



United States Department  
of Agriculture

# Conejos Watershed



Hydrologic Unit Code 13010005

Natural Resources  
Conservation Service

## Rapid Assessment

Lakewood, Colorado

RWA 13010005

December 2008



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

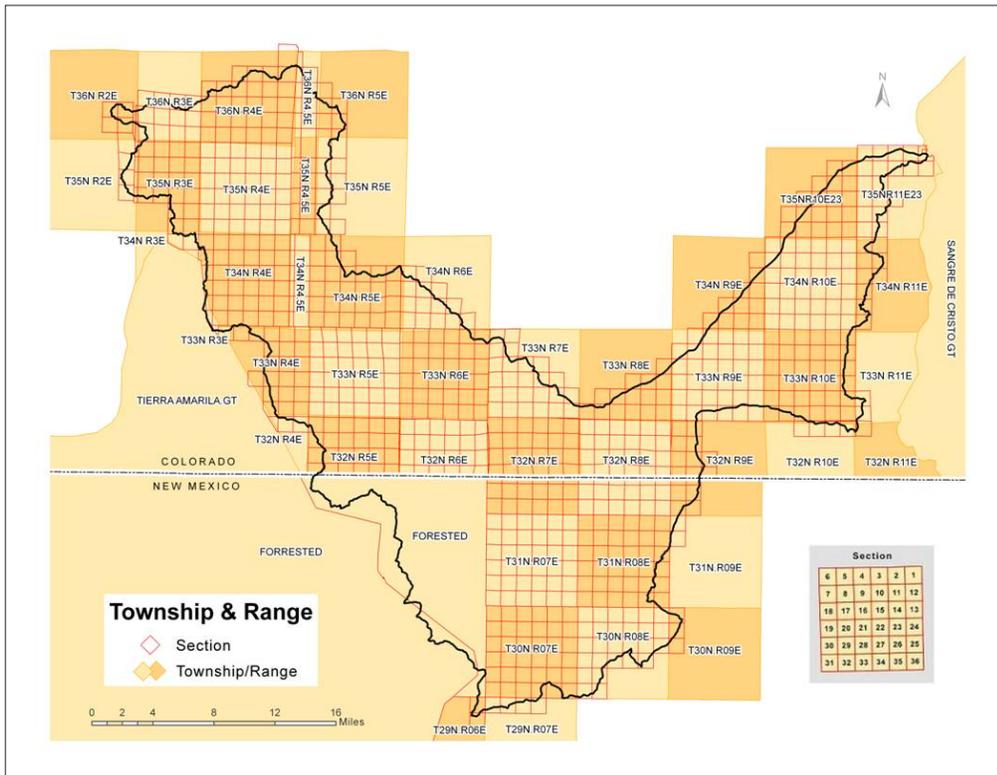
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

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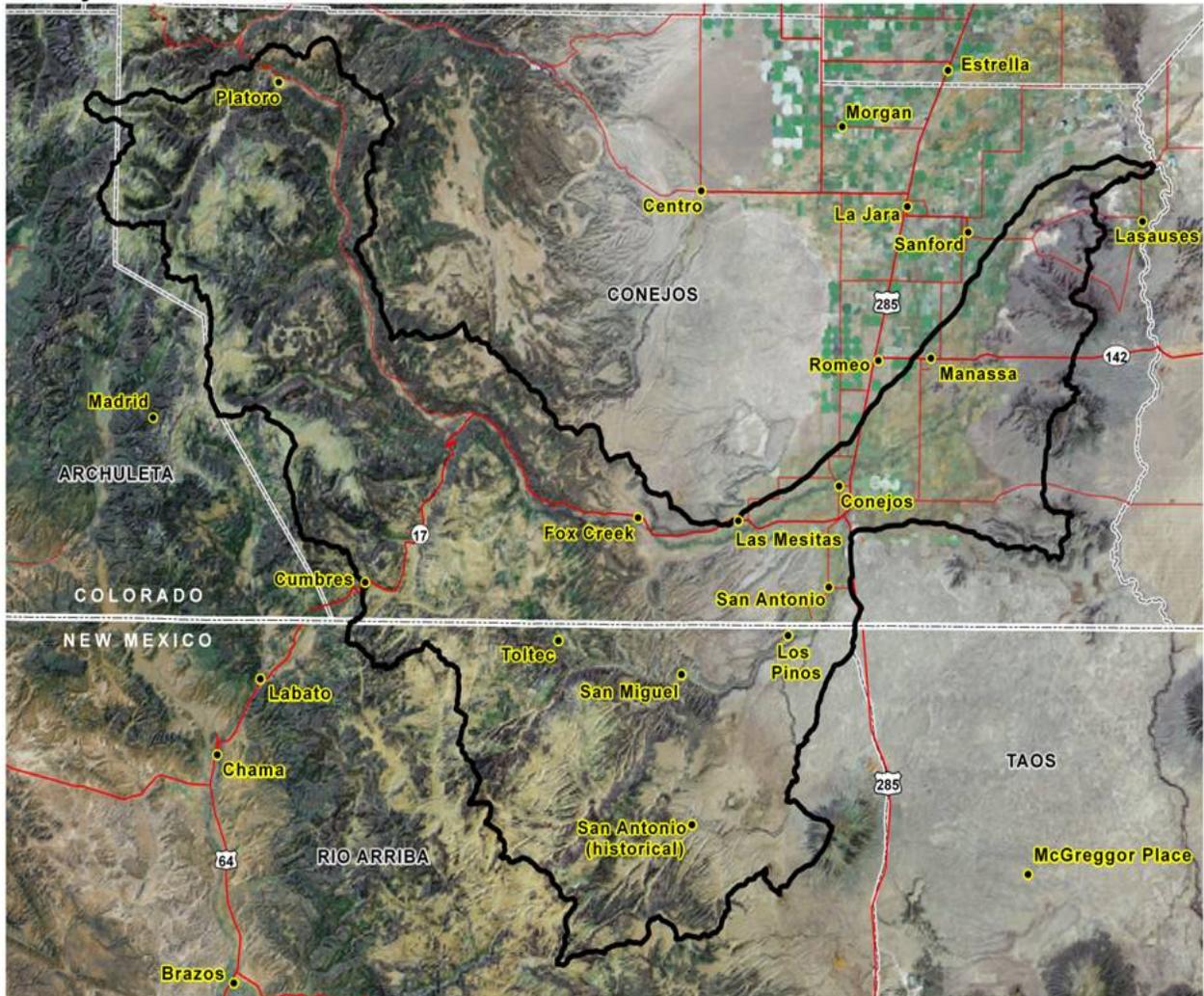
**Rapid Watershed Assessments provide information that helps landowners and local leaders set conservation priorities.**

