



United States Department
of Agriculture

Saguache Watershed



Hydrologic Unit Code 13010004

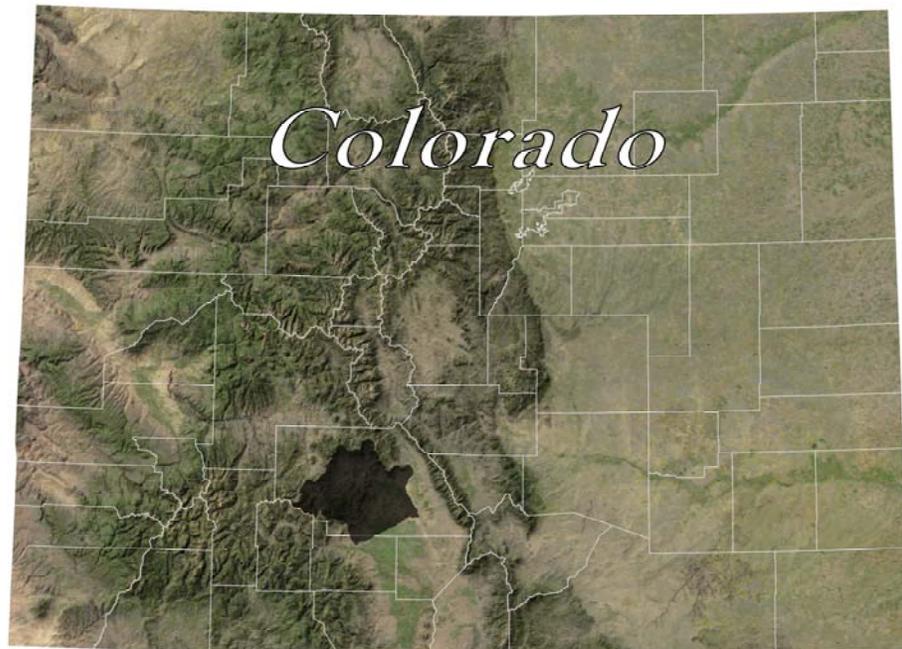
Natural Resources
Conservation Service

Rapid Assessment

Lakewood, Colorado

RWA 13010004

May 2007



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.

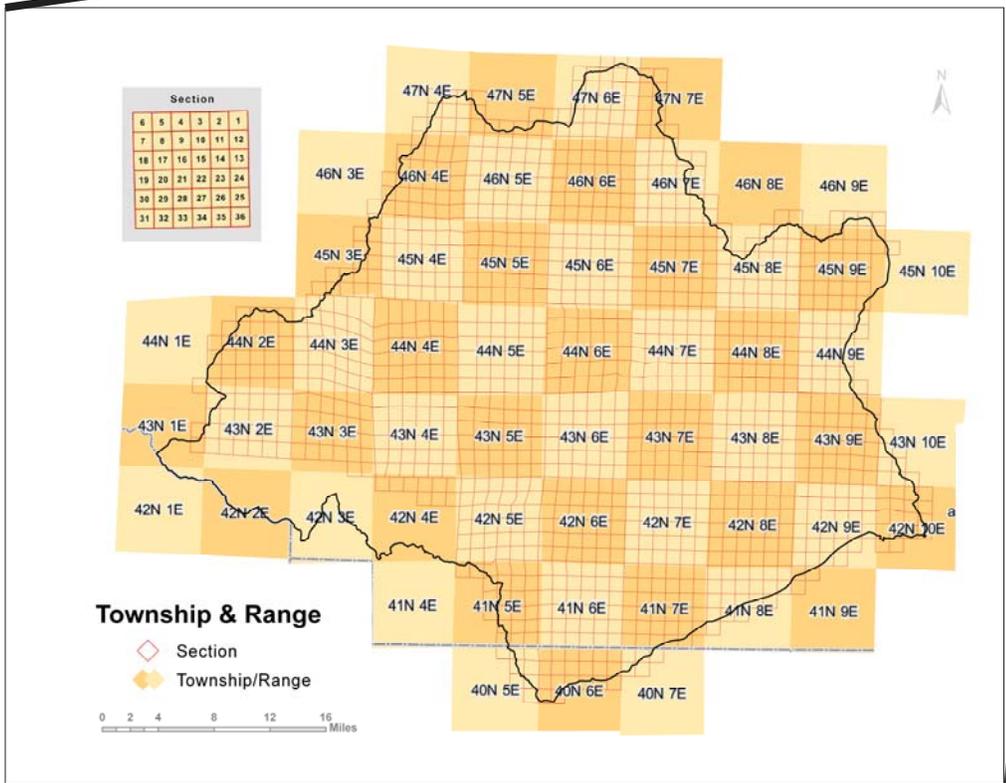
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best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

