



United States Department
of Agriculture

Rio Chama Watershed (NM)



Hydrologic Unit Code 13020102

Natural Resources
Conservation Service

Lakewood, Colorado

Rapid Assessment

RWA 13020102

July 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.

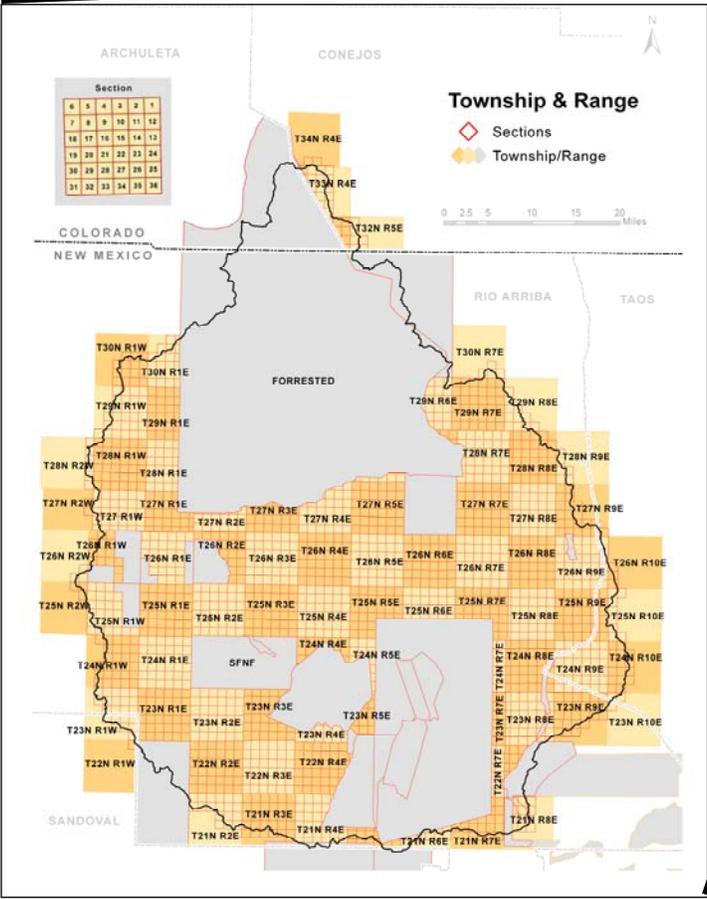
Benefits of these Activities

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)

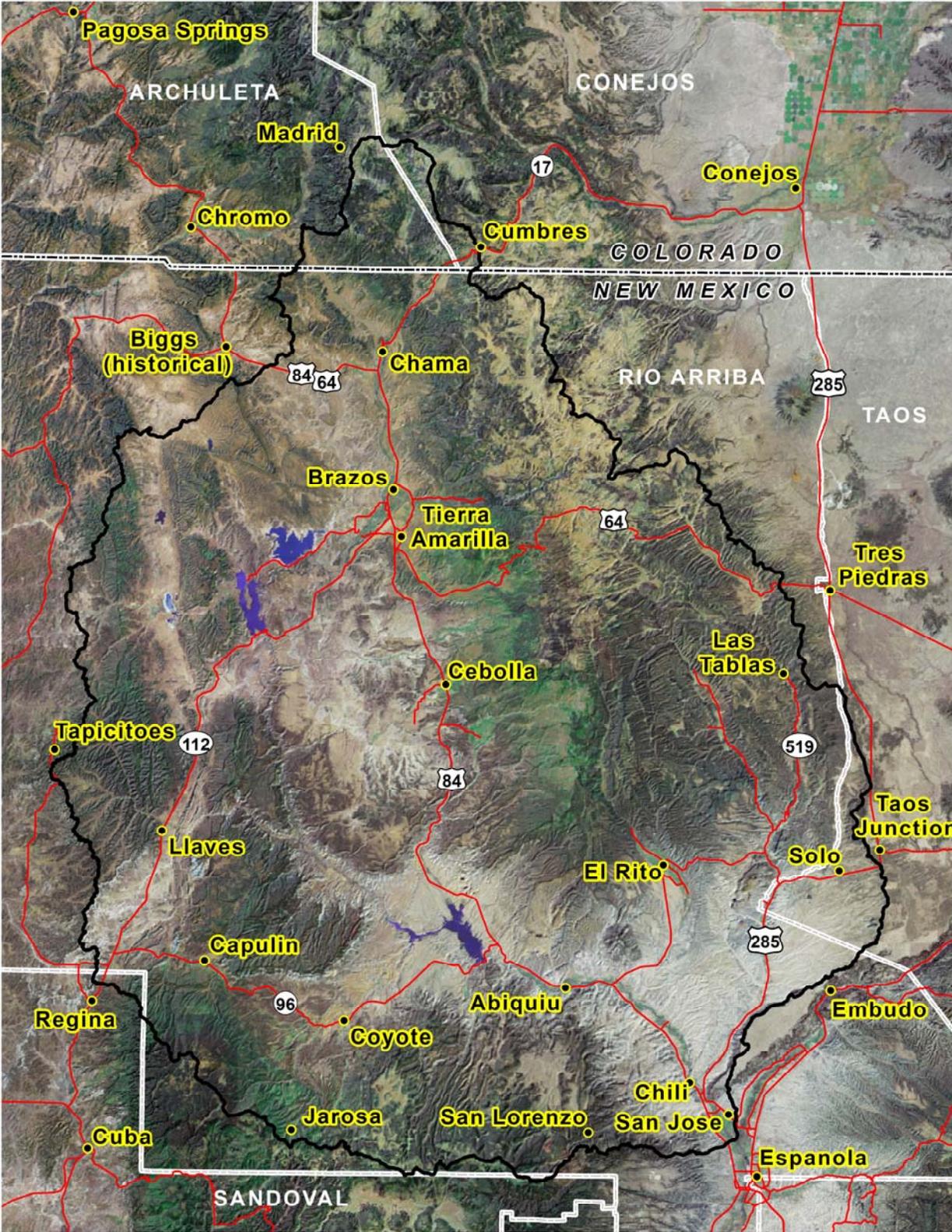
Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