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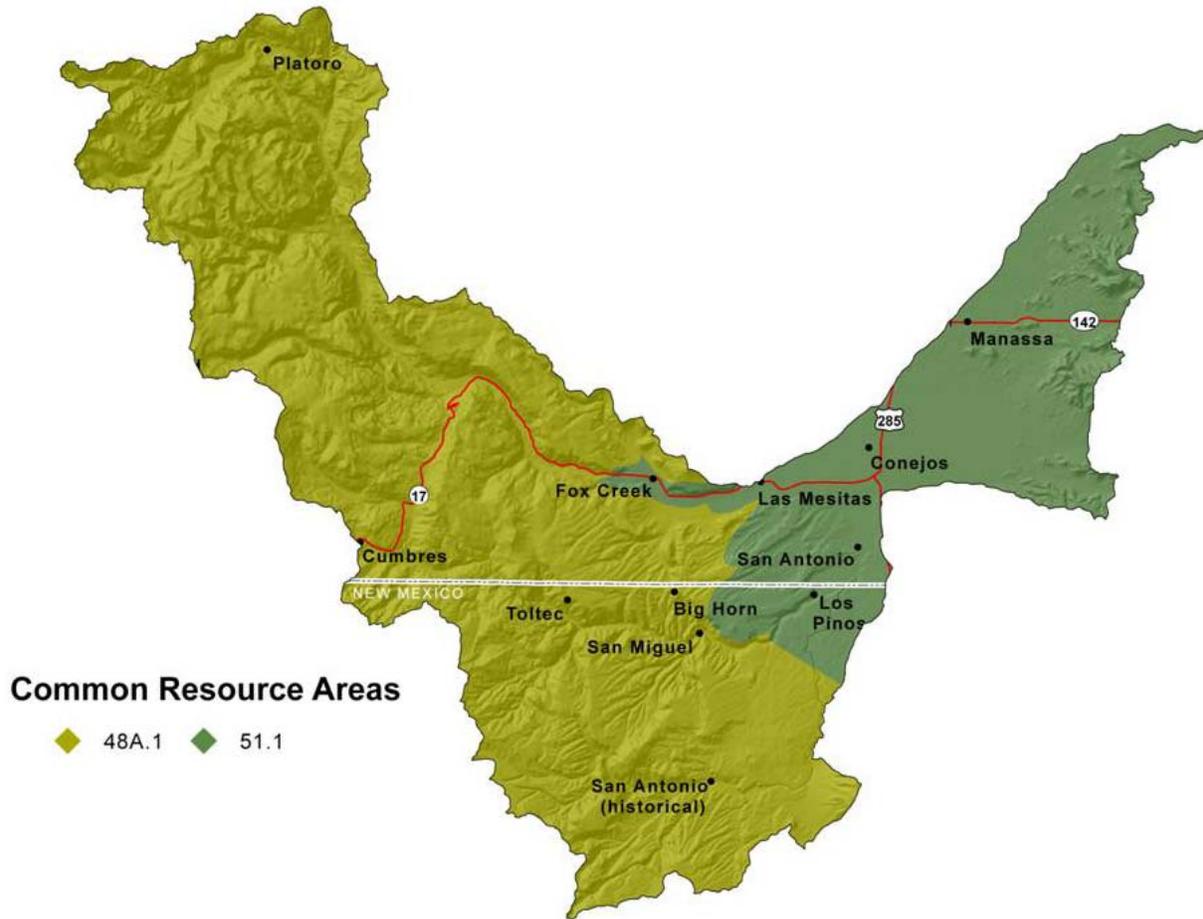


County	County Acres	County Acres in CONEJOS Watershed	% of County in the Watershed	% of Watershed in the County
Archuleta	866,798	1,824	0.21%	0.53%
Conejos	825,714	340,779	41.27%	99.47%
		342,603		

### Conejos Watershed - 13010005



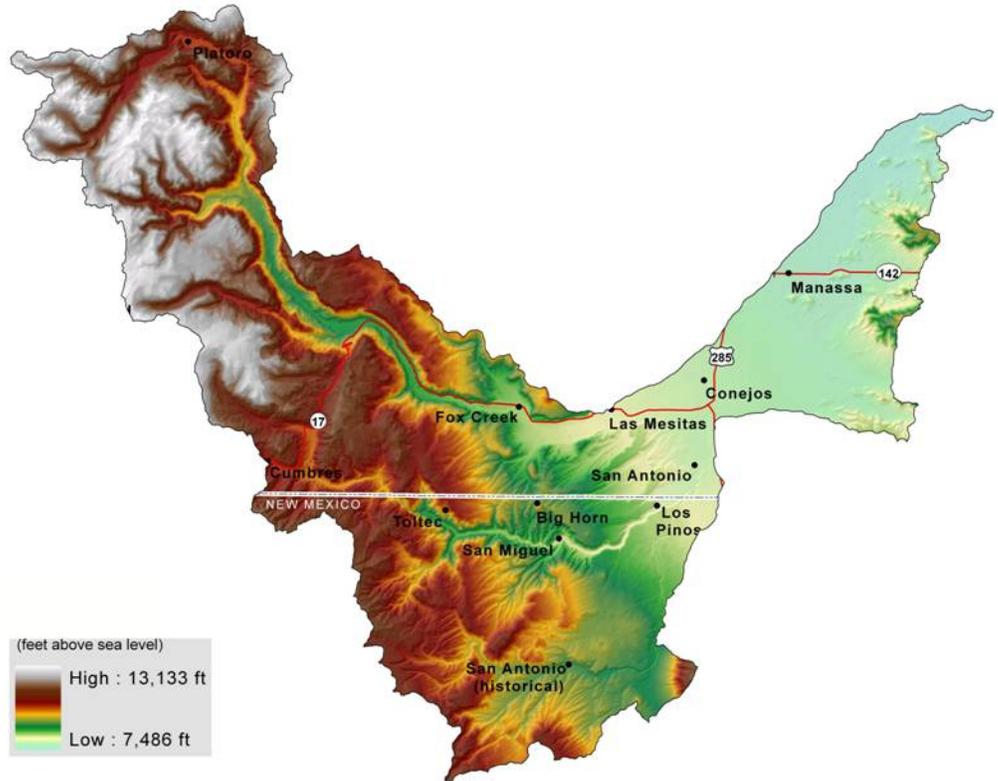
Satellite Imagery: Arc IMS Server - Geographic Network Services hosted by ESRI



