

## Rapid Watershed Assessment Rio San Jose Watershed

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## Overview

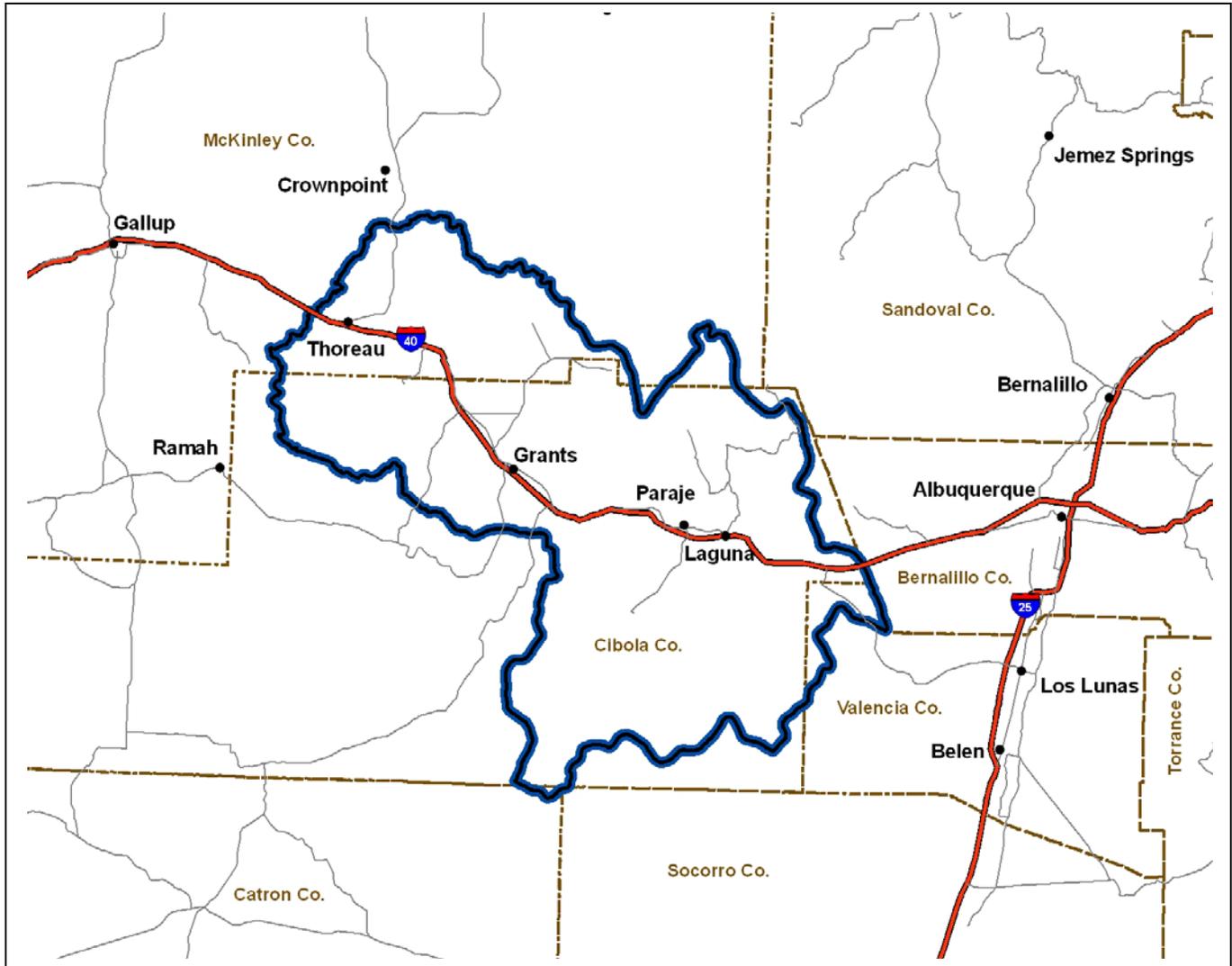
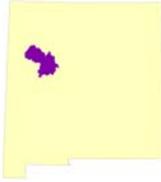


Figure 1. Rio San Jose watershed regional overview.