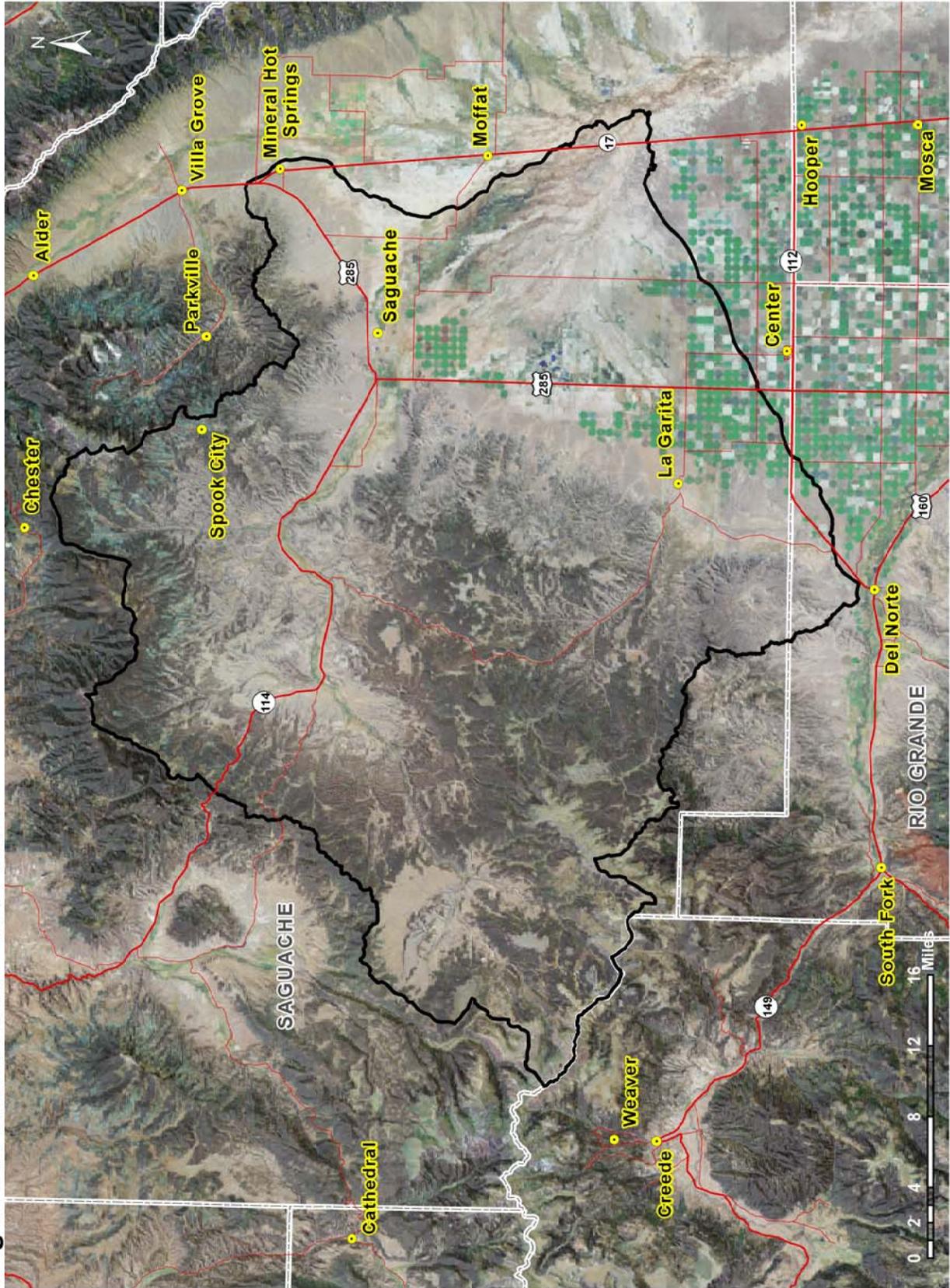
- Quick and inexpensive tools for setting priorities and taking action
- Providing a level of detail that is sufficient for identifying actions that can be taken with no further watershed-level studies or analyses
- Actions to be taken may require further Federal or State permits or ESA or NEPA analysis 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)

Rapid Watershed Assessments provide information that helps landowners and local leaders set conservation priorities.

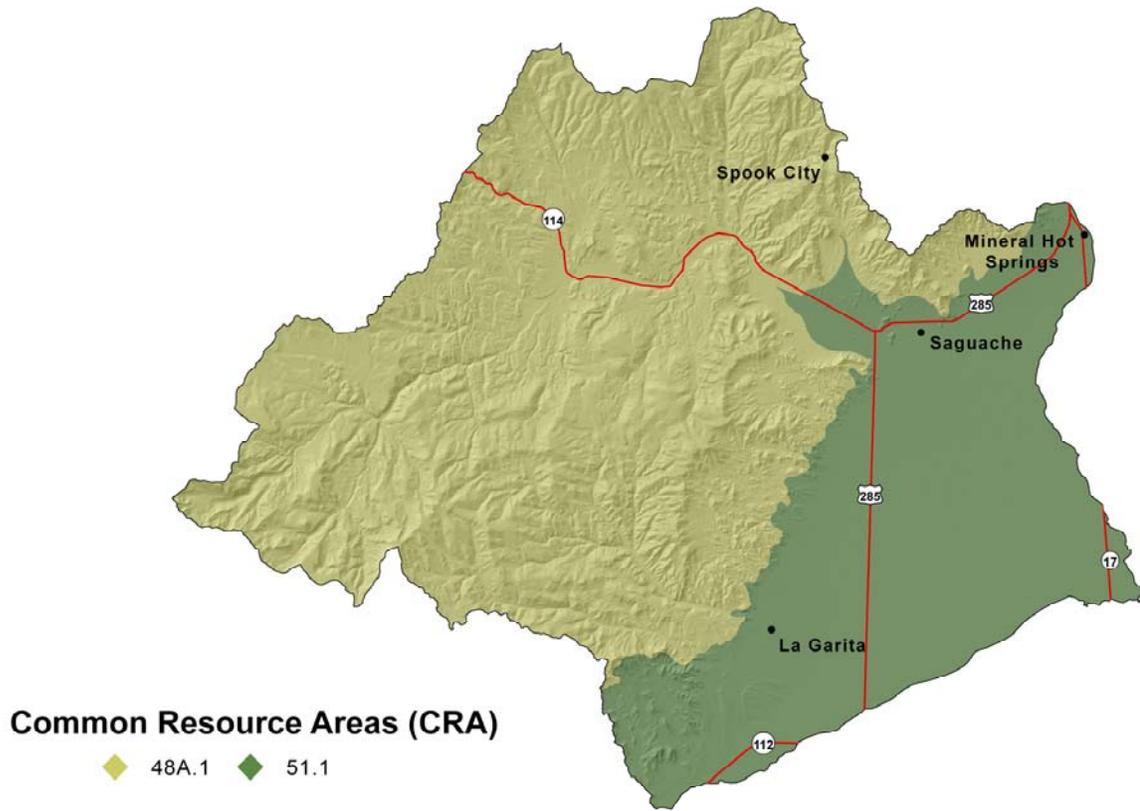


County	County Acres	County Acres in SAGUACHE Watershed	% of County in the Watershed	% of Watershed in the County
Rio Grande	584,463	14,494	2.5%	1.7%
Saguache	2,027,649	844,443	41.6%	98.3%
Total Watershed Acres		858,974		