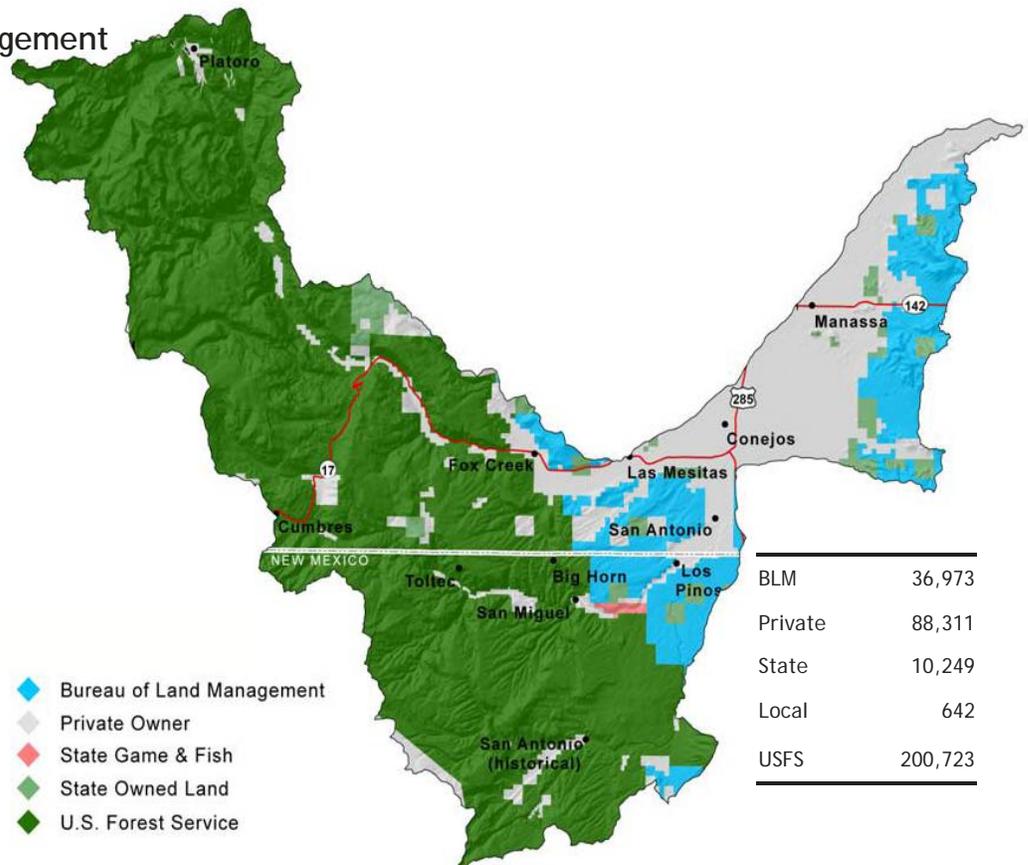
Common Resource Areas (CRA): Geographical areas where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

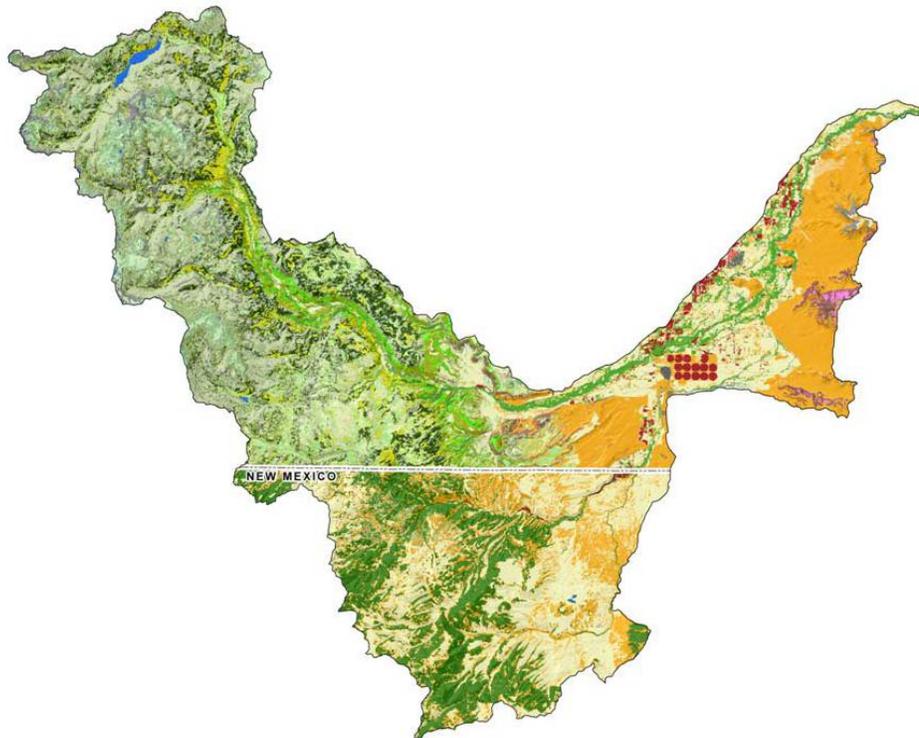
<u>MLRA</u>	<u>CRA</u>	<u>CRA NAME</u>	<u>DESCRIPTION</u>
8A	48A.1	Southern Rocky Mountains - High Mountains and Valleys	This area is best characterized by steep, high mountain ranges and associated mountain valleys. The temperature regimes are mostly frigid and cryic; moisture regimes are mainly ustic 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.