## Overview

Situated in the northeast portion of New Mexico, the Rio San Jose watershed, Hydrologic Unit Code (HUC) 13020207, covers approximately 1.6 million acres (6,700 sq. km). Portions of the watershed extend into 6 counties with the majority falling in Cibola county. Table 1 summarizes the aerial distribution of the Rio San Jose watershed.

County	Co. Acres Total	Acres in HUC	% Co. in HUC	% HUC in Co.
Cibola	2,909,925	1,257,138	43	76
McKinley	3,496,292	368,816	11	22
Valencia	683,583	34,103	5	2
Catron	4,442,083	2,419	<1	<1
Bernalillo	747,774	772	<1	<1
Socorro	4,255,339	280	<1	<1
Sum ( $\Sigma$ )		1,663,528		100

**Table 1. Rio San Jose watershed acreage distribution.**



## General History of the area:

This area is known for its vibrant history, characterized by volcanic eruptions, ancestral pueblos, Spanish settlers, the coming of the Iron Horse (Rail Road), uranium mining and the culture of today. The region has been inhabited for over 10,000 years by the Anasazi, or “Ancient Ones”. They habituated the area around Chaco Canyon which served as a major urban center for ancestral pueblos. This watershed is home to the Acoma, Laguna and Zuni pueblo people. Within the tribal lands of the Acoma people is the oldest continuously inhabited community in North America, Acoma Sky City. The pueblo is on a 70 acre mesa top, which dates back to the mid 1150 AD and is now the 28<sup>th</sup> National Trust Historic Sites, named by the National Trust. The Rio San Jose also has cut through the northern edge of the one of the youngest lava flow in the United States the “El Malpais” (badlands). El Malpais lava flow emanated for the Mc Carty’s crater between 2,000 and 3,000 years and is still considered a geologically active area. About 100 years before the pilgrims landed at Plymouth Rock, Spanish explorers made their way into the region looking for the undiscovered Seven Cities of Gold.

There are two towns just north of the great lava flow and a village that make up the main commerce in the area; Grants, Milan, and Blue Water village. Grants was known in the early days as Grants Camp. Once the rail road tracks were laid down it became Grants Station and simply today is the town of Grants. Grants was named for Angus A., John R. and Lewis A. Grant, brothers who established the area know as Grants Camp in the 1800’s. The community of Milan was named after the landholder and longtime mayor - Salvador Milán.

The village of Bluewater was settled in the late 1890’s and was used for some extensive agriculture fields which earned Bluewater the title, “Carrot Capital of the World.” The 1950’s brought the discovery of Uranium around Haystack mesa by a Navajo sheep herder named Paddy Martinez. This was the first discovery of uranium in the watershed that led to a uranium boom that ended in 1984, just over 30 years. Cibola County is New Mexico’s newest county, created on June 19, 1981 from the western most four fifths of the formerly much larger Valencia County.



## **Physical Setting**

### **Geology:**

The Rio San Jose occupies a portion of the Navajo Section of the Colorado Plateaus Province. The stream forms in the structural area between the Zuni Mountains and the Chaco Slope.

Geologically the San Jose begins near the Continental Divide flowing eastward through soft Triassic mudstone and siltstone. The Zuni Mountains contribute waters from the northern side of the oval-shaped dome consisting of pre-Cambrian aged granites, draped with Permian aged limestone covering the dip-slopes. The northern portions of the watershed consist of erosion resistant Jurassic and Cretaceous aged sandstones. As the river continues to the east, it carves through more Jurassic and Cretaceous aged sedimentary rocks before joining the Puerco River.

The dominant feature in the watershed is the Mount Taylor volcanic center in the north eastern portion of Cibola County. It towers over the lava capped mesas (lava flows over sandstone and shale) to the south and down to the valley and flats.

The elevation of the watershed ranges from 11,300 ft. (3,433 m) at the summit of Mt. Taylor to 5,075 ft. (1545 m) at the confluence of the Rio San Jose and the Rio Puerco in extreme western Bernalillo County. The watershed is typically characterized with moderate relief with about a third of the area sloping more than 10%.