Saguache Watershed - 13010004



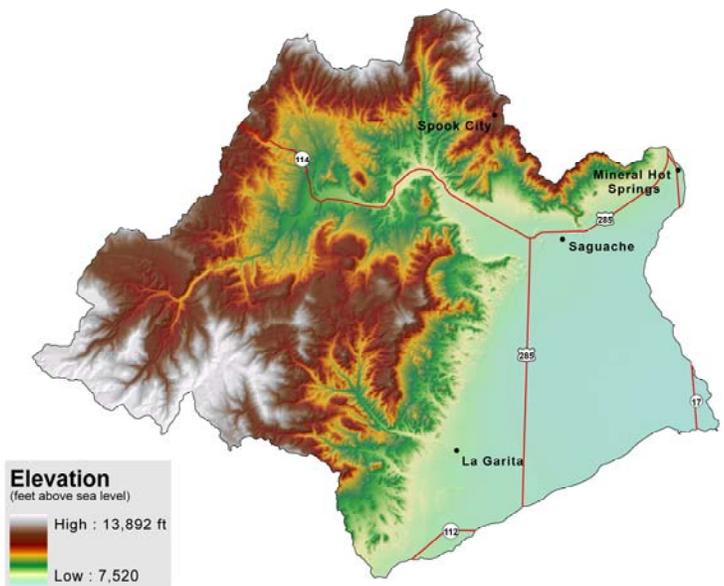
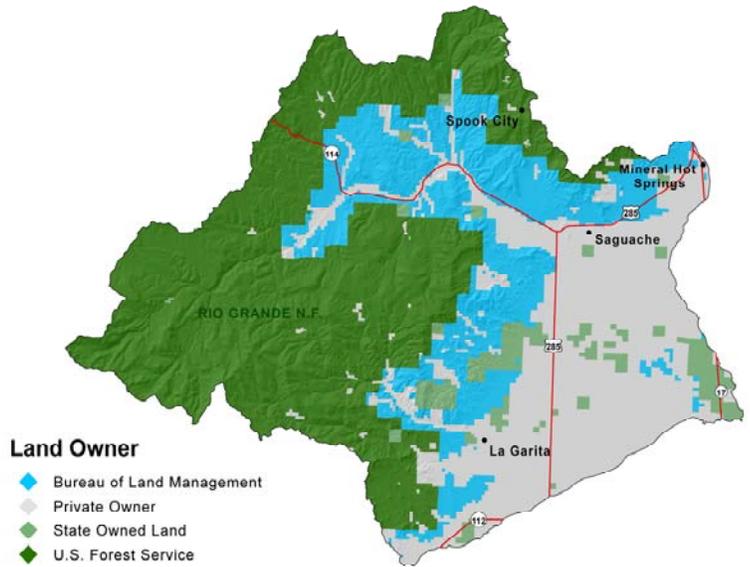
Satellite Imagery: Arc IMS Server - Geographic Network hosted by ESRI

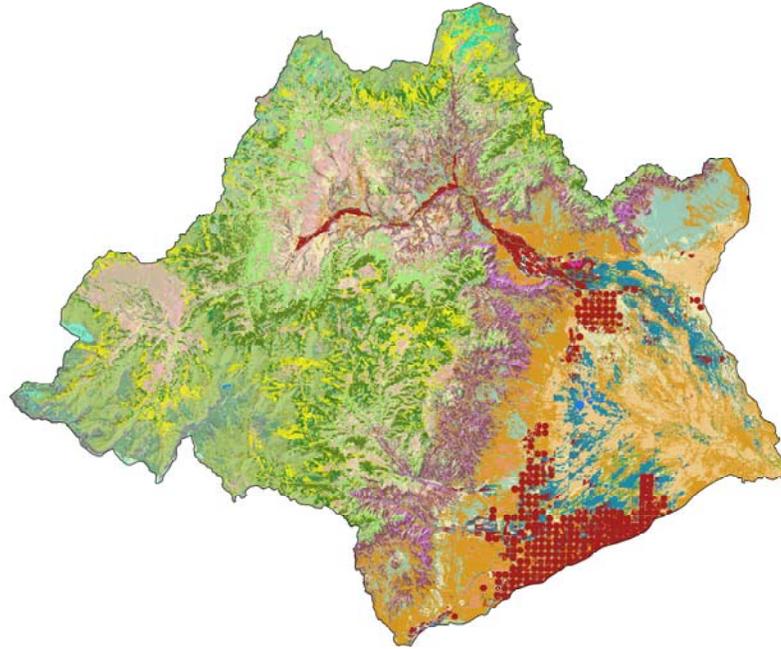


Common Resource Areas (CRA): Geographical areas where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

<u>MLRA</u>	<u>CRA</u>	<u>CRA NAME</u>	<u>DESCRIPTION</u>
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
51	51.1	High Intermountain Valleys	This is an area of low relief composed of valley fill sediments from the surrounding mountains. The temperature regime is mainly frigid but includes mesic in the southern part. The moisture regime is aridic. Characteristic native vegetation is greasewood, fourwing saltbush, and alkali sacaton.

Saguache Watershed Land Ownership	
Bureau of Land Management	172,217
Private	241,374
State	38,136
State, County, City; Wildlife, Parks & Rec	2,237
U.S. Forest Service	405,010