Watershed Overview

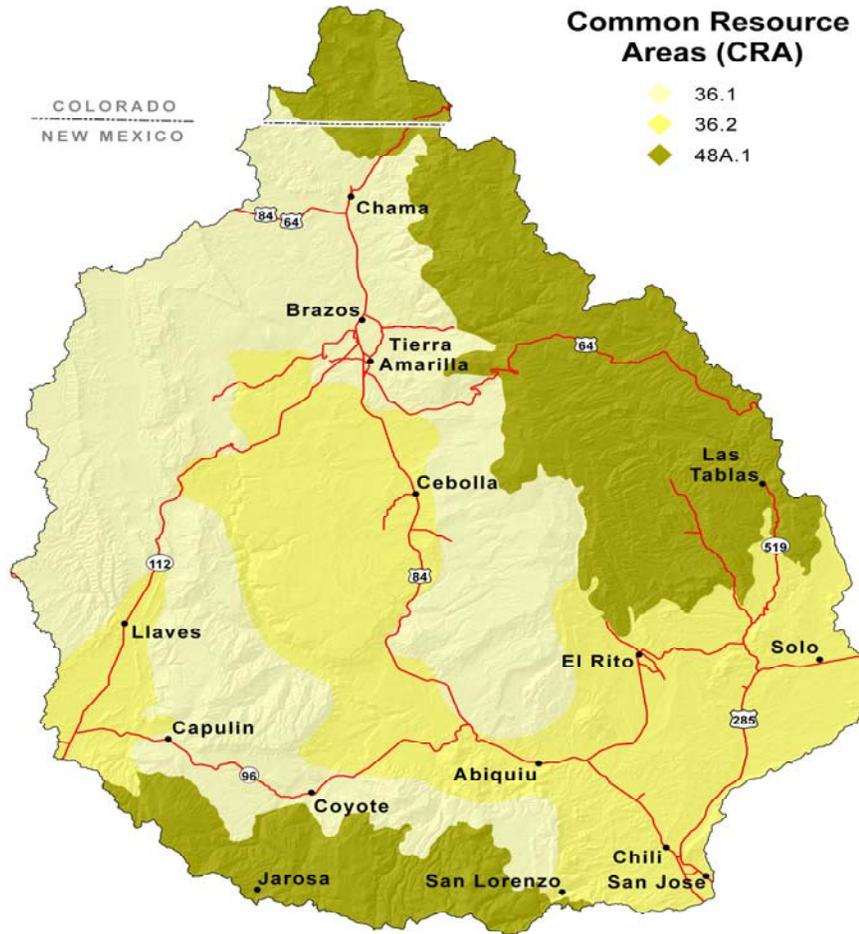


COLORADO County	County Acres	County Acres in RIO CHAMA Watershed	% of County in the Watershed	% of Watershed in the County
Archuleta	866,798	40,991	4.7%	2.0%
Conejos	825,714	11,481	1.4%	0.6%
NEW MEXICO				
Rio Arriba	3,772,858	1,925,431	51.0%	95.3%
Sandoval	2,376,961	4,143	0.2%	0.2%
Taos	1,409,910	38,344	2.7%	1.9%
		2,020,390		

Rio Chama Watershed - 13020102

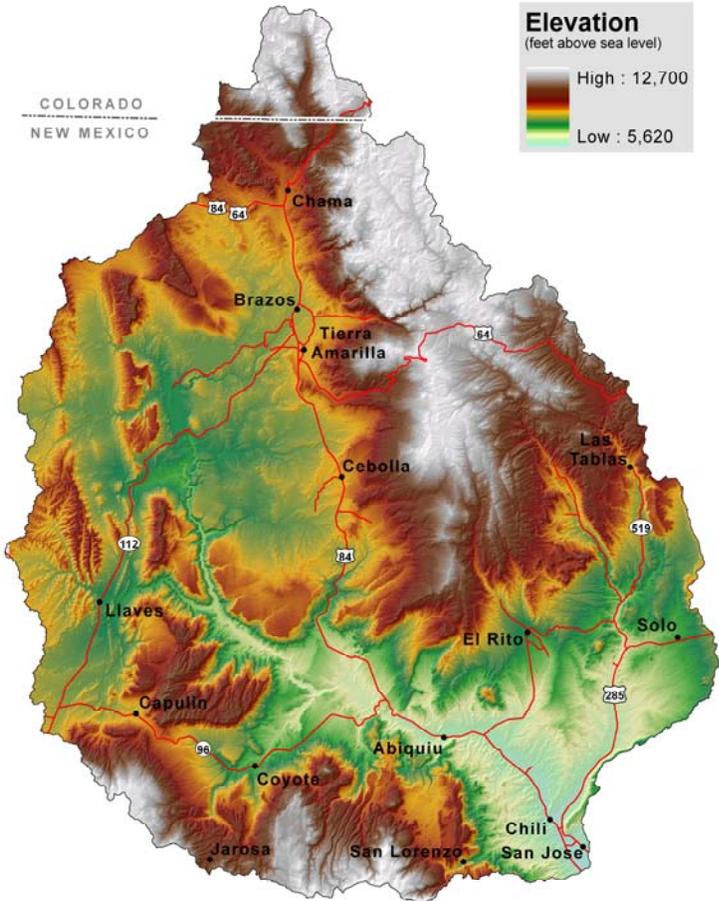
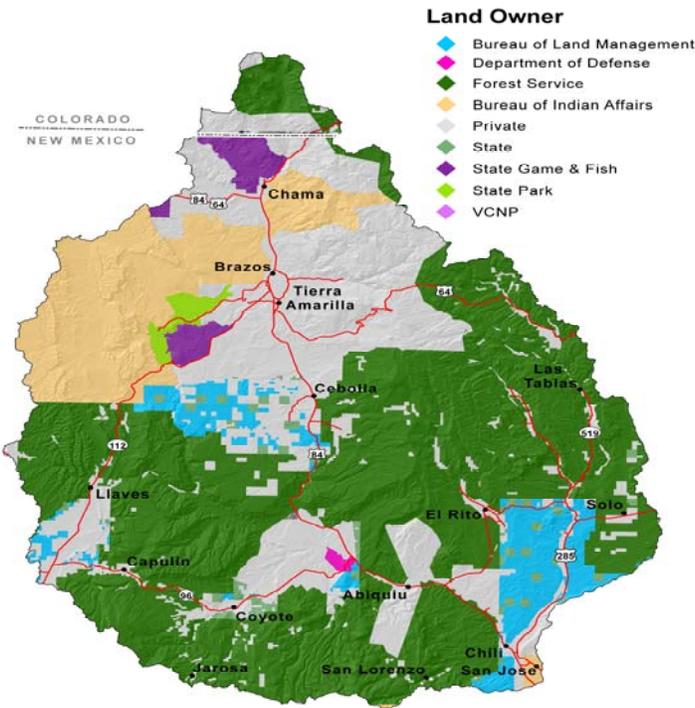


