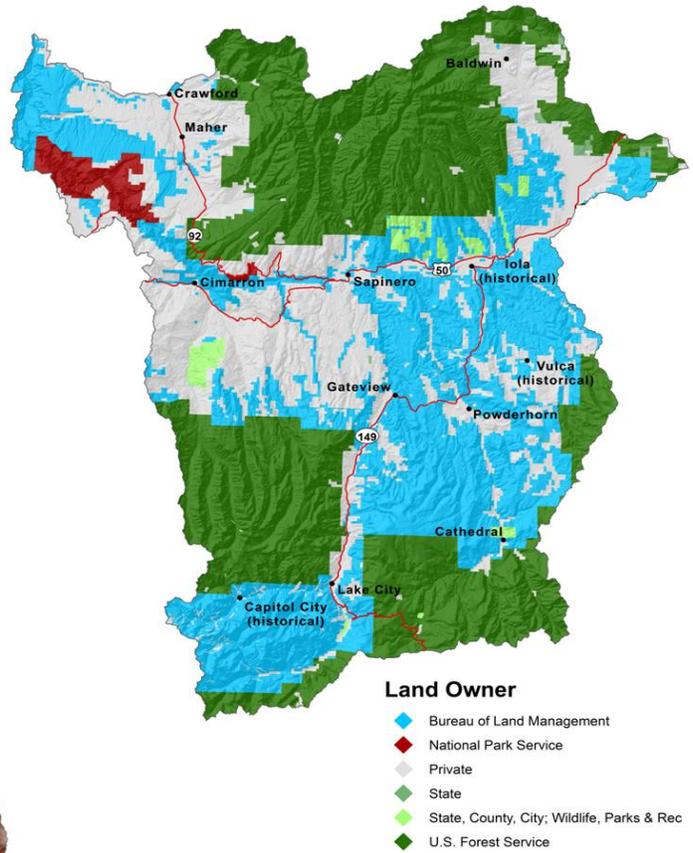
### Common Resource Area (CRA)

◆ 34B.1  
 ◆ 34B.2  
 ◆ 48A.1

**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
34B	34B.1	Warm Central Deserctic 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 Deserctic 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.
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.

Upper Gunnison Watershed Land Ownership	
Bureau of Land Management	
National Park Service	
Private	
State	
State, County, City; Wildlife, Parks & Rec	
U.S. Forest Service	