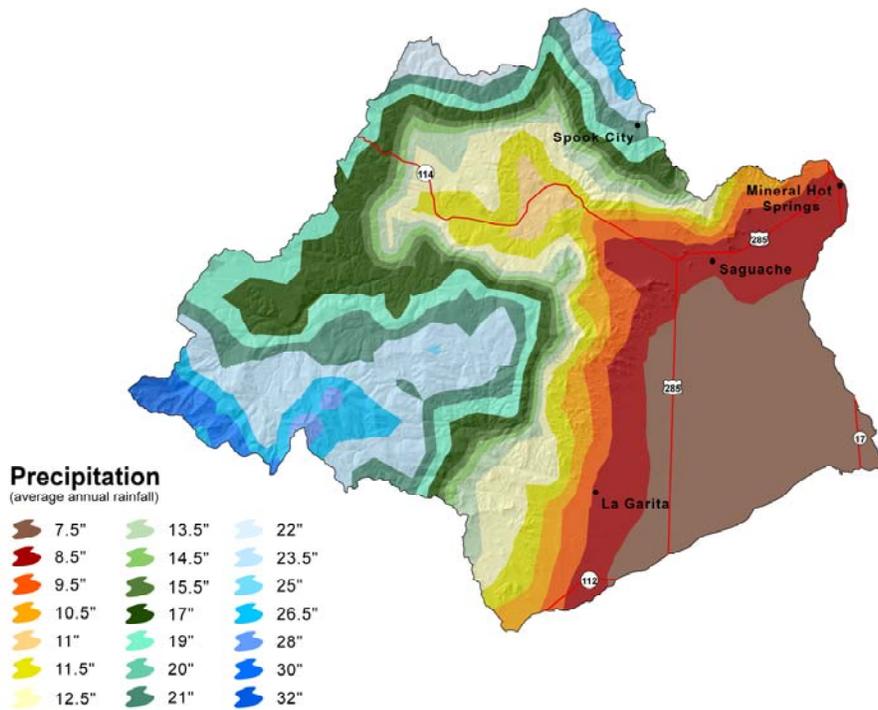




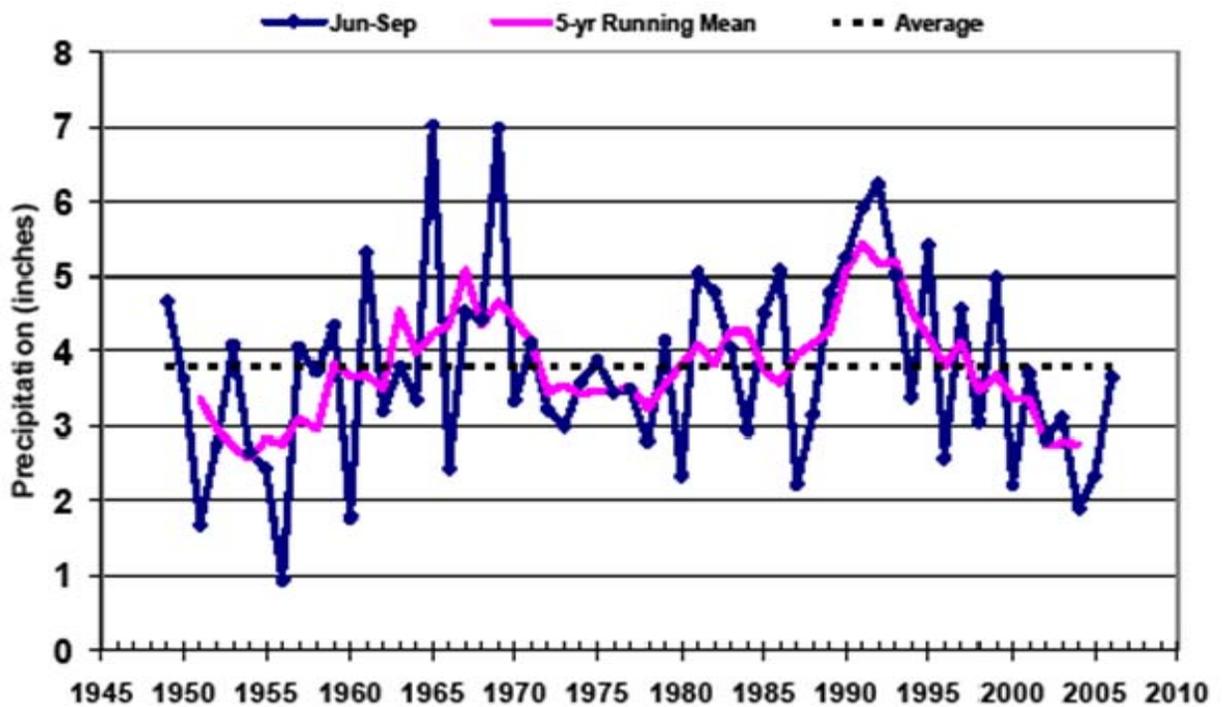
Vegetation

- | | |
|------------------------------------|----------------------------------|
| ◆ No Data | ◆ Rabbitbrush/Grass Mix |
| ◆ Alpine Grass Dominated | ◆ Residential |
| ◆ Alpine Grass/Forb Mix | ◆ Rock |
| ◆ Aspen | ◆ Sagebrush/Gambel Oak Mix |
| ◆ Bristlecone Pine | ◆ Sagebrush/Grass Mix |
| ◆ Commercial | ◆ Sagebrush/Mesic Mtn Shrub Mix |
| ◆ Cottonwood | ◆ Sand Dune Complex |
| ◆ Douglas Fir | ◆ Sedge |
| ◆ Douglas Fir/Aspen Mix | ◆ Shrub Riparian |
| ◆ Douglas Fir/Englemann Spruce Mix | ◆ Shrub/Grass/Forb Mix |
| ◆ Englemann Spruce/Fir Mix | ◇ Snow |
| ◆ Grass Dominated | ◆ Soil |
| ◆ Grass/Forb Mix | ◆ Sparse Grass (Blowouts) |
| ◆ Greasewood | ◆ Sparse PJ/Shrub/Rock Mix |
| ◆ Herbaceous Riparian | ◆ Spruce/Fir/Aspen Mix |
| ◆ Irrigated Ag | ◆ Spruce/Fir/Lodgepole/Aspen Mix |
| ◆ Limber Pine | ◆ Spruce/Lodgepole Pine Mix |
| ◆ Lodgepole Pine | ◆ SubAlpine Shrub Community |
| ◆ Lodgepole Pine/Aspen Mix | ◆ Subalpine Grass/Forb Mix |
| ◆ Lodgepole/Spruce/Fir Mix | ◆ Talus Slopes & Rock Outcrops |
| ◆ PJ-Mtn Shrub Mix | ◆ Upland Willow/Shrub Mix |
| ◆ PJ-Sagebrush Mix | ◆ Water |
| ◆ Pinon-Juniper | ◆ Willow |
| ◆ Ponderosa Pine | ◆ Winterfat/Grass Mix |
| ◆ Ponderosa Pine/Douglas Fir Mix | ◆ Xeric Mountain Shrub Mix |