Satellite Imagery: ArcIMS Server - Geography Network Services hosted by ESRI



MLRA	CRA	CRA NAME	CRA DESCRIPTION
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.

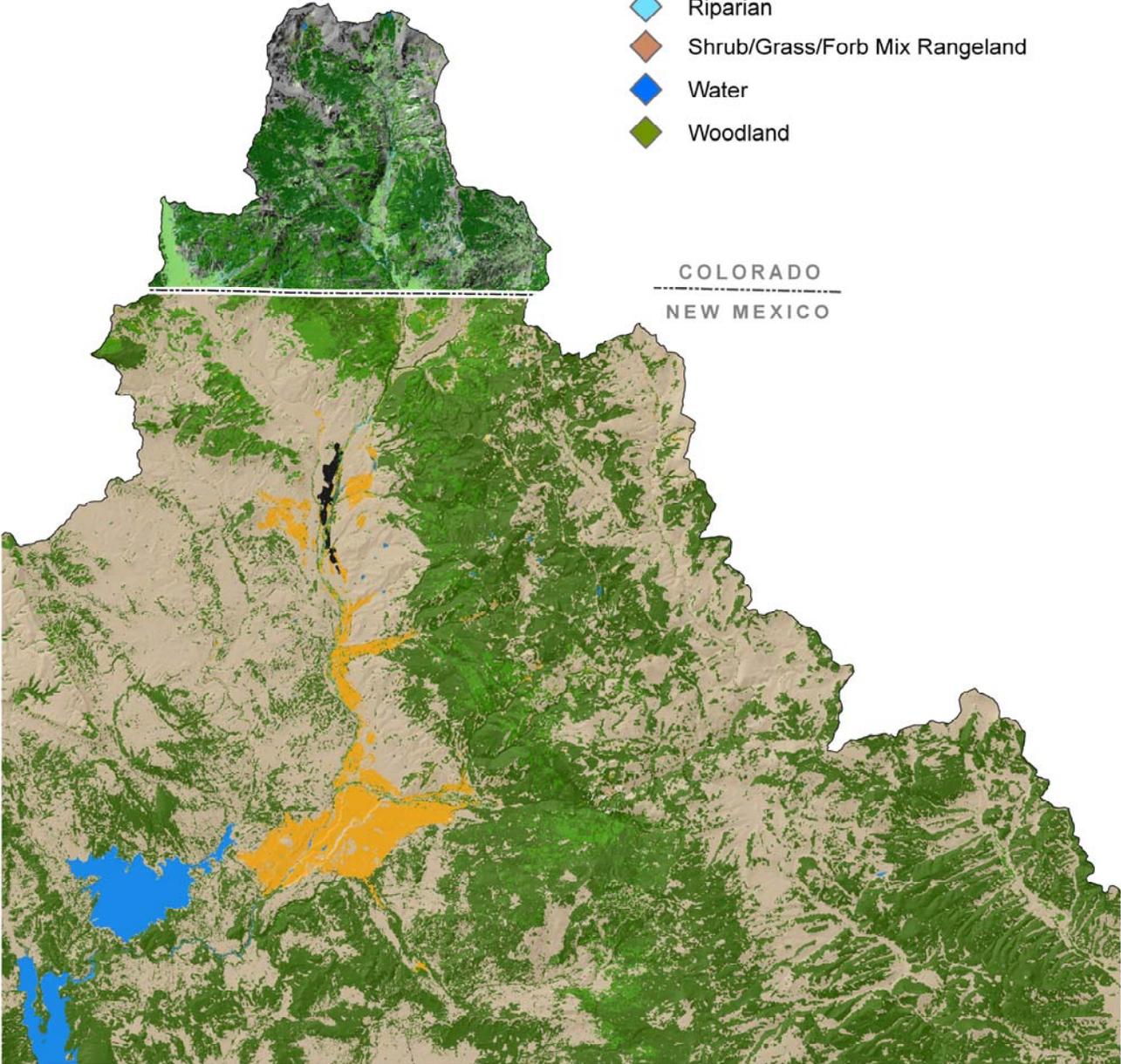
Rio Chama Watershed Land Ownership
Bureau of Land Management
National Park Service
Private
State
State, County, City; Wildlife, Parks & Rec
U.S. Forest Service



Vegetation

Colorado CVCP

- ◇ Alpine/Subalpine/Tundra
- ◆ Coniferous Forest
- ◆ Mixed Forest
- ◆ Grass Dominated
- ◆ Irrigated Ag
- ◆ Other
- ◆ Riparian
- ◆ Shrub/Grass/Forb Mix Rangeland
- ◆ Water
- ◆ Woodland