## Vegetation

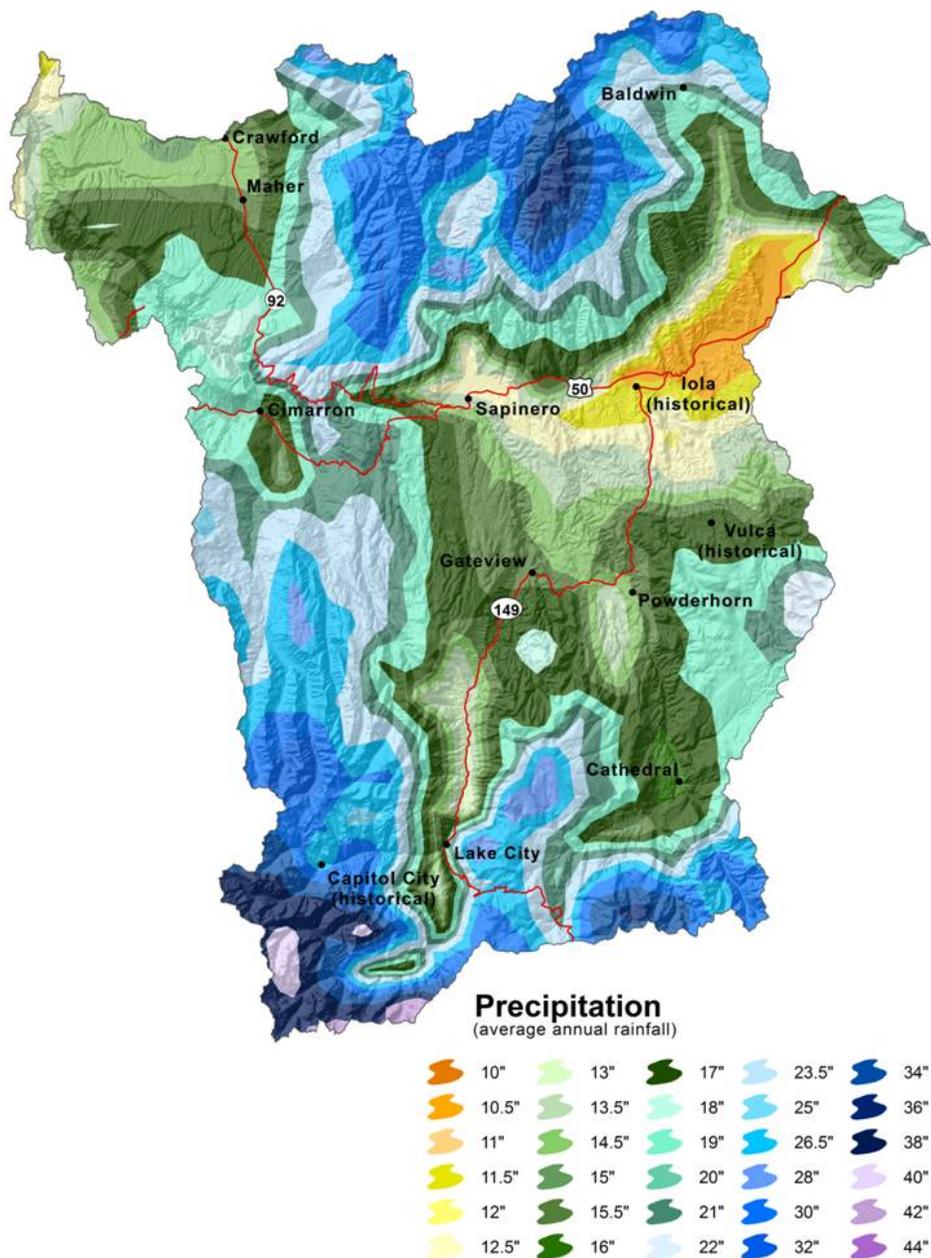
- |                           |                         |                                  |
|---------------------------|-------------------------|----------------------------------|
| ◇ Alpine/Subalpine/Tundra | ◇ Irrigated Ag          | ◇ Shrub/Grass/Forb Mix Rangeland |
| ◆ Coniferous Forest       | ◇ Other                 | ◆ Urban/Built Up                 |
| ◆ Mixed Forest            | ◇ Rangeland             | ◆ Water                          |
| ◇ Dryland Ag              | ◇ Riparian              | ◆ Woodland                       |
| ◆ Grass Dominated         | ◆ Shrub/Brush Rangeland |                                  |

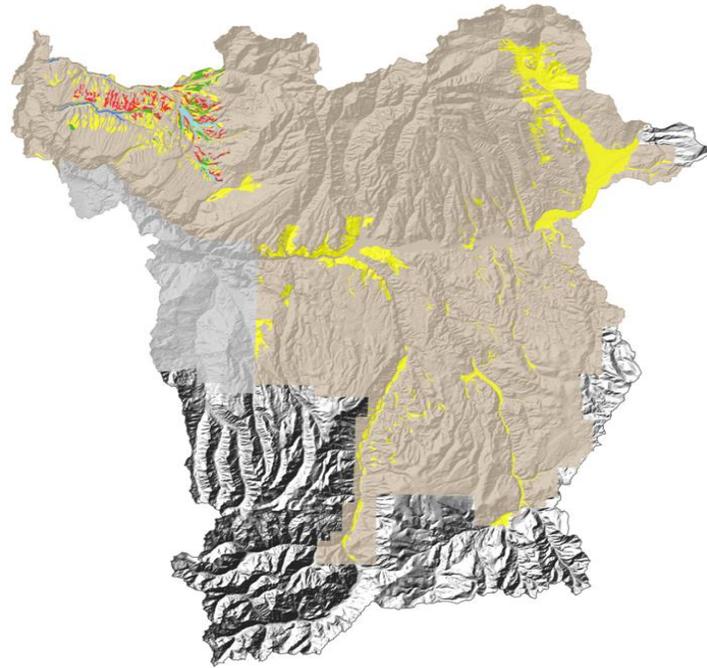
UPPER GUNNISON Land Use	Total Acreage	Vegetation	Acreage
Cropland	59,374	Dryland Ag	4,771
		Irrigated Ag*	54,603
Rangeland/Grassland	706,093	Alpine Forb Dominated	94
		Alpine Grass Dominated	633
		Alpine Grass/Forb Mix	365
		Alpine Meadow	111,341
		Gambel Oak	58,106
		Grass Dominated	398
		Grass/Forb Mix	166
		Grass/Forb Rangeland	74,896
		Greasewood	5
		Mesic Mountain Shrub Mix	11,220
		PJ-Mtn Shrub Mix	6,659
		PJ-Oak Mix	187
		PJ-Sagebrush Mix	11,089
		Pinon-Juniper	9,162
		Rangeland	8
		Sagebrush Community	143,361
		Sagebrush/Gambel Oak Mix	22,044
		Sagebrush/Grass Mix	242,585
		Sagebrush/Mesic Mtn Shrub Mix	150
		Saltbush Community	5,511
Sedge	14		
Serviceberry/Shrub Mix	26		
Sparse PJ/Shrub/Rock Mix	7,162		
SubAlpine Shrub Community	109		
Subalpine Grass/Forb Mix	798		
Xeric Mountain Shrub Mix	4		
Forest	587,187	Other Forest	105,536
		Aspen/Mesic Mountain Shrub Mix	19
		Douglas Fir	58,641
		Douglas Fir/Aspen Mix	38,822
		Englemann Spruce/Fir Mix	236,217
		Lodgepole Pine	1,095
		Lodgepole Pine/Aspen Mix	236
		Lodgepole/Spruce/Fir Mix	376
		P. Pine/Gambel Oak Mix	40
		Ponderosa Pine	27,560
		Ponderosa Pine/Aspen Mix	32
		Spruce/Fir Regeneration	187
		Spruce/Fir/Aspen Mix	117,638
		Spruce/Fir/Lodgepole/Aspen Mix	481
Spruce/Lodgepole Pine Mix	307		
Riparian	68,360	Cottonwood	4
		Herbaceous Riparian	94
		Riparian	14,498
		Shrub Riparian	13
		Willow	454
		Upland Willow/Shrub Mix	53,297
Water	12,607	Water	12,607
Other	110,025		
<b>-Total Watershed Acres</b>			<b>1,543,646</b>