### **Soils:**

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the Rio San Jose Watershed are assigned to four groups (A, B, C, and D).



Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.





Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.



Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.



Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.



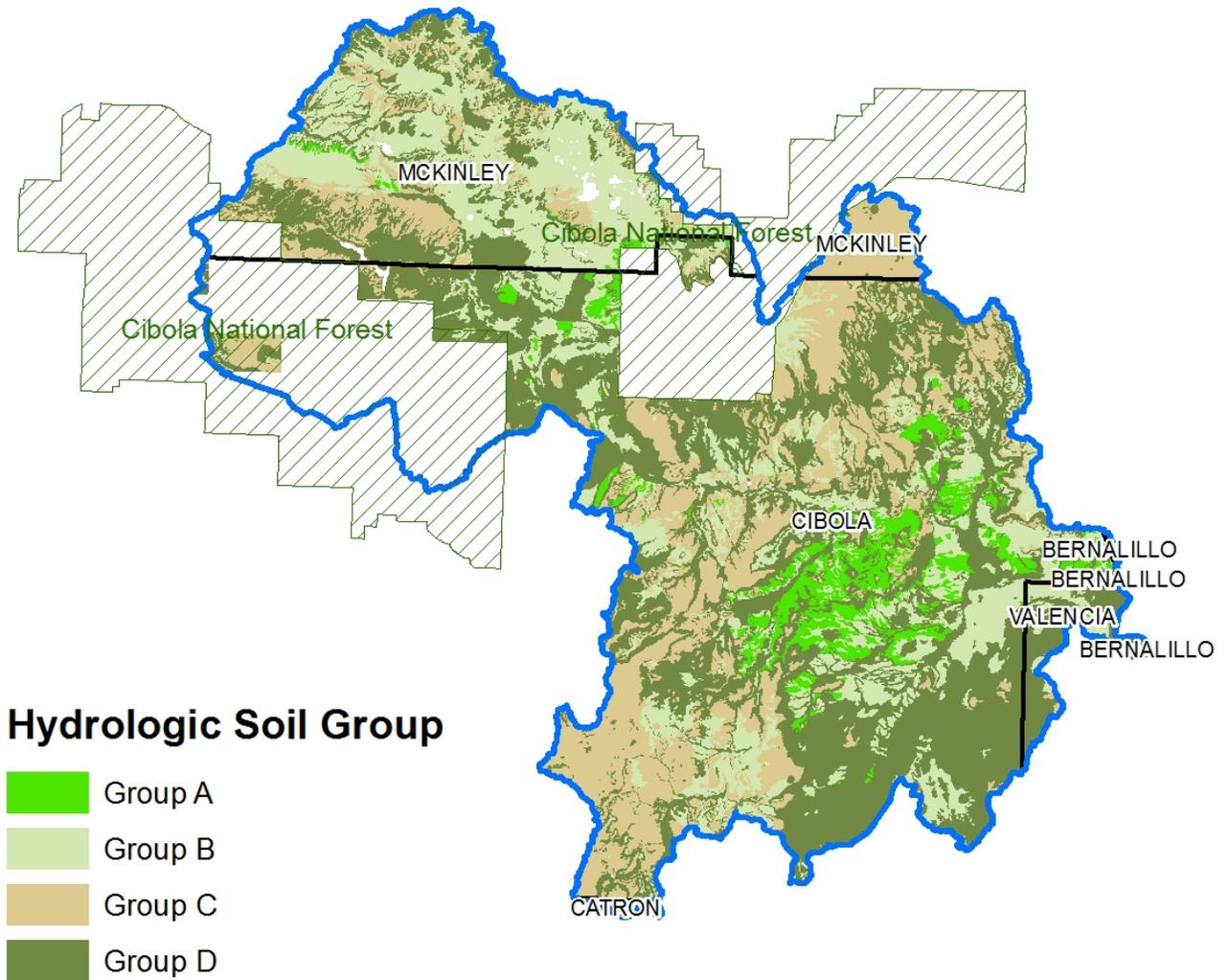


Figure 2. Hydrologic Soil Group



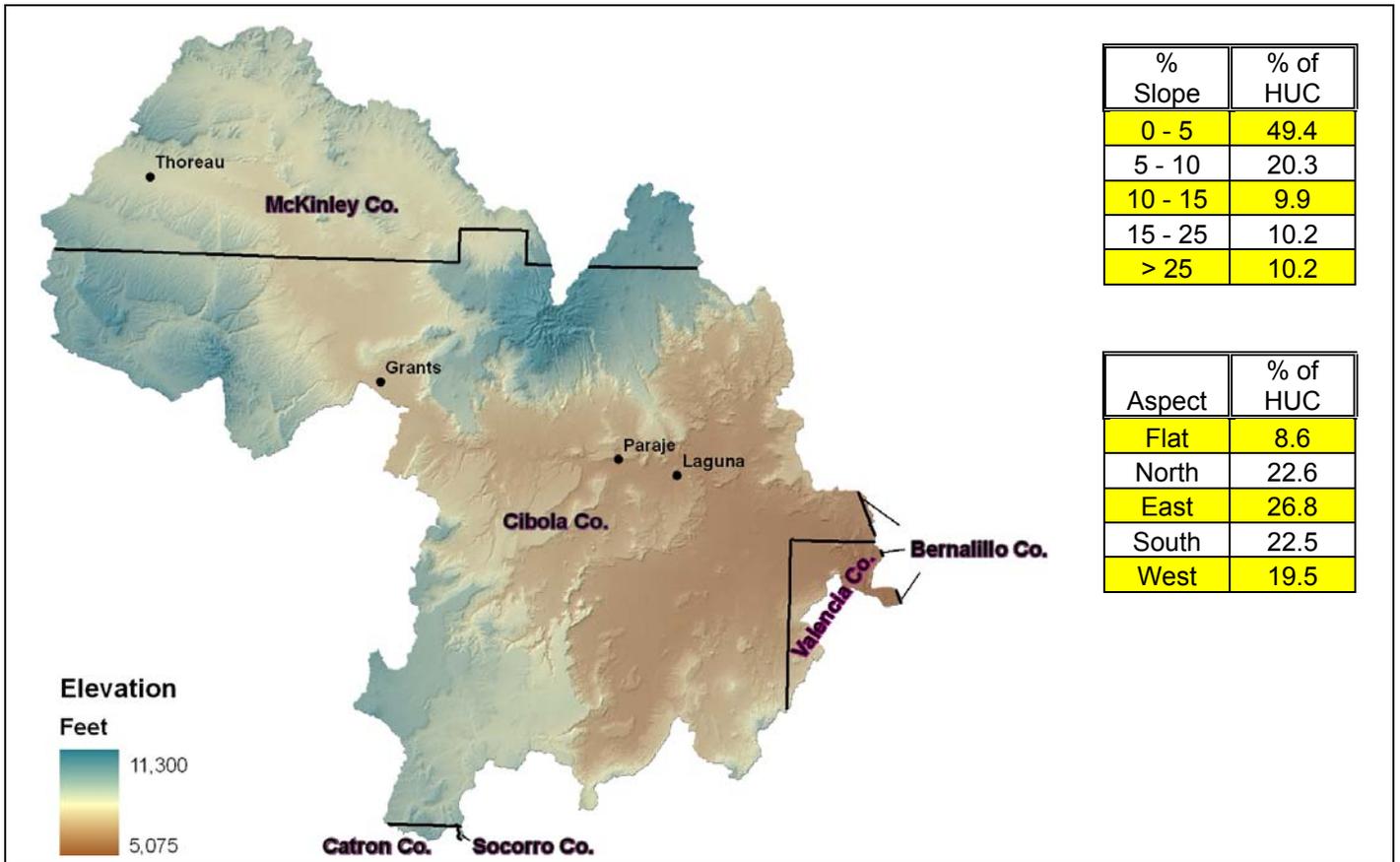


Figure 3. Rio San Jose shaded relief and geomorphic characteristics.