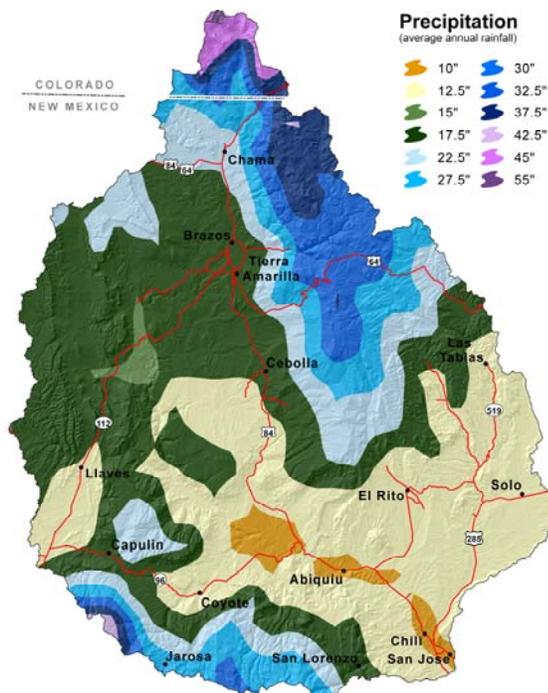


RIO CHAMA Colorado Land Use	Total Acreage	Vegetation	Acreage
Cropland	10	Irrigated Ag	10.1
Grassland	3,266	Alpine Grass Dominated	2,421.0
		Alpine Grass/Forb Mix	845.4
Rangeland	13,866	Alpine Meadow	2.5
		Grass Dominated	6,222.5
		Pinon-Juniper	35.3
		Rabbitbrush/Grass Mix	21.0
		Shrub/Grass/Forb Mix	179.7
		Sparse PJ/Shrub/Rock Mix	4.4
		SubAlpine Shrub Community	1,774.5
		Subalpine Grass/Forb Mix	5,050.3
		Upland Willow/Shrub Mix	575.4
Forest	29,366	Aspen	6,050.4
		Cottonwood	140.2
		Douglas Fir	207.1
		Douglas Fir/Aspen Mix	1,637.6
		Douglas Fir/Englemann Spruce Mix	19.4
		Englemann Spruce/Fir Mix	10,956.3
		Gambel Oak	0.2
		Ponderosa Pine	1,771.3
		Ponderosa Pine/Aspen Mix	571.6
		Ponderosa Pine/Douglas Fir Mix	1,229.6
		Spruce/Fir/Aspen Mix	6,781.8
Riparian	160	Forested Riparian	28.9
		Shrub Riparian	129.7
		Willow	1.1
Water	86	Water	85.6
Other	5,845	Rock	5,845.2
Total Colorado Watershed Acres			52,598

RIO CHAMA New Mexico Land Use	Total Acreage	Vegetation	Acreage
Cropland	23,201	Pasture/Hay	20,456.4
		Row Crops	2,477.7
		Orchards/Vineyards/Other	134.0
		Small Grains	114.3
		Fallow	18.8
Rangeland/Grassland	970,758	Shrubland	318,227.0
		Grasslands/Herbaceous	652,530.6
Forest	955,255	Deciduous Forest	24,523.4
		Evergreen Forest	919,649.7
		Mixed Forest	11,082.0
Riparian	265	Woody Wetland	4.4
		Emergent Herbaceous Wetlands	260.3
Water	16,187	Water	16,187.1
Other	3,820	Perennial Ice/Snow	1,010.6
		High Entensity Residential	6.9
		Commercial/Industrial/Transportation	857.2
		Bare Rock/Sand/Clay	1,586.3
		Quarries/Strip Mines/Gravel Pits	250.2
		Urban/Recreational Grasses	108.5
Total New Mexico Watershed Acres			1,969,485
			2,022,084

Precipitation

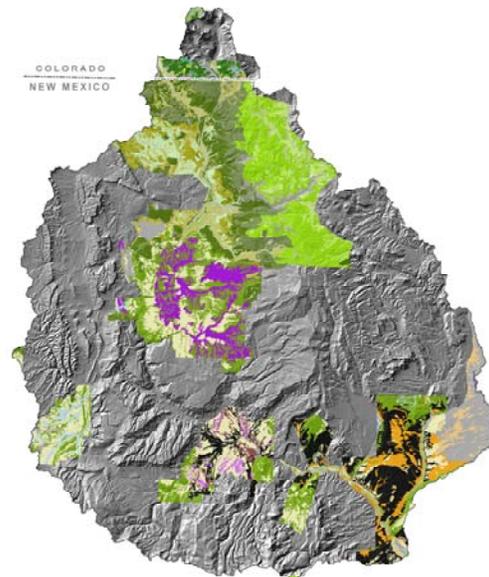
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series 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 late summer. Maximum precipitation is from mid spring through late autumn. Precipitation in winter is snow. The average annual temperature is from 45 to 55 degrees F. The frost free period averages 162 days but ranges from 133 to 191 days.



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.