\*Colorado Decision Support Systems Data

## Precipitation

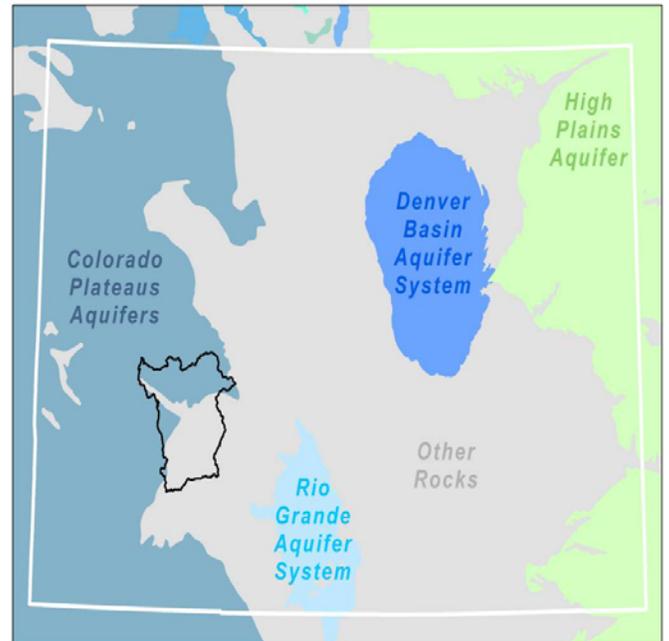
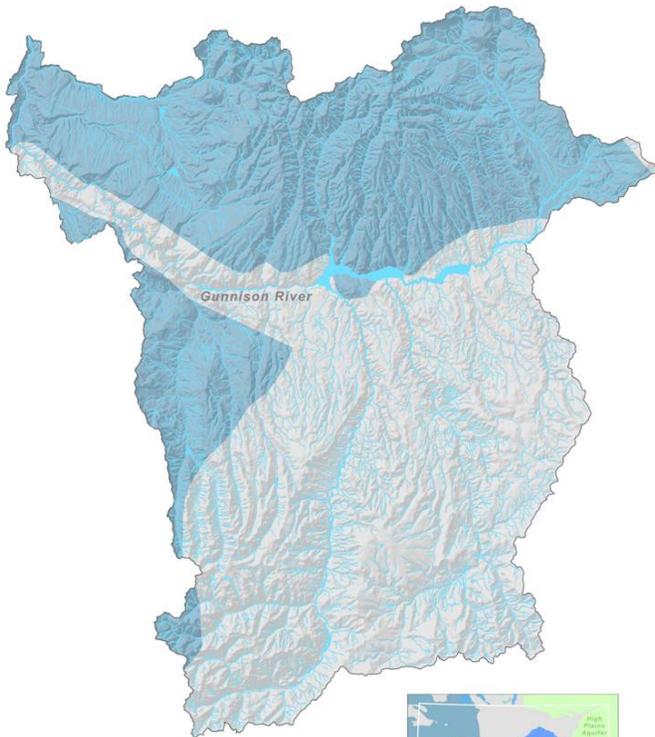
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series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