## Precipitation <sup>1</sup>

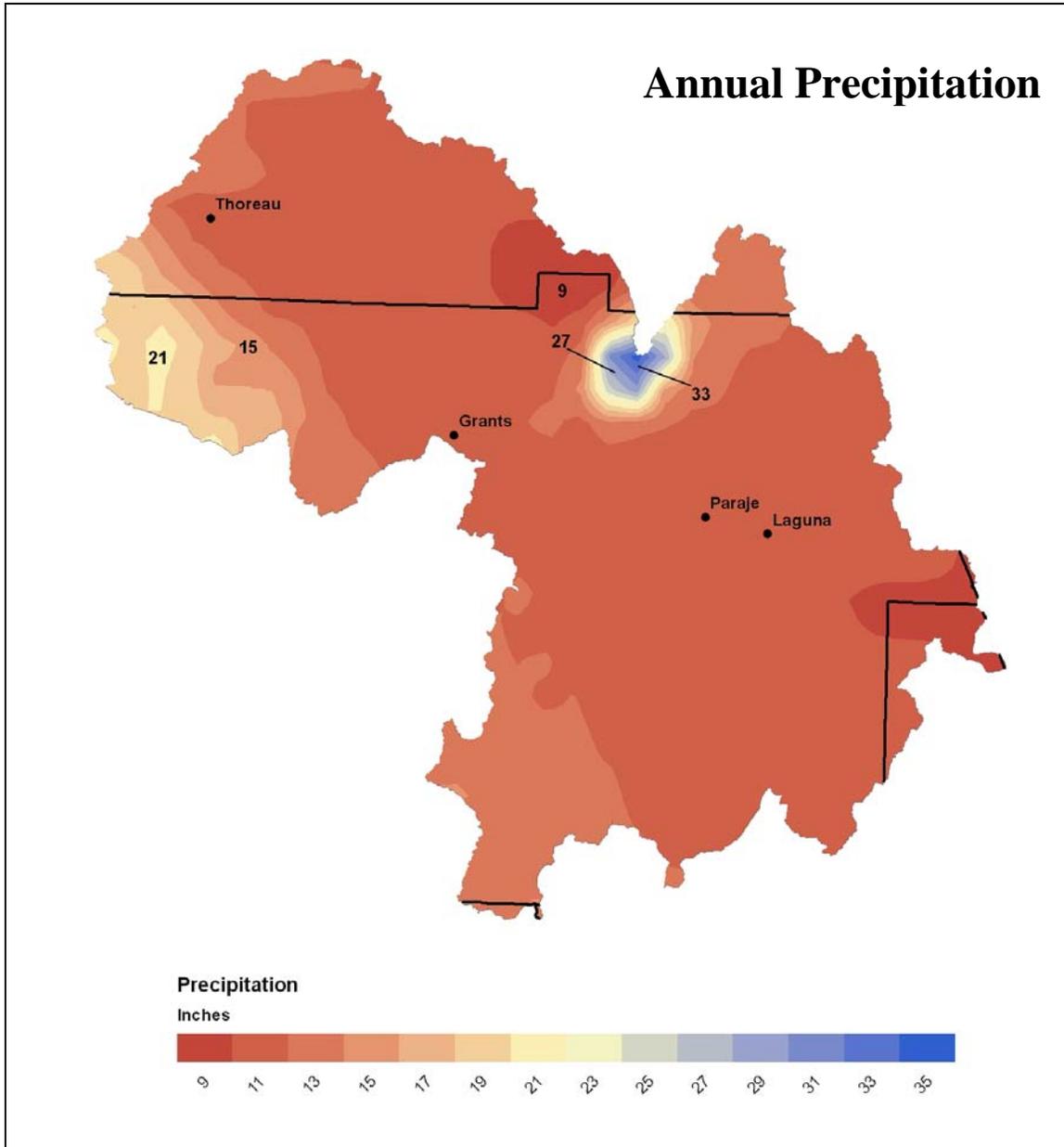