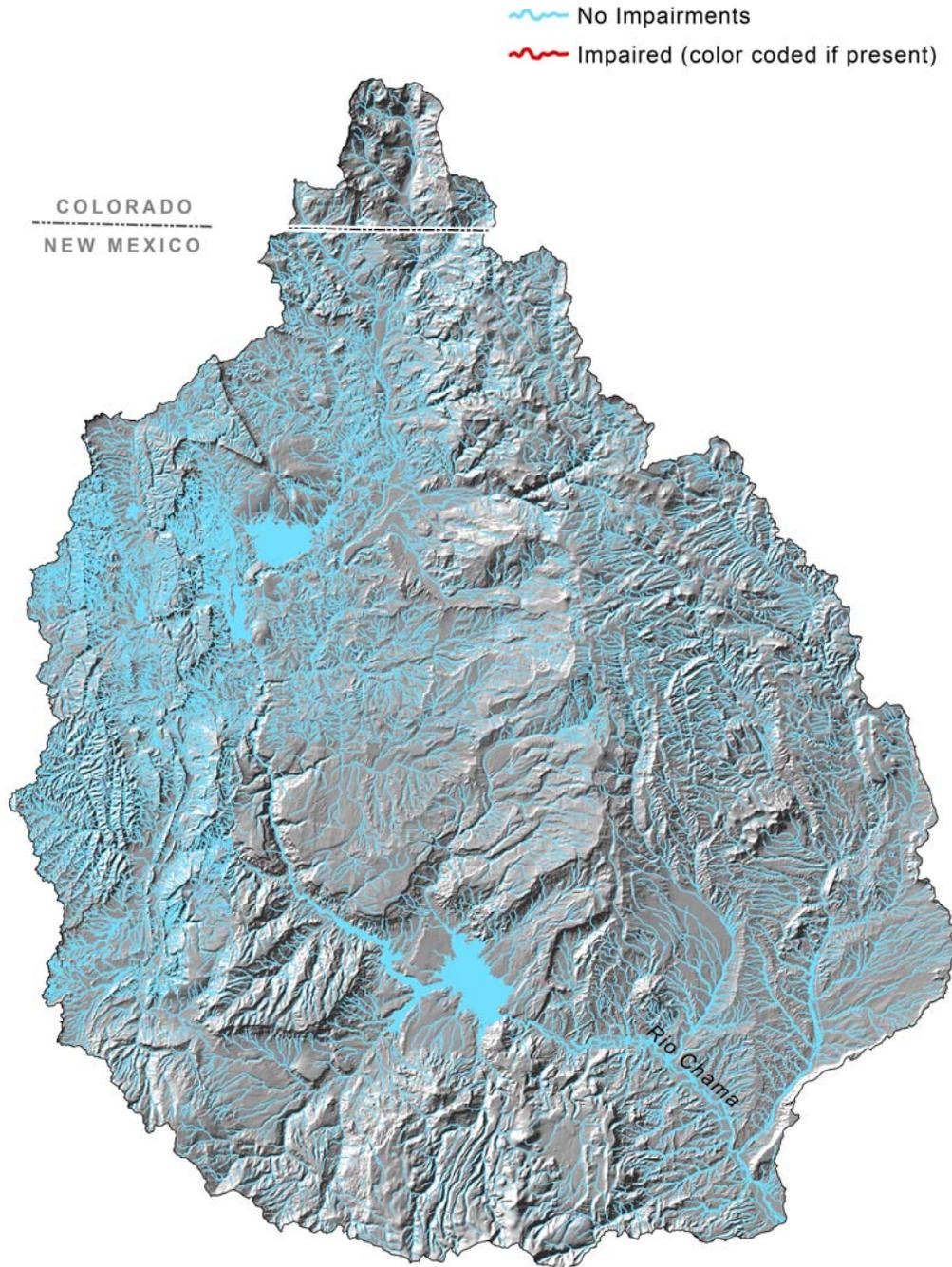
Ecological Site maps give an overall indication of the soils plant relationship in the area. More detailed descriptions of ecological sites are provided in the Field Office Technical Guide (FOTG). The FOTG is available in local offices of the Natural Resources Conservation Service (NRCS) and online at <http://www.nrcs.usda.gov/technical/efotg/>.



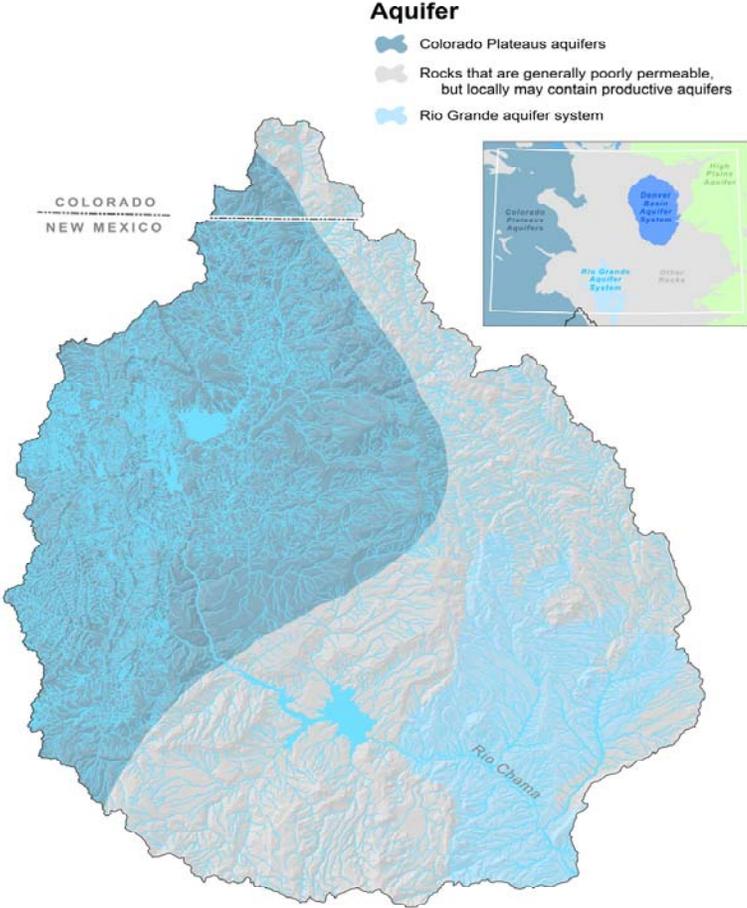
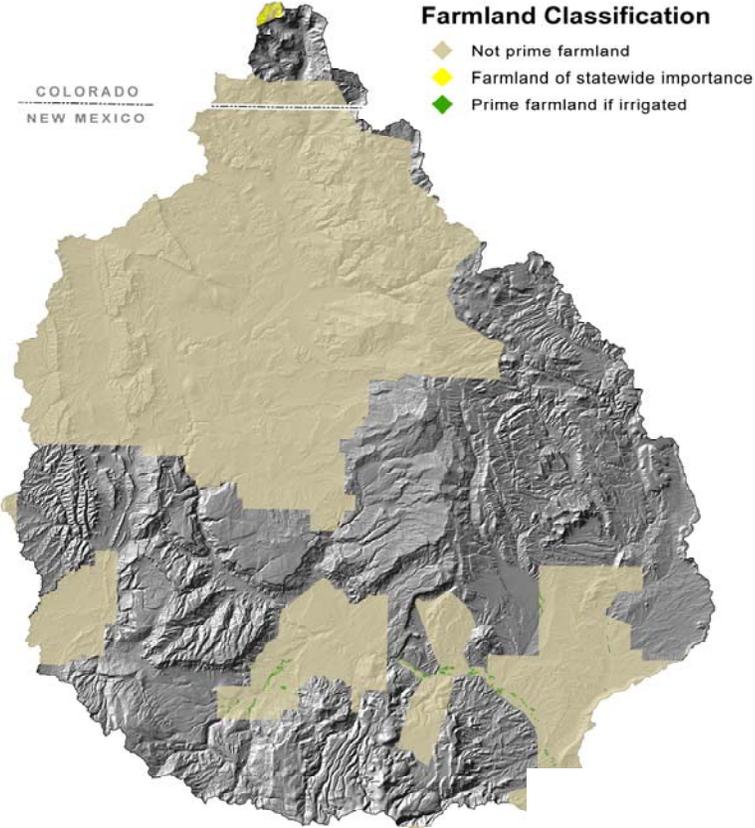
Soil: Ecological Site Names