**Farmland Classification**

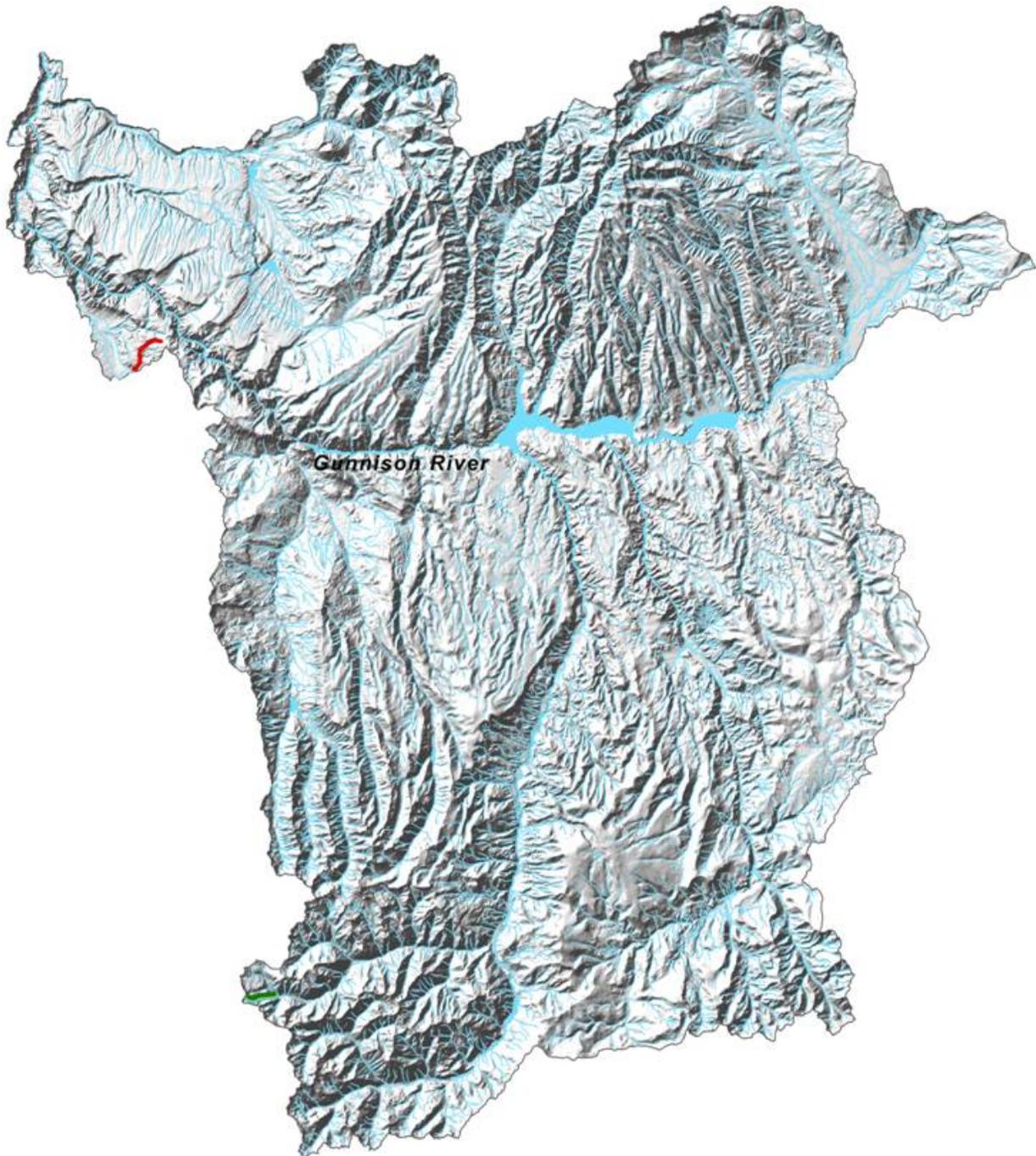
- ◆ Farmland of statewide importance
- ◆ Farmland of unique importance
- ◆ Not prime farmland
- ◆ Prime farmland if irrigated
- ◆ Prime farmland if irrigated and drained
- ◆ Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- ◆ No Data