Land Use	Total Acreage	Vegetation	Acreage
Cropland	45,483	Irrigated Ag	45,483
Rangeland/Grassland	448,257	Alpine Grass Dominated	3,279
		Alpine Grass/Forb Mix	13,061
		Grass Dominated	47,310
		Grass/Forb Mix	50,738
		Greasewood	57,557
		PJ-Mtn Shrub Mix	3
		PJ-Sagebrush Mix	5
		Pinon-Juniper	12,907
		Rabbitbrush/Grass Mix	108,634
		Sagebrush/Gambel Oak Mix	6
		Sagebrush/Grass Mix	2
		Sagebrush/Mesic Mtn Shrub Mix	21
		Sedge	338
		Shrub/Grass/Forb Mix	54,846
		Soil	499
		Sparse Grass (Blowouts)	21
		Sparse PJ/Shrub/Rock Mix	56,994
SubAlpine Shrub Community	273		
Subalpine Grass/Forb Mix	35,158		
Upland Willow/Shrub Mix	89		
Winterfat/Grass Mix	6,499		
Xeric Mountain Shrub Mix	18		
Forest	313,560	Aspen	48,426
		Bristlecone Pine	2,915
		Cottonwood	7,986
		Douglas Fir	39,779
		Douglas Fir/Aspen Mix	7,144
		Douglas Fir/Englemann Spruce Mix	6
		Englemann Spruce/Fir Mix	73,946
		Limber Pine	1
		Lodgepole Pine	18,919
		Lodgepole Pine/Aspen Mix	3,031
		Lodgepole/Spruce/Fir Mix	29
		Ponderosa Pine	39,546
		Ponderosa Pine/Douglas Fir Mix	31,510
		Spruce/Fir/Aspen Mix	27,153
		Spruce/Fir/Lodgepole/Aspen Mix	6,534
Spruce/Lodgepole Pine Mix	3,640		
Willow	2,993		
Riparian	31,850	Herbaceous Riparian	31,416
		Shrub Riparian	433
Water	670	Water	670
Other	19,154	Commercial	26
		Residential	170
		Rock	18,896
		Sand Dune Complex	17
		Snow	1
		Talus Slopes & Rock Outcrops	2
No Data	41		
		Total Watershed Acres	858,973



PRECIPITATION TOTALS IN CENTER, CO
June - September



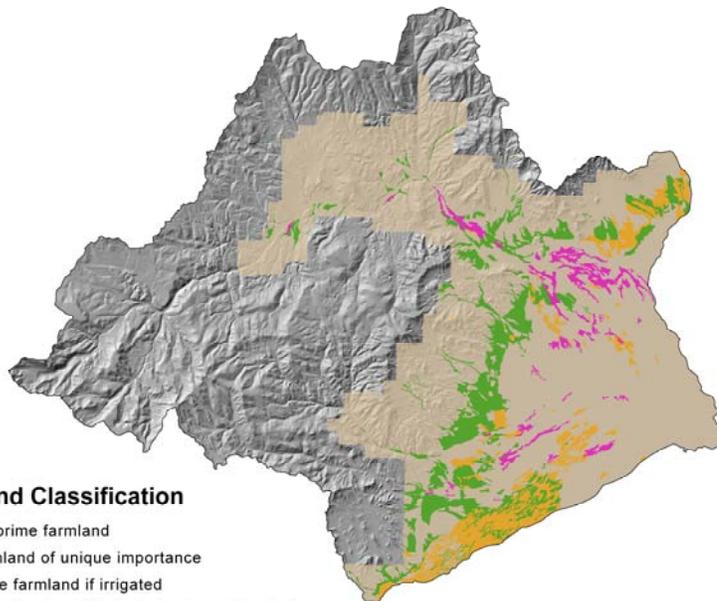
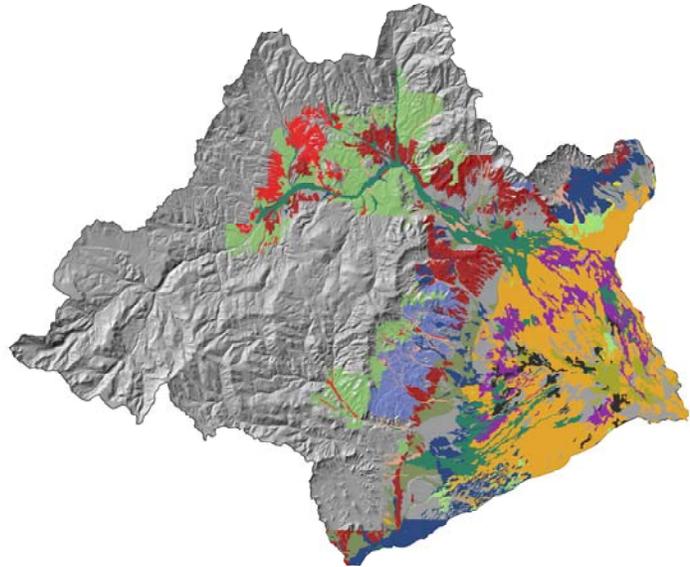
Ecological Sites

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/>.