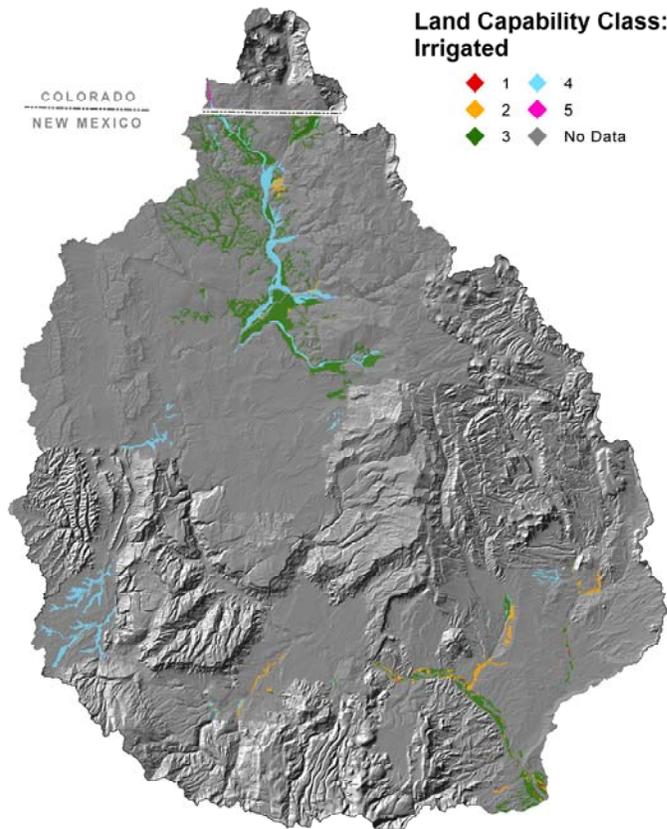
- | | |
|----------------------|-----------------------|
| ◆ No Data | ◆ Mountain Valley |
| ◆ Alpine Meadow | ◆ Pinyon Juniper |
| ◆ Alpine Slopes | ◆ Apache Pine |
| ◆ ASPEN WOODLAND | ◆ Ponderosa Pine |
| ◆ Clayey | ◆ Fremont Cottonwood |
| ◆ Clayey Bottomland | ◆ Douglas Fir |
| ◆ Deep Sand | ◆ Salt Meadow |
| ◆ Engelmann's Spruce | ◆ Salty Bottomland |
| ◆ Gravelly | ◆ Sandy |
| ◆ Gravelly Hills | ◆ Sandy Slopes |
| ◆ Loamy | ◆ Shallow Alpine |
| ◆ Malpais | ◆ Shallow Subalpine |
| ◆ Mountain Clay Loam | ◆ Stony Loam |
| ◆ Mountain Loam | ◆ Subalpine Grassland |
| ◆ Mountain Meadow | ◆ Subalpine Loam |
| ◆ Mountain Shale | ◆ White Fir |

303(d) Listed Streams & Waterbodies



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.





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.

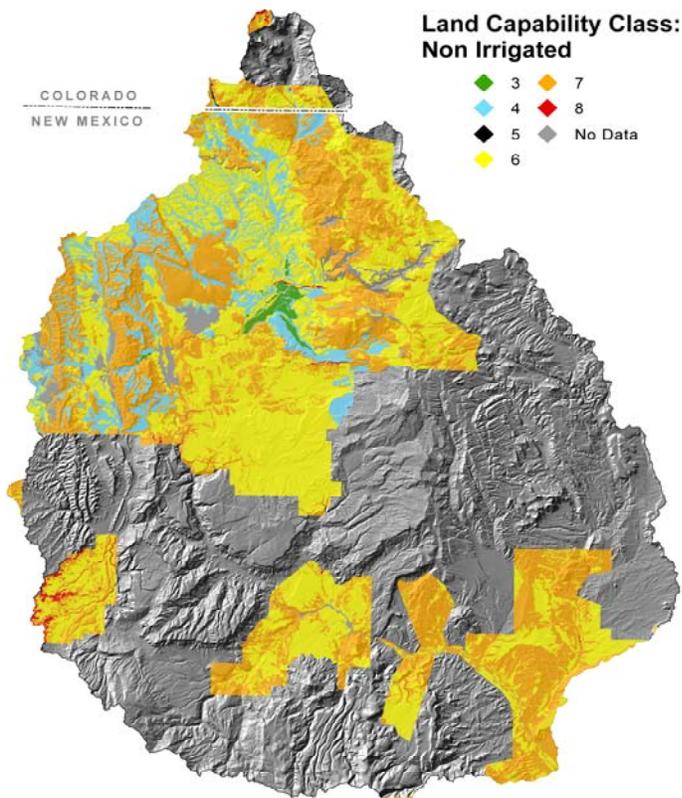
Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

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.