**Aquifer**

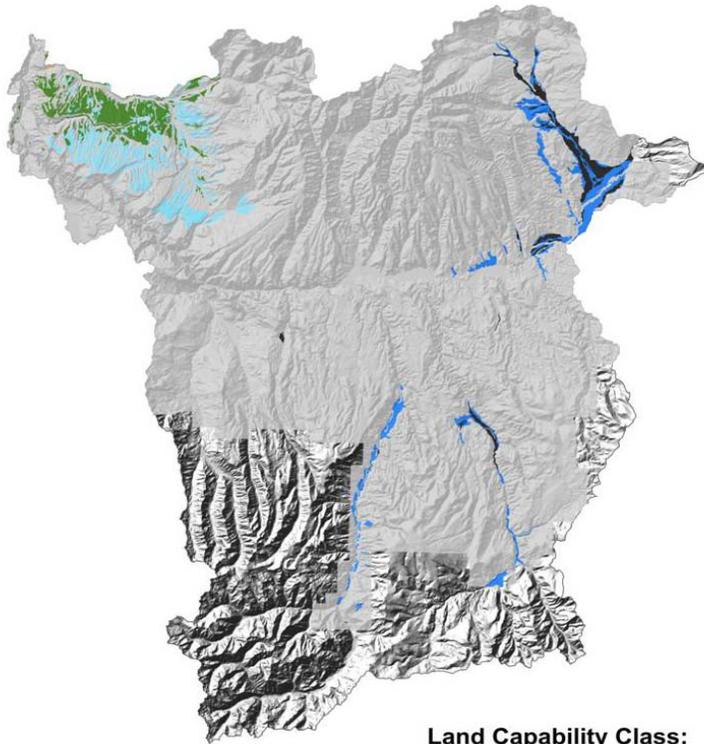
- Colorado Plateaus aquifers
- Rocks that are generally poorly permeable, but locally may contain productive aquifers