## Elevation



## Land Ownership/Management





## Vegetation

### COLORADO - CVCP

- |                                    |                                  |
|------------------------------------|----------------------------------|
| ◆ Alpine Grass Dominated           | ◆ Ponderosa Pine                 |
| ◆ Alpine Grass/Forb Mix            | ◆ Ponderosa Pine/Aspen Mix       |
| ◆ Alpine Meadow                    | ◆ Ponderosa Pine/Douglas Fir Mix |
| ◆ Aspen                            | ◆ Rabbitbrush/Grass Mix          |
| ◆ Commercial                       | ◆ Residential                    |
| ◆ Cottonwood                       | ◆ Rock                           |
| ◆ Douglas Fir                      | ◆ Shrub Riparian                 |
| ◆ Douglas Fir/Aspen Mix            | ◆ Shrub/Brush Rangeland          |
| ◆ Douglas Fir/Englemann Spruce Mix | ◆ Shrub/Grass/Forb Mix           |
| ◆ Englemann Spruce/Fir Mix         | ◆ Soil                           |
| ◆ Forested Riparian                | ◆ Sparse PJ/Shrub/Rock Mix       |
| ◆ Grass Dominated                  | ◆ Spruce/Fir/Aspen Mix           |
| ◆ Grass/Forb Mix                   | ◆ SubAlpine Shrub Community      |
| ◆ Greasewood                       | ◆ Subalpine Grass/Forb Mix       |
| ◆ Herbaceous Riparian              | ◆ Upland Willow/Shrub Mix        |
| ◆ Irrigated Ag                     | ◆ Urban/Built Up                 |
| ◆ Pinon-Juniper                    | ◆ Water                          |
|                                    | ◆ Willow                         |

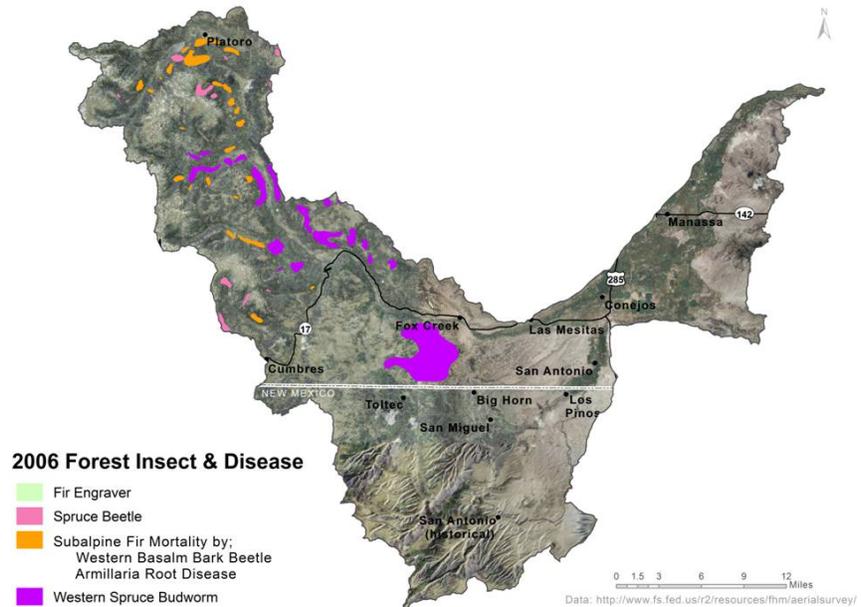
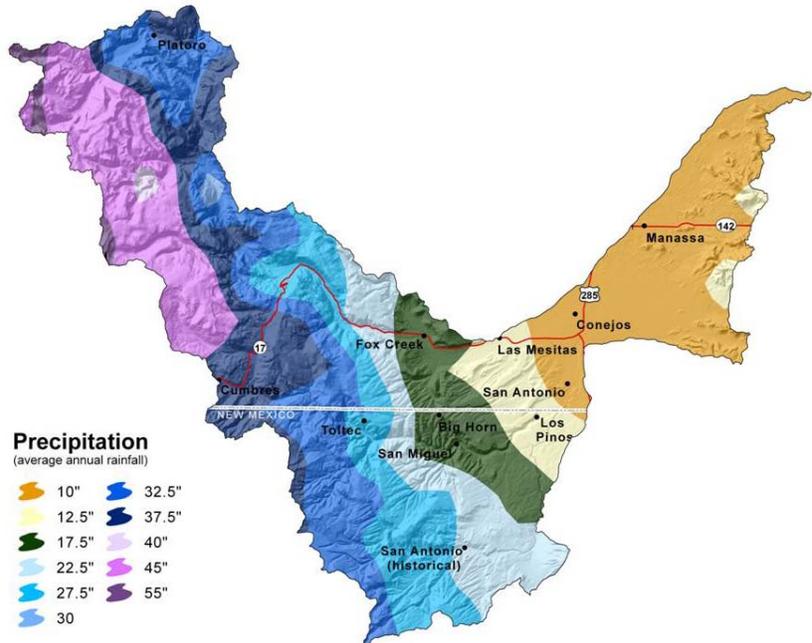
### NEW MEXICO - NLCD