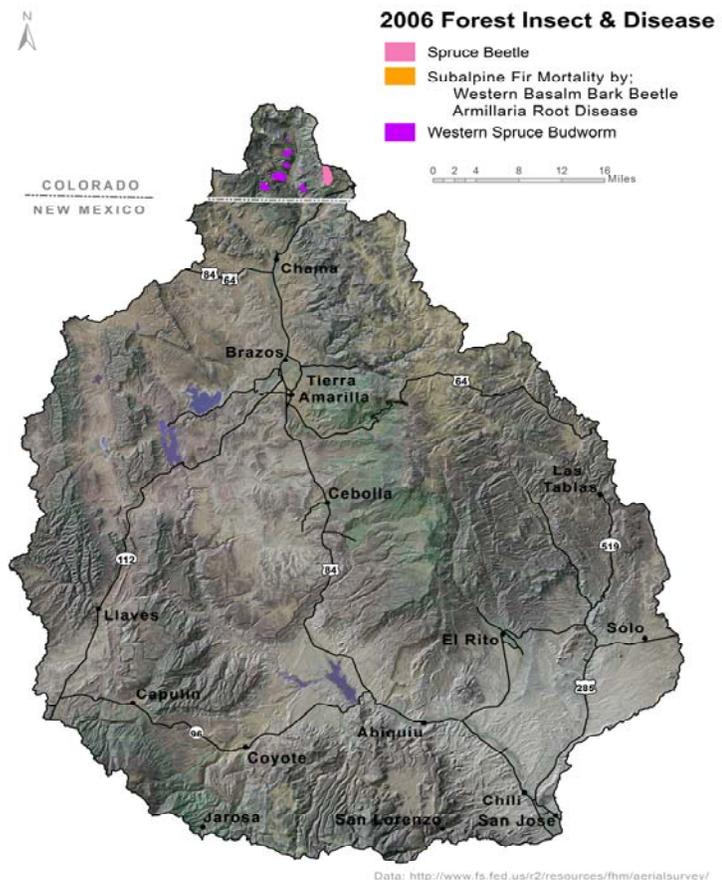
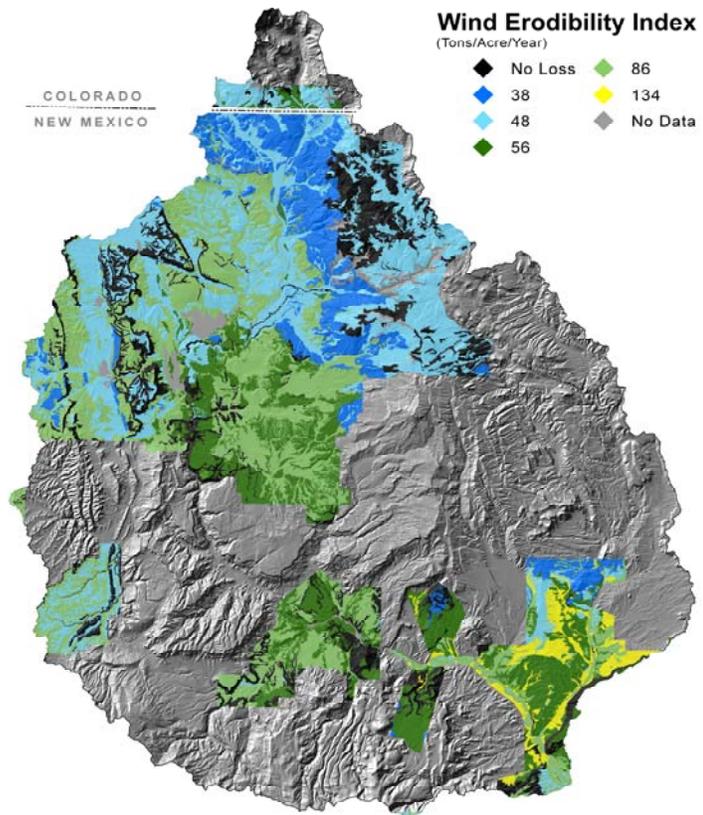
Class 8 - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.



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 Rio Chama Watershed are highly erodible.



Data: <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>

State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Rio Chama Watershed

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	May occur in the watershed
Boreal Toad	<i>Bufo boreas boreas</i>	Amphibians	Endangered/None	Occurs in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	May occur in the watershed
Greater Sandhill Crane	<i>Grus canadensis tabida</i>	Birds	Concern/None	May occur in the watershed
Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	Mammals	None/Candidate	May occur in the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	May occur 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	May occur in the watershed
Rio Grande Cutthroat Trout	<i>Oncorhynchus clarki virginialis</i>	Fish	Concern/None	Occurs in the watershed
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Birds	Endangered/Endangered	May occur 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	May occur in the watershed
Wolverine	<i>Gulo gulo</i>	Mammals	Endangered/None	Suitable habitat in watershed; No current records of occurrence