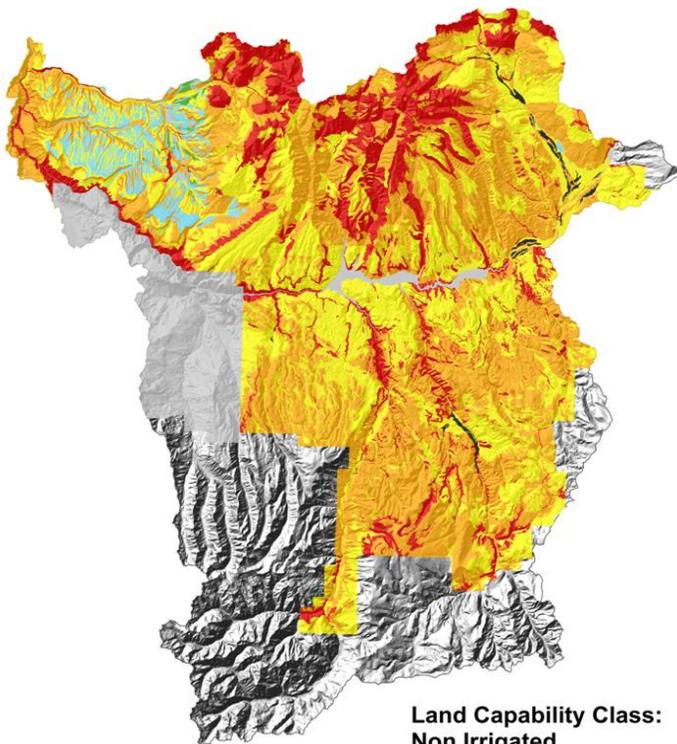


### 303(d) Listed Streams & Waterbodies





**Land Capability Class:  
Irrigated**



**Land Capability Class:  
Non Irrigated**



### Land Capability Classification

**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.

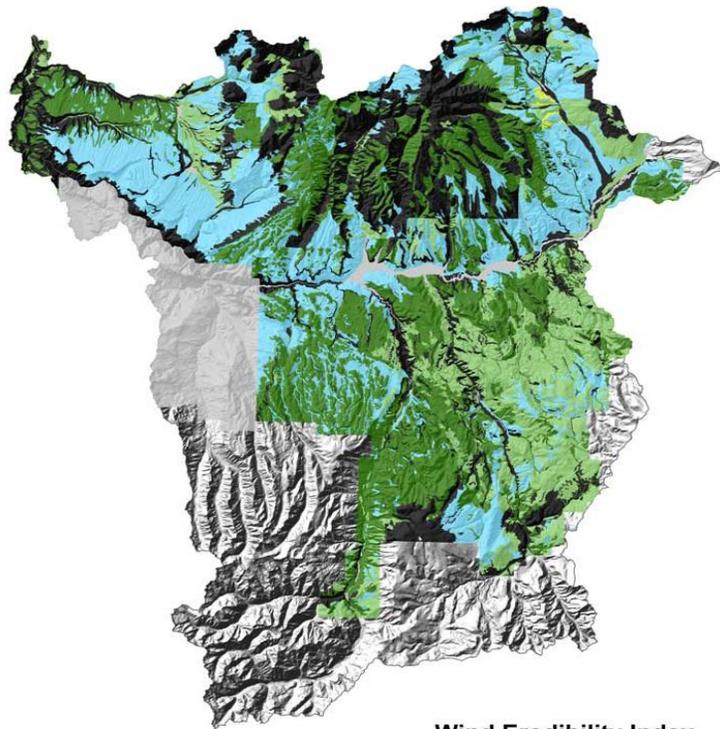
**Class 7** - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

**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.

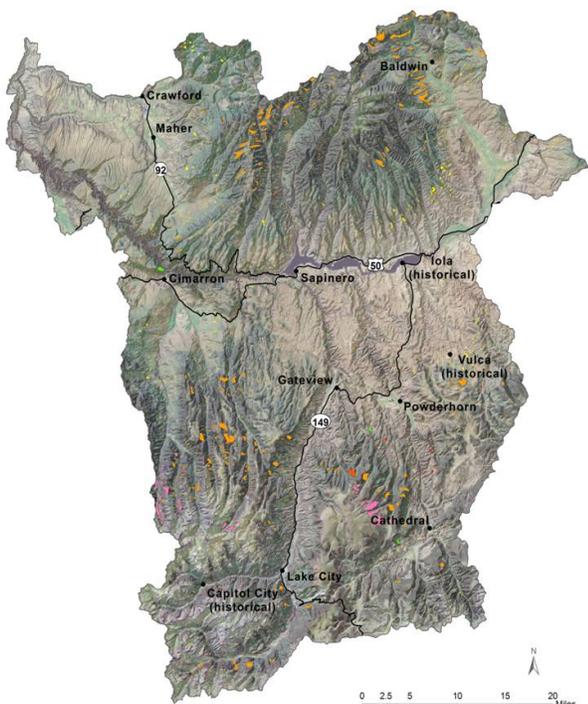
The Wind Erodibility Index (WEI), is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion if it is assumed there is no vegetative cover or management.

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

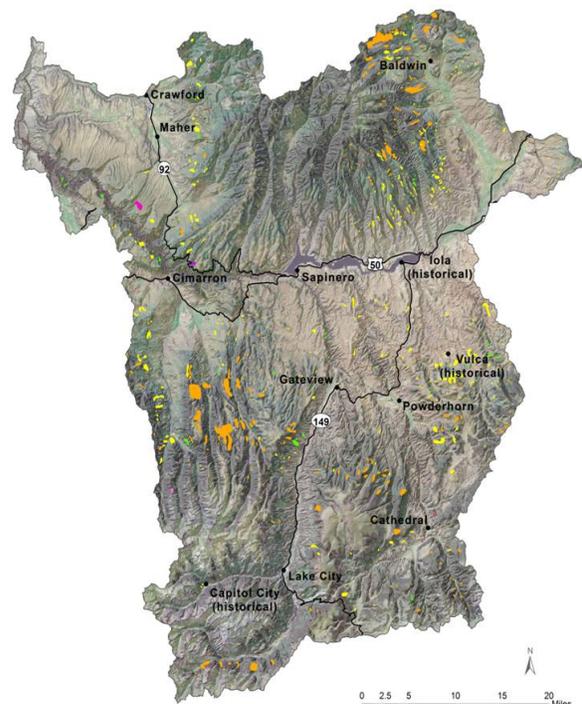
As shown on the Wind Erodibility Index map, most soils in the Upper Gunnison Watershed are highly erodible.