- |                             |                                |
|-----------------------------|--------------------------------|
| ◆ Water                     | ◆ Mixed Forest                 |
| ◆ Low Intensity Residential | ◆ Shrubland                    |
| ◆ Bare Rock/Sand/Clay       | ◆ Grasslands/Herbaceous        |
| ◆ Transitional              | ◆ Pasture/Hay                  |
| ◆ Deciduous Forest          | ◆ Row Crops                    |
| ◆ Evergreen Forest          | ◆ Emergent Herbaceous Wetlands |

CONEJOS Colorado Land Use	Total Acreage	Vegetation (CVCP)	Acreage
Cropland	5,704	Irrigated Ag	5,704.1
Rangeland/Grassland	163,362	Alpine Meadow	290.3
		Alpine Grass Dominated	10,732.1
		Alpine Grass/Forb Mix	8,913.5
		Grass Dominated	52,722.4
		Grass/Forb Mix	0.8
		Greasewood	1,494.0
		Pinon-Juniper	1,073.3
		Rabbitbrush/Grass Mix	52,822.4
		Shrub/Brush Rangeland	87.4
		Shrub/Grass/Forb Mix	1,636.5
		Sparse PJ/Shrub/Rock Mix	5,414.0
		SubAlpine Shrub Community	2,940.7
		Subalpine Grass/Forb Mix	20,458.8
Upland Willow/Shrub Mix	4,775.3		
Forest	152,308	Aspen	17,690.7
		Cottonwood	13,353.9
		Douglas Fir	2,048.3
		Douglas Fir/Aspen Mix	5,314.0
		Douglas Fir/Englemann Spruce Mix	48.9
		Englemann Spruce/Fir Mix	62,631.7
		Ponderosa Pine	5,930.1
		Ponderosa Pine/Aspen Mix	1,351.3
		Ponderosa Pine/Douglas Fir Mix	7,478.6
		Spruce/Fir/Aspen Mix	36,394.3
Willow	66.0		
Riparian	1,907	Forested Riparian	122.3
		Herbaceous Riparian	295.1
		Shrub Riparian	1,489.3
Water	1,829	Water	1,829.1
Other	16,215	Commercial	9.7
		Residential	127.5
		Rock	15,363.5
		Soil	225.3
		Urban/Built Up	489.5
<b>Total Colorado Conejos Watershed Acres</b>			<b>341,325</b>

## Precipitation

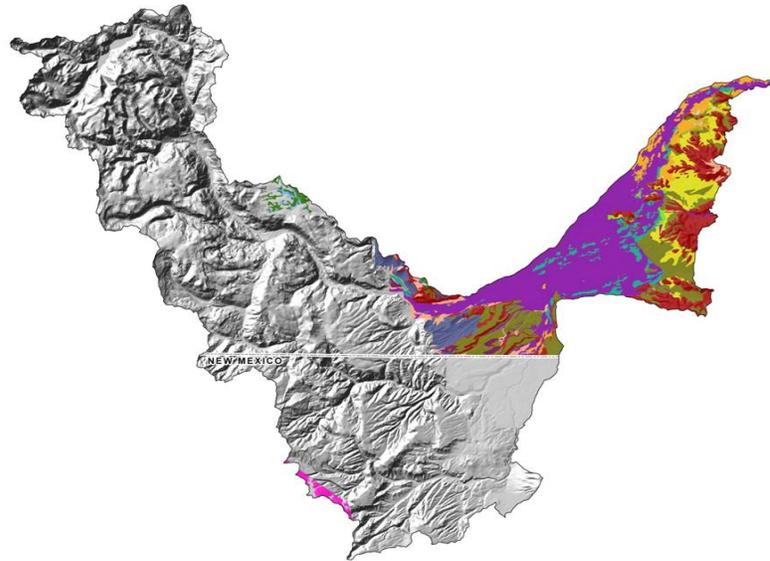
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series 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. Rainfall occurs as frontal storms in the spring and early summer and high intensity, convective thunderstorms in summer. Maximum precipitation is from mid spring through late autumn. Precipitation in winter is snow.



## Ecological Sites

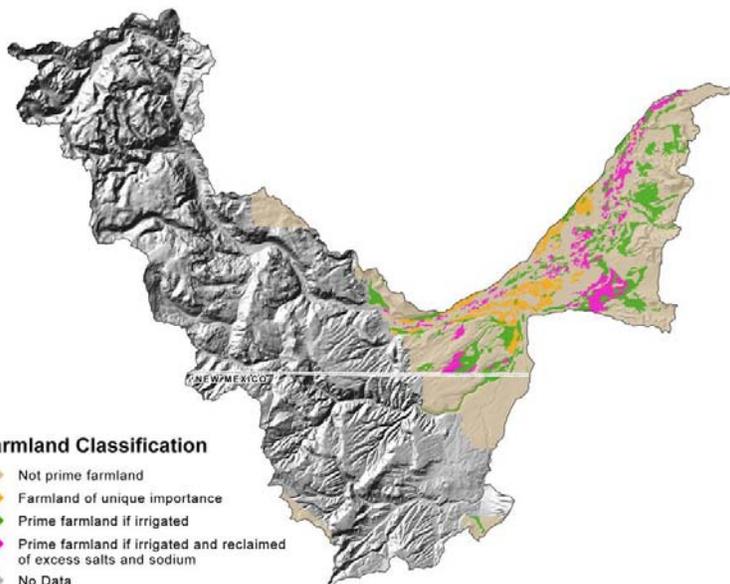
The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

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/>.