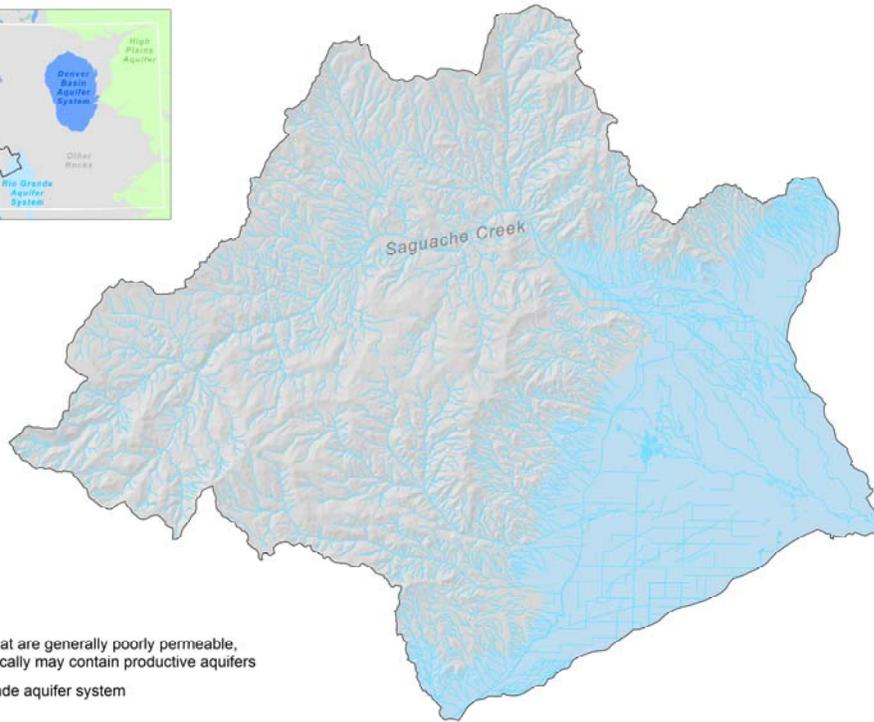
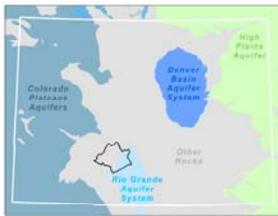
Soil: Ecological Site Names

- | | |
|-----------------------|-----------------|
| ◆ Alkali Overflow | ◆ Salt Flats |
| ◆ Basalt Hill | ◆ Salt Meadow |
| ◆ Foothill Loam | ◆ Sand Hummocks |
| ◆ Foothill Sand | ◆ Sandy Bench |
| ◆ Limy Bench | ◆ Shallow Loam |
| ◆ Mountain Loam 10-14 | ◆ Valley Sand |
| ◆ Mountain Outwash | ◆ Wet Meadow |
| ◆ Rocky Foothills | ◆ No Data |



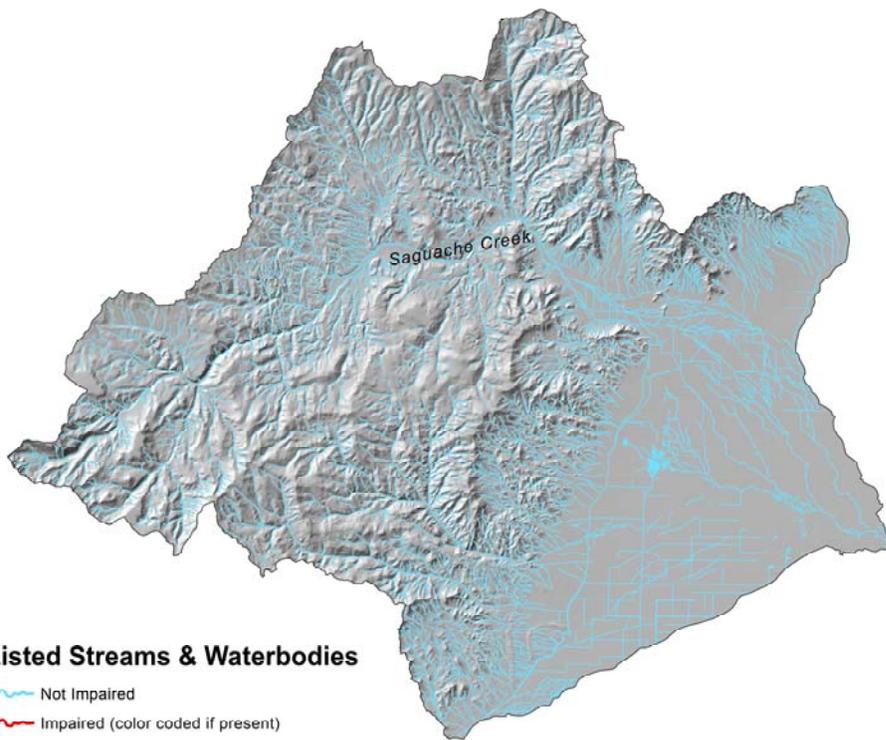
Farmland Classification

- ◆ Not prime farmland
- ◆ Farmland of unique importance
- ◆ Prime farmland if irrigated
- ◆ Prime farmland if irrigated and reclaimed of excess salts and sodium



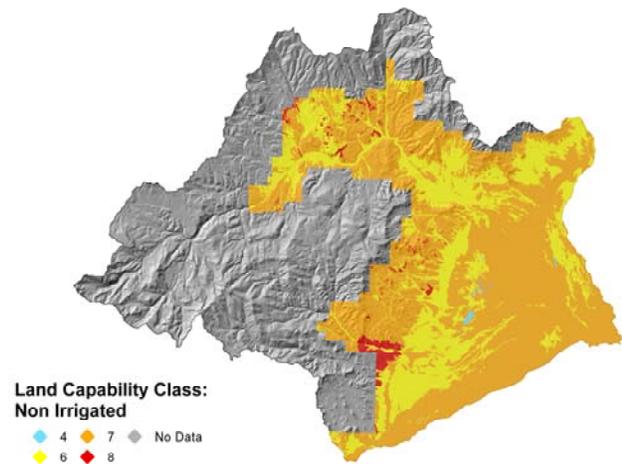
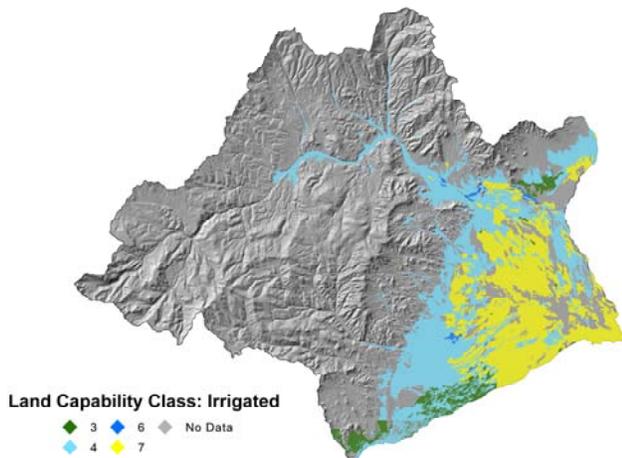
Aquifer

-  Rocks that are generally poorly permeable, but locally may contain productive aquifers
-  Rio Grande aquifer system



303(d) Listed Streams & Waterbodies

-  Not Impaired
-  Impaired (color coded if present)



Land Capability Classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive land-forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use.