**Wind Erodibility Index**  
(Tons/Acre/Year)



**2006 Forest Insect & Disease**

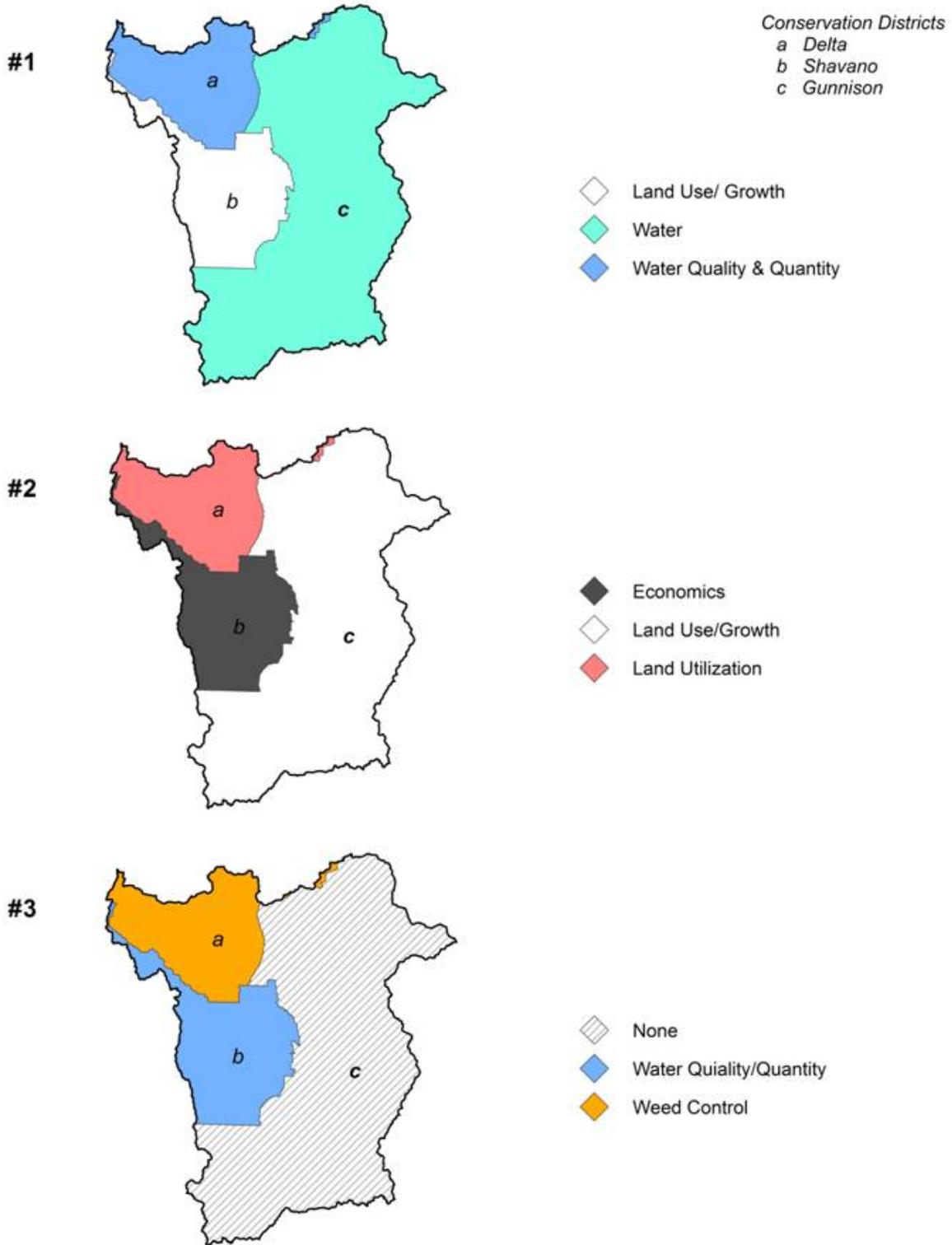


**2007 Forest Insect & Disease**



# Identified Long Range Resource Concerns

## Top Three Concerns within Conservation Districts



## Threatened & Endangered Species State & Federally Threatened, Endangered & Candidate Species as well as Species of Special Concern

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
Burrowing Owl	<i>Athene cunicularia</i>	Birds	Threatened		None	Occurs in the watershed
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
Gunnison Sage Grouse	<i>Centrocercus minimus</i>	Birds	Concern		None	Occurs 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
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
River Otter	<i>Lontra Canadensis</i>	Mammals	Threatened		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 a small amount of irrigated cropland; desert shrub and grassland; foothills, montane, and sub-alpine shrub and forest including aspen and mixed conifer forest, big sagebrush, and pinyon-juniper shrublands, and tundra at the highest elevations. Significant aquatic habitats are found in the Gunnison 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, moose, mountain lion, and trout throughout most of the watershed. Pronghorn and wild turkey have limited habitat in the watershed. Snow geese make use of the Gunnison River and major tributaries. White-tailed ptarmigan occur in the southern part of the watershed at high elevations. The watershed also supports bighorn sheep.