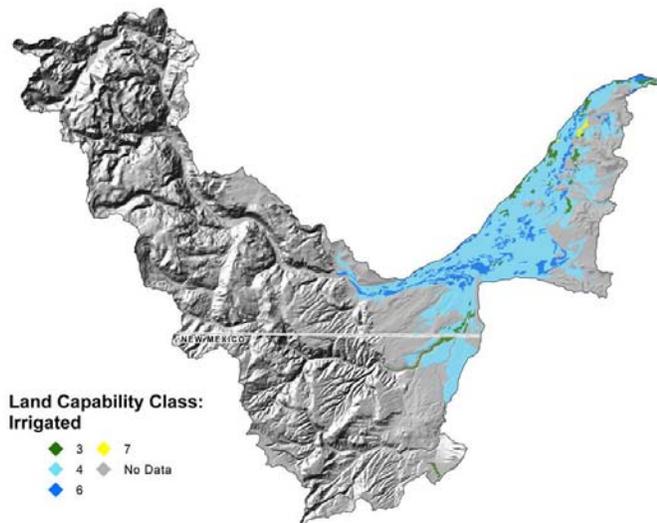
### Soil: Ecological Site Names

- |  |                  |
|--|------------------|
| ◆ Basalt Hill                                  | ◆ Sand Hummocks  |
| ◆ Desert Salty Silt (Pickleweed)               | ◆ Sandy Bench    |
| ◆ Foothill Loam                                | ◆ Shallow Loam   |
| ◆ Limy Bench                                   | ◆ Subalpine Loam |
| ◆ Pinus engelmannii-Abies lasiocarpa/Vaccinium | ◆ Valley Bench   |
| ◆ Rocky Foothills                              | ◆ Valley Sand    |
| ◆ Salt Flats                                   | ◆ Wet Meadow     |
| ◆ Salt Meadow                                  | ◆ No Data        |



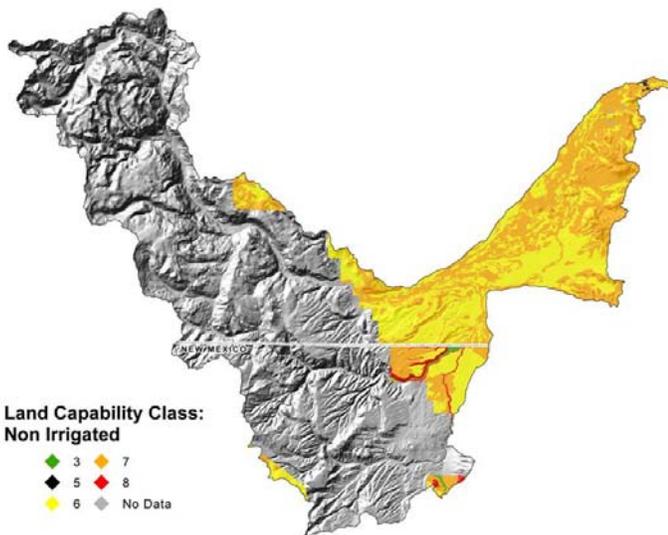
### Farmland Classification

- |  |
|--|
| ◆ Not prime farmland   |
| ◆ Farmland of unique importance  |
| ◆ Prime farmland if irrigated  |
| ◆ Prime farmland if irrigated and reclaimed of excess salts and sodium |
| ◆ No Data  |



**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.

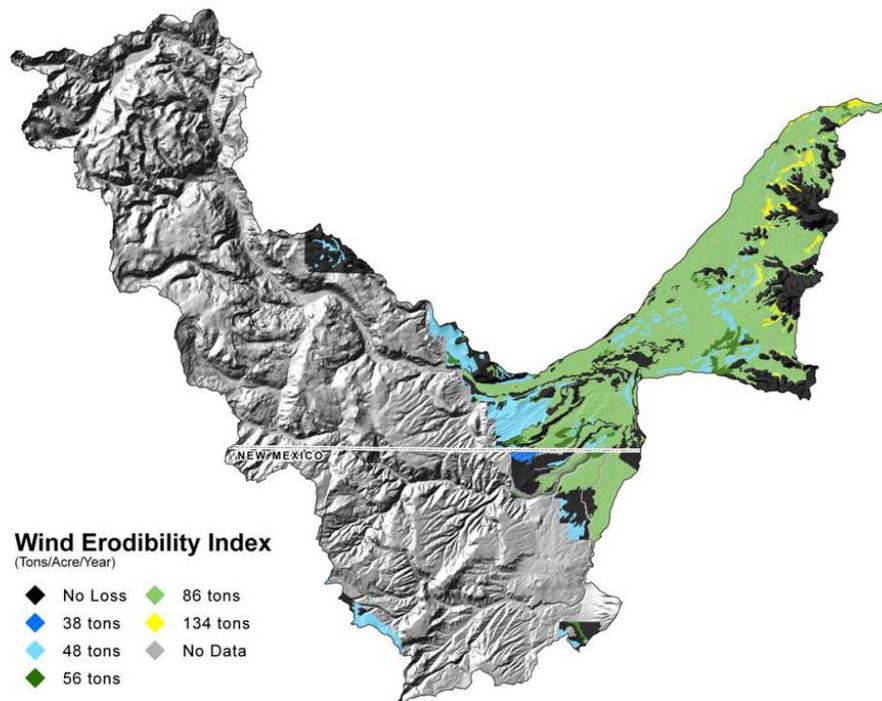
**Class 7** - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

**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.

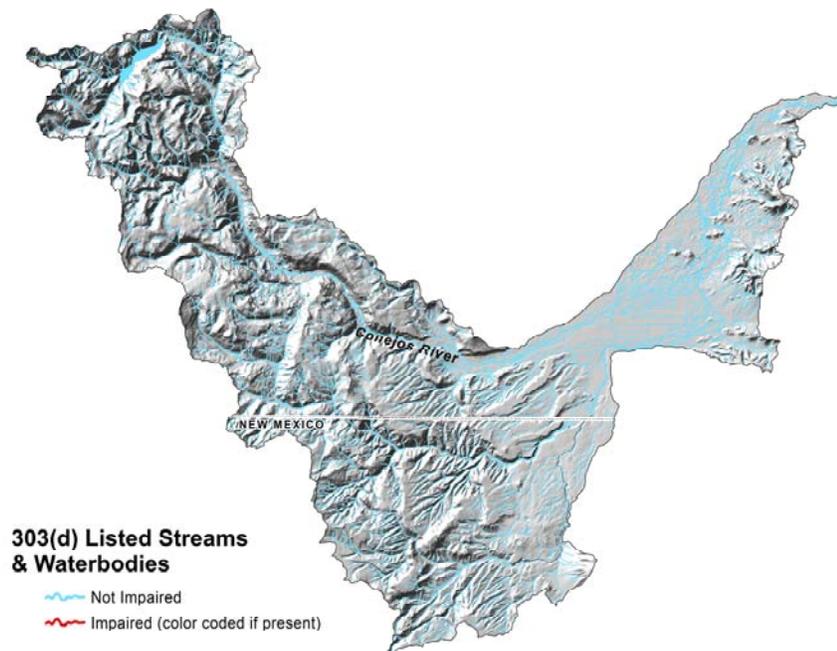
The Wind Erodibility Index (WEI), is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion if it is assumed there is no vegetative cover or management.