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.

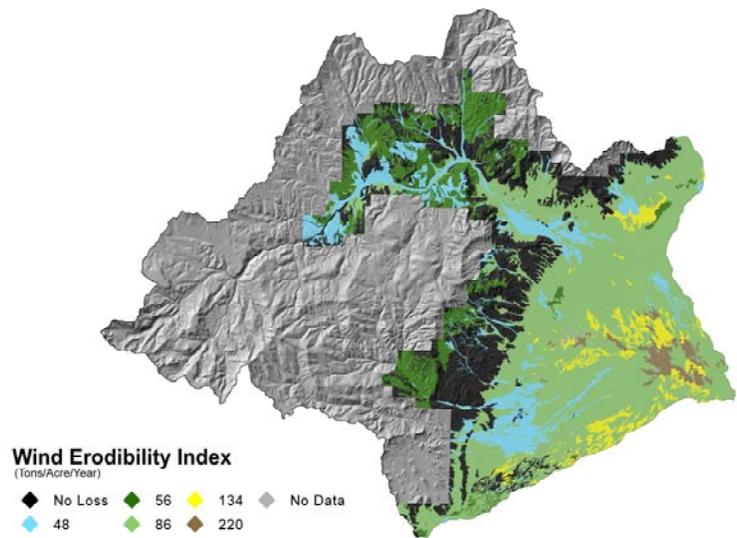
Class 7 - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

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.

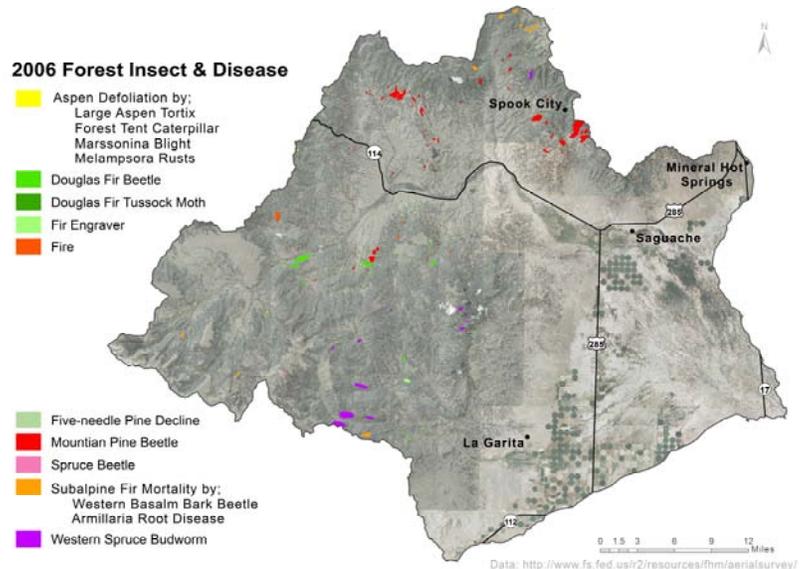
As shown on the Wind Erodibility Index map below, most soils in the Saguache Watershed are considered highly erodible.



This map shows stream locations within the watershed that are listed on the 303d list. 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.

Impairment Definition

Selenium: A naturally occurring metal in marine shale that serves as a micronutrient. Excessive amounts impair aquatic life and bioaccumulation up the food chain occurs causing toxicity to birds, mammals, and humans.



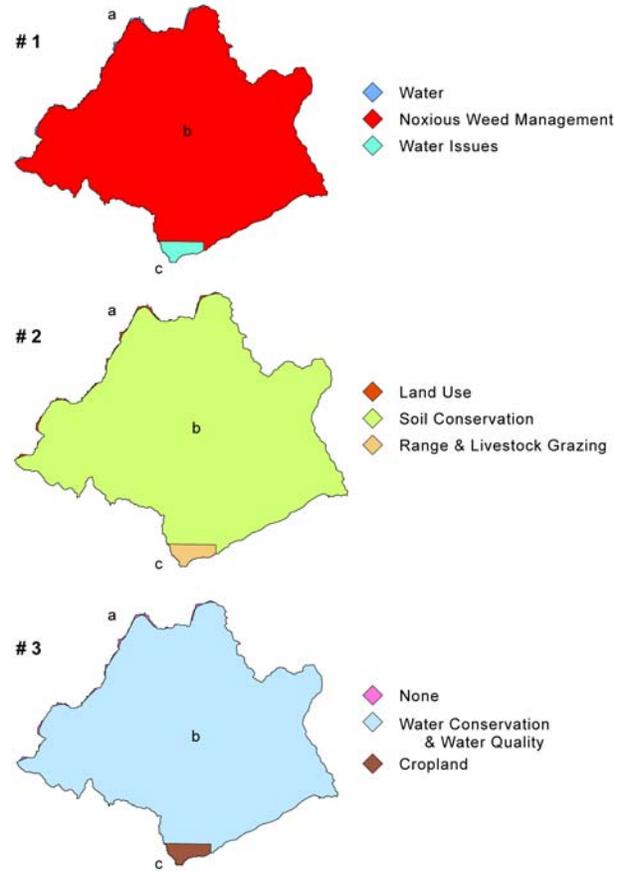
Saguache Watershed Natural Resource Concerns

Map Legend—Conservation Districts

- b. Center Conservation District
- c. Rio Grande Conservation District

Note: The Colorado Conservation Districts identified and prioritized these resource concerns during facilitated public meetings and are included in their Long Range Plans.