Social Data					
Demographics (US Census, American Factfinder)	Delta	Gunnison	Hinsdale	Montrose	Saguache
Total population	27,834	13,956	790	33,432	5,917
Male	13,972	7,563	406	16,458	2,984
Female	13,862	6,393	384	16,974	2,933
Median age (years)	42.3	30.4	43.9	38.8	36.9
White	25,688	13,269	769	30,074	4,218
Black or African American	146	68	0	102	7
American Indian and Alaska Native	211	98	12	340	122
Asian	89	75	2	140	27
Native Hawaiian and Other Pacific Islander	7	5	0	23	0
Some other race	1184	201	3	1920	1361
Hispanic or Latino (of any race)	3171	700	12	4967	2678
Economic Characteristics (US Census, American Factfinder)					
In labor force (population 16 years and over)	12,088	8,635	459	15,984	2,666
Median household income (dollars)	32,785	36,916	37,279	35,234	25,495
Median family income (dollars)	37,748	51,950	42,159	40,849	29,405
Per capita income (dollars)	17,152	21,407	22,360	17,158	13,121
Families below poverty level	679	182	11	824	291
Individuals below poverty level	3272	1949	57	4160	1325
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)					
Farms (number)	1063	186	19	915	252
Land in farms/ranches (acres)	262,443	165,488	8,681	334,747	477,003
Average size farm/ranch (acres)	247	890	457	366	1,893
Median size farm (acres)	50	320	281	73	640
Average age of farmer or rancher	56.1	53.1	54.4	55.1	54.1
Net cash return from ag sales (\$1,000)	3,191	1,669	-333	15,237	24,040
Cattle and calves (number)	23,000	19,000	1,000	41,000	20,000

Selected Conservation Application Data				Upper Gunnison Watershed – 14020002			
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	6,451	25,350	NA	15,799	18,792	16,476	82,868
Total Conservation Systems Applied (Acres)	5,231	26,687	NA	13,622	9,353	16,103	70,996
<b>Practices Applied</b>							
Prescribed Grazing	9,718	25,242	12,571	3,719	5,165	4,410	60,825
Upland Wildlife Habitat Management	742	14,687	3,507	179	80	1,443	20,638
Irrigation Water Management	1,509	3,726	334	1,472	475	1,012	8,528

### 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 82,000 acres need to be treated on median sized ranches of 750 acres.			Based on Conservation System Guide Code: <a href="#">CO 48A-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.	1	410	410
Costs to apply prescribed grazing per median sized ranch of 5,000 acres	No.	109	19,982	2,178,038
<b>Subtotal Rangeland costs:</b>				<b>\$2,178,038</b>

<b>Conservation System Description:</b>		Surface irrigation on hayland converted to more efficient systems with IWM, Nutrient and Pest Mgt.		<b>Reference Conservation System Guide Code:</b> CO 48A-CR-R-2
<b>Practices</b>	<b>Unit</b>	<b>Quantity</b>	<b>Cost/Unit (\$)</b>	<b>Estimated Cost (\$)</b>
Irrigation Water Management (449)	Ac	14,000	1200	16,800,000
Nutrient Management (590)	Ac	24,000	5	120,000
Pest Management (595)	Ac	14,000	15	210,000
<b>Subtotal Irrigated Crops:</b>				<b>\$17,130,000</b>

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

Landuse	Resource	Measurable Effects	Non-measurable Effects	Cost (\$)
Rangeland	Plants		Improved plant condition, productivity, health and vigor. Grazing animals have adequate feed, forage, and shelter.	2,178,038
Irrigated Hayland	Water		Efficient Water Use; Cropland sustainability	17,130,000
<b>Total Costs</b>				<b>\$19,308,038</b>

## 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/100293wqlimitedsegtmls.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>. These concerns were compared with resource needs information gathered from each FO in 2007.

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

Grand Mesa-West Elk Area (CO660) Published 09/28/2007

Gunnison Area (CO662) Published 01/04/2007

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>.

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. 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). 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/>