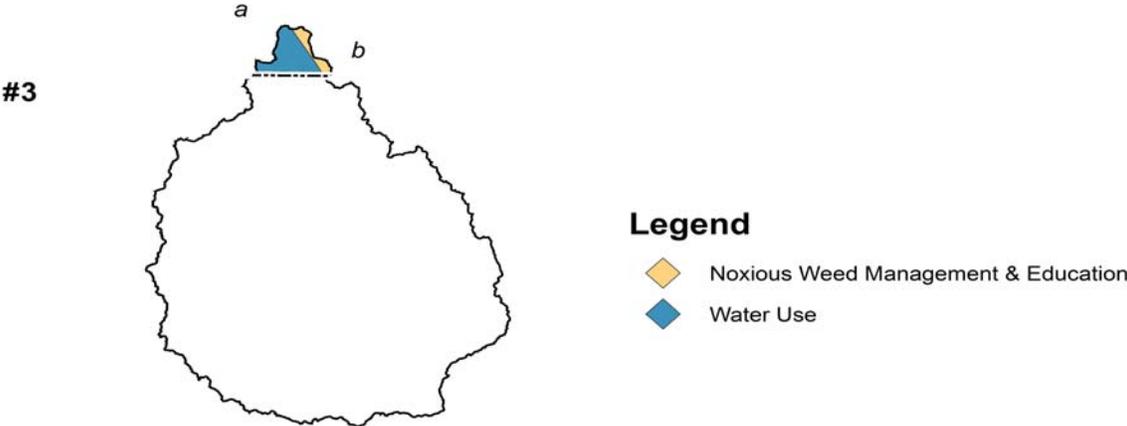
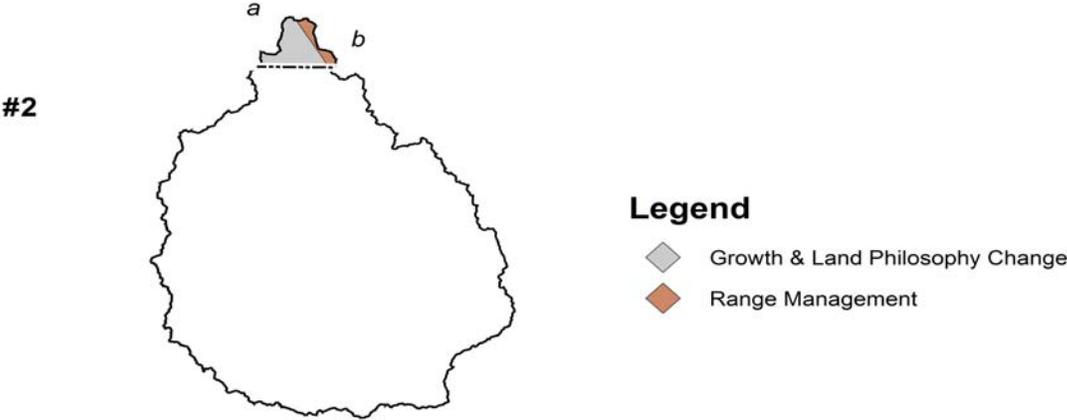
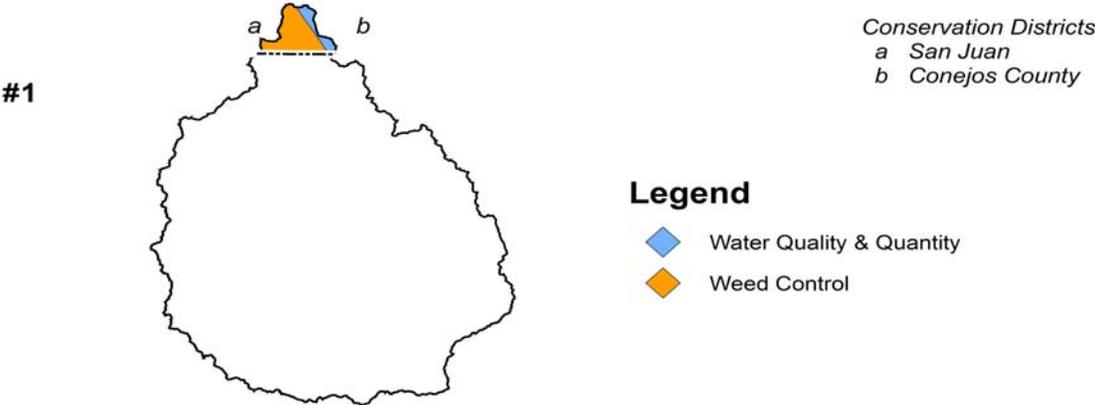
The terrestrial habitats in this watershed include foothills, montane, sub-alpine, and tundra meadows; aspen, spruce-fir, and mixed conifer forest; and alpine tundra. Rivers, streams, lakes, and wetlands provide important aquatic habitats used by many wildlife species at some life stage.

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. Wild turkey may occur at lower elevations in the watershed.

Identified Long Range Resource Concerns

Top Three Concerns within Conservation Districts



Social Data	Archuleta	Conejos
Demographics (US Census, American Factfinder)		
Total population	9,898	8,400
Male	5,016	4,169
Female	4,882	4,231
Median age (years)	40.8	34.2
White	8,743	6,112
Black or African American	35	18
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
Economic Characteristics (US Census, American Factfinder)		
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
X means that value is not applicale or not available		
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)		
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

FOOTNOTES/ BIBLIOGRAPHY

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:

Archuleta County Area (CO668) Published 05/01/2006

Rio Arriba Area, Parts of Rio Arriba and Sandoval Counties (NM650) Published 04/15/2007

Sandoval County Area, Parts of Los Alamos, Sandoval and Rio Arriba Counties (NM656) Published 04/15/2007

Taos County and Parts of Rio Arriba and Mora Counties (NM670) Published 04/15/2007

Jicarilla, Apache Nation, Parts of Rio Arriba and Sandoval Counties (NM698) Published 04/15/2007

To download SSURGO data, visit <http://soildatamart.nrcs.usda.gov>. The surveys were then loaded into Soil Data Viewer <http://soildataviewer.nrcs.usda.gov> (a tool built as an extension to ArcMAP for quick geospatial analysis of soil data for use in resource assessment) and the subsequent data was exported to a GIS shapefile.

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

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

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>.