Identified Long Range Resource Concerns Top Three Concerns within Conservation Districts



State and Federal Threatened, Endangered, Candidate Species, and Species of Special Concern

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
Arkansas Darter	<i>Etheostoma cragini</i>	Fish	Threatened/Candidate	Occurs in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	May migrate through watershed and may winter near Arkansas River
Black-footed Ferret	<i>Mustela nigripes</i>	Mammals	Endangered/Endangered	No current records of occurrence
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	Mammals	Concern/None	Occurs in the watershed
Burrowing Owl	<i>Athene cunicularia</i>	Birds	Threatened/None	Occurs in the watershed
Couch's Spadefoot Toad	<i>Scaphiopus couchii</i>	Amphibians	Concern/None	May occur in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern/None	Occurs in the watershed
Lesser Prairie Chicken	<i>Tympanuchus pallidicinctus</i>	Birds	Threatened/Candidate	Not currently known in the watershed
Long-Billed Curlew	<i>Numenius americanus</i>	Birds	Concern/None	Occurs in the watershed
Massasauga	<i>Sistrurus catenatus</i>	Reptiles	Concern/None	Occurs in the watershed
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
Plains Leopard Frog	<i>Rana blairi</i>	Amphibians	Concern/None	Occurs in the watershed
Swift fox	<i>Vulpes velox</i>	Mammals	Concern/None	Occurs in the watershed
Yellow mud turtle	<i>Kinosternon flavescens</i>	Reptiles	Concern/None	Occurs in the watershed
Suckermouth minnow	<i>Phenacobius mirabilis</i>	Fish	Endangered/None	May occur in the watershed
Flathead chub	<i>Platygobio gracilus</i>	Fish	Concern/None	May occur in the watershed

Shortgrass prairie is the dominant terrestrial habitat type in this watershed. Burrowing owl, mountain plover, black-tailed prairie dog, massasauga, and swift fox are representative species for this habitat. Water is scarce and the native species in this watershed are those that can survive without abundant water supplies. Riparian areas, playa lakes, and the occasional stock pond provide seasonal to intermittent aquatic habitats. Economically important wildlife species that occur in the watershed include black bullhead, sunfish, pronghorn (antelope), mule and white-tailed deer, and scaled quail.

Social Data	Rio Grande	Saguache
Demographics (US Census, American Factfinder)		
Total population	12,413	5,917
Male	6,116	2,984
Female	6,297	2,933
Median age (years)	37.3	36.9
White	9,177	4,218
Black or African American	43	7
American Indian and Alaska Native	157	122
Asian	28	27
Native Hawaiian and Other Pacific Islander	3	0
Some other race	2662	1361
Hispanic or Latino (of any race)	5172	2678
Economic Characteristics (US Census, American Factfinder)		
In labor force (population 16 years and over)	5,732	2,666
Median household income (dollars)	31,836	25,495
Median family income (dollars)	36,809	29,405
Per capita income (dollars)	15,650	13,121
Families below poverty level	385	291
Individuals below poverty level	1769	1325
X means that value is not applicale or not avaiilable		
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)		
Farms (number)	344	252
Land in farms/ranches (acres)	170,999	477,003
Average size farm/ranch (acres)	497	1,893
Median size farm (acres)	280	640
Average age of farmer or rancher	54.2	54.1
Net cash return from ag sales (\$1,000)	25,647	24,040
Cattle and calves (number)	12,000	20,000

Selected Conservation Application Data							
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	81,742	66,539	na	198,857	29,315	137,270	513,723
Total Conservation Systems Applied (Acres)	80,003	111,126	na	192,470	17,025	125,891	526,515
Practices							
Prescribed Grazing	69,151	21,061	0	178,982	10,113	117,566	382,628
Upland Wildlife Habitat Management	209	13,587	0	49,014	291	119	63,220
Conservation Cropping System	na	na	130	6,241	1,251	322	7,944
Irrigation Water Management	1,254	4,386	0	7,792	1,306	727	15,465

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 35,000 acres need to be treated on median sized ranches of 1,200 acres.			Based on Conservation System Guide Code: CO 51.1-GR-01-R-Grazing
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost per Median Sized Ranch (\$)
Prescribed Grazing				
Fence (382)	Ft.	8,000	0.6	4,800
Pest Management (595)	Ac.	600	15	9,000
Pipeline (516)	Ft.	12,000	1.05	12,600
Upland Wildlife Habitat Management (645)	Ac.	300	na	0
Watering Facility (614)	No.	2	500	1,000
Windbreak/Shelterbelt Establishment (380)	Ft.	2,000	.35	700
Subtotal: Costs to apply prescribed grazing per median sized ranch of 1,200 acres	No.	29	28,100	\$814,900

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, Mulch-till, Nutrient and Pest Mgt.		Reference Conservation System Guide Code: CO 51.1-CR-Sprinkler-R-2
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation Water Management (449)* * includes re-bowl, Renozzle, and IWM	Ac	30,000	10.20	306,000
Nutrient Management (590)	Ac	30,000	5	150,000
Pest Management (595)	Ac	30,000	15	450,000
Subtotal Irrigated Crops:				\$906,450

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.	\$814,900
Irrigated Crop	Water		Nutrients and organics are stored, handled, disposed of, and managed so that surface water uses are not adversely affected.	\$906,450
Estimated Total Costs to Address Major Resource Concerns:				\$1,721,350

References Not Cited in Document

303(d) listed streams within Big Sandy 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>.

Threatened and Endangered Species information was gathered using data from the Colorado Division of Wildlife (CDOW) Natural Diversity Information Source (NDIS).

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:

Rio Grande County Area (CO631) Published 01/16/2007

Saguache County Area (CO633) Published 01/08/2007

Vegetation data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. 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. 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 visit <http://www.ncgc.nrcs.usda.gov/products/datasets/climate/docs/fact-sheet.html> or <http://www.ocs.orst.edu/prism>.

Land Ownership (status, 2004 dataset) data was obtained from the Colorado Department of Transportation (CDOT). For more information, visit <http://www.dot.state.co.us>.

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>.

Conservation Systems to address major resource concerns were extracted from the Conservation Systems Guides (CSG) compiled from local conservationists by the NRCS Ecological Sciences Section at the Lakewood State Office.

Effects and Impacts of application of conservation systems were extracted from Colorado eFOTG, Section III, Resource Quality Criteria, NRCS, Colorado, March 2005.

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