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 Conejos 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.



## State and Federal Threatened, Endangered, and Candidate Species and 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 and nests in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Winters and nests in the watershed
Black-footed Ferret	<i>Mustela nigripes</i>	Mammals	Endangered/Endangered	Suitable habitat in watershed; Extirpated
Boreal Toad	<i>Bufo boreas boreas</i>	Amphibians	Endangered/None	Occurs in the watershed
Burrowing Owl	<i>Athene cunicularia</i>	Birds	Threatened/None	May occur in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	Occurs in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern/None	Occurs in the watershed
Greater Sandhill Crane	<i>Grus canadensis tabida</i>	Birds	Concern/None	Occurs in the watershed
Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	Mammals	None/Candidate	Occurs in the watershed
Long-billed curlew	<i>Numenius americanus</i>	Birds	Concern/	May occur in the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	May occur 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
Rio Grande Chub	<i>Gila pandora</i>	Fish	Concern/None	Occurs in the watershed
Rio Grande Cutthroat Trout	<i>Oncorhynchus clarki virginialis</i>	Fish	Concern/None	Occurs in the watershed
Rio Grande Sucker	<i>Catostomus plebeius</i>	Fish	Endangered/None	Occurs in the watershed
Southwestern Willow Flycatcher	<i>Empidonax traillii eximius</i>	Birds	Endangered/Endangered	Occurs in the watershed
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/None	Occurs in the watershed
Western Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Birds	Concern/Candidate	Occurs in the watershed
Wolverine	<i>Gulo gulo</i>	Mammals	Endangered/None	Suitable habitat in watershed; No current records of occurrence

The terrestrial habitats in this watershed include desert shrub and grassland; cropland; foothills, montane, and sub-alpine shrub and forest; and alpine tundra. Riparian areas and wetlands provide important aquatic habitats for a number of species providing food, cover, or water at some life stage.

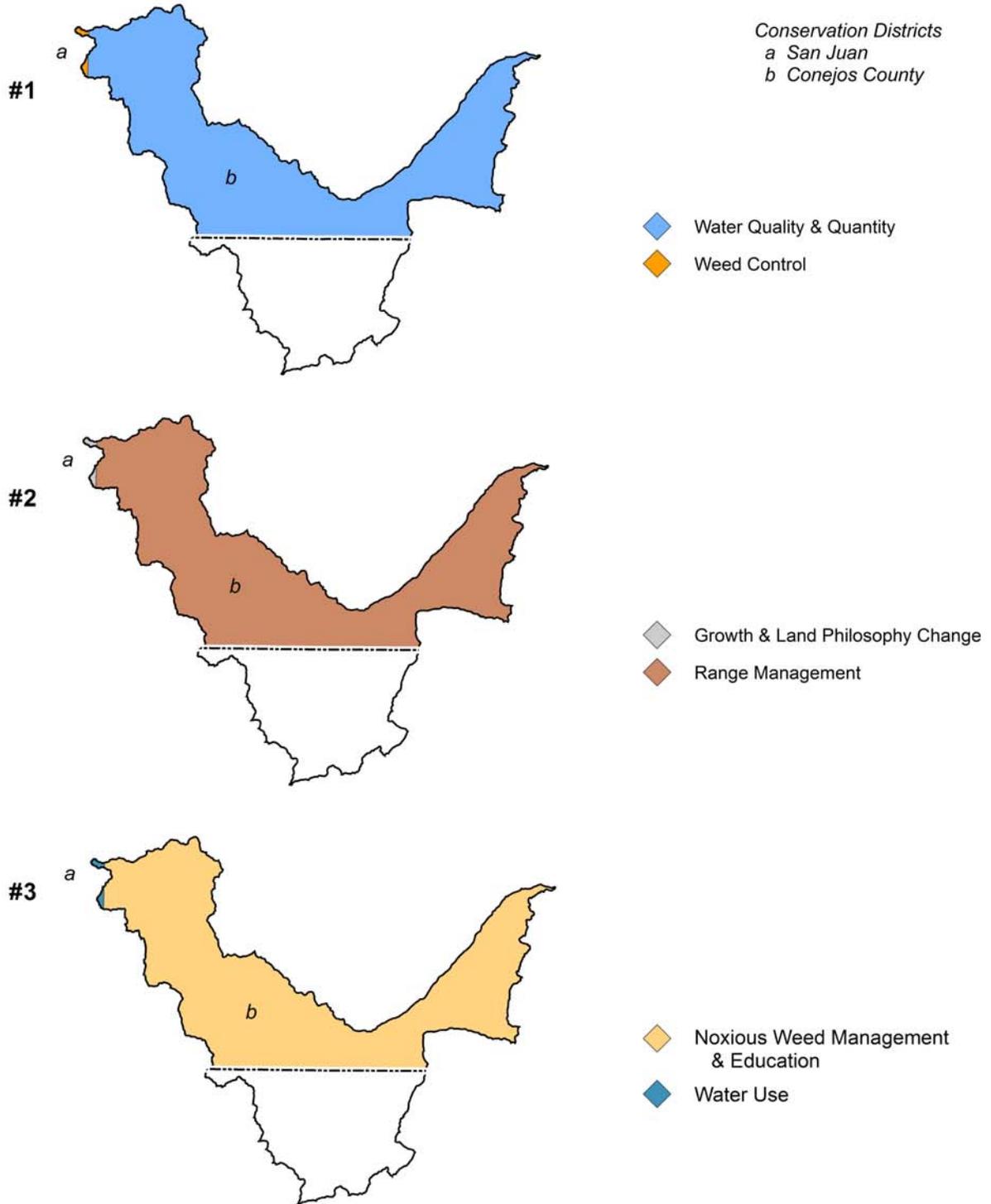
Wildlife found at the highest elevations in the watershed include pika, marmot, lynx, bighorn sheep, and white-tailed ptarmigan.

Economically important species in the watershed include: black bear, elk, mule deer, mountain lion, and trout, throughout most of the watershed and pronghorn (antelope) in lower elevation shrub and grasslands. Wild turkey are found in the south part of the watershed. Irrigated cropland areas in the eastern part of the watershed provide winter and breeding habitat for snow geese and important stop over areas for migrating sandhill cranes. Even though they are a non-game species, sandhill cranes are economically important because of the tourism dollars they attract to the San Luis Valley

Social Data	Archuleta	Conejos
<b>Demographics (US Census, American Factfinder)</b>		
Total population	9,898	8,400
Male	5,016	4,169
Female	4,882	4,231
Median age (years)	40.8	34.2
American Indian and Alaska Native	139	142
Asian	31	13
Native Hawaiian and Other Pacific Islander	3	6
Some other race	690	1806
Hispanic or Latino (of any race)	1659	4949
<b>Economic Characteristics (US Census, American Factfinder)</b>		
In labor force (population 16 years and over)	4,891	3,326
Median household income (dollars)	37,901	24,744
Median family income (dollars)	45,259	29,066
Per capita income (dollars)	21,683	12,050
Families below poverty level	261	414
Individuals below poverty level	1148	1918
<b>County Agricultural Characteristics (Colorado Agricultural Census, county data tables)</b>		
Farms (number)	258	494
Land in farms/ranches (acres)	103,075	267,708
Average size farm/ranch (acres)	400	542
Median size farm (acres)	177	240
Average age of farmer or rancher	55.1	53.9
Net cash return from ag sales (\$1,000)	504	4,882
Cattle and calves (number)	5,000	27,000

# Identified Long Range Resource Concerns

## Top Three Concerns within Conservation Districts



Selected Conservation Application Data		Conejos Watershed–13010005					
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	15,391	3,898	Not Avail.	11,235	22,457	9,573	62,554
Total Conservation Systems Applied (Acres)	3,522	2,331	Not Avail.	8,602	1,006	774	16,235
<b>Practices Applied</b>							
Prescribed Grazing	307	779	642	6,500	0	80	8,308
Upland Wildlife Habitat Management	360	400	642	0	0	9	1,411
Conservation Cropping System	0	0	432	1,227	34	146	1,839
Irrigation Water Management	481	333	0	0	64	117	995

### Conservation Systems to Address Major Resource Concerns

Primary Resource Concern: Rangeland Health				
Conservation System Description:			Based on Conservation System Guide Code:	
Prescribed Grazing—planned management that provides adequate recovery opportunity between grazing events and proper stocking of animals. Estimate 44,500 acres need to be treated on median sized ranches of 2,000 acres.			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
<b>Subtotal: Costs to apply prescribed grazing based on median sized ranch of 2000 acres</b>	<b>No.</b>	<b>22</b>	<b>28,100</b>	<b>Est. Total Rangeland Costs: \$618,200</b>

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

<b>Primary Resource Concern:</b> Water Quality				
<b>Conservation System Description:</b>		Upgrading Sprinkler irrigation system with IWM, Crop rotation, Nutrient and Pest Mgt.		<b>Reference Conservation System Guide Code:</b> CO 51.1-CR-Sprinkler-R-2
<b>Practices</b>	<b>Unit</b>	<b>Quantity</b>	<b>Cost/Unit (\$)</b>	<b>Estimated Cost (\$)</b>
Irrigation Water Management (449)* * includes re-bowl, renozzle, and IWM	Ac	3,000	10.20	30,600
Nutrient Management (590)	Ac	4,000	5	20,000
Pest Management (595)	Ac	4,000	15	60,000
<b>Conservation System Description:</b>		Surface irrigation converted to sprinkler system. Sprinkler irrigation system with IWM, Crop rotation, Nutrient and Pest Mgt.		<b>Reference Conservation System Guide Code:</b> CO 51.1-CR-Gravity-R-2
<b>Practices</b>	<b>Unit</b>	<b>Quantity</b>	<b>Cost/Unit (\$)</b>	<b>Estimated Cost (\$)</b>
Irrigation System, Sprinkler (442)	Ac	1,000	600	600,000
Irrigation Water Management (449)	Ac	1,000	5	5,000
Nutrient Management (590)	Ac	1,000	5	5,000
Land Leveling (464)	Ac	150	300	45,000
Pest Management (595)	Ac	900	15	360,000
Streambank and Shoreline Protection (580)	Ft	2,500	50	13,500
<b>Subtotal Irrigated Crops: \$1,139,100</b>				

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

Landuse	Resource	Measurable	Non-measurable Effects	Estimated Cost (\$)
Rangeland	Plants		Improved plant condition, productivity, health and vigor. Grazing animals have adequate feed, forage, and shelter.	618,200
Irrigated Crop	Water		Nutrients and organics are stored, handled, disposed of, and managed so that surface water uses are not adversely affected.	1,139,100
<b>Estimated Total Costs to Address Major Resource Concerns: \$1,757,300</b>				

## References Not Cited in Document

**303(d)** listed streams 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>.

**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:

Conejos County Area (CO630) Published 01/08/2007

Parts of Rio Arriba & Sandoval Counties (NM650) Published 04/15/2007

Parts of Rio Arriba & Mora Counties (NM670) Published 04/15/2007

**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 Lake-wood State Office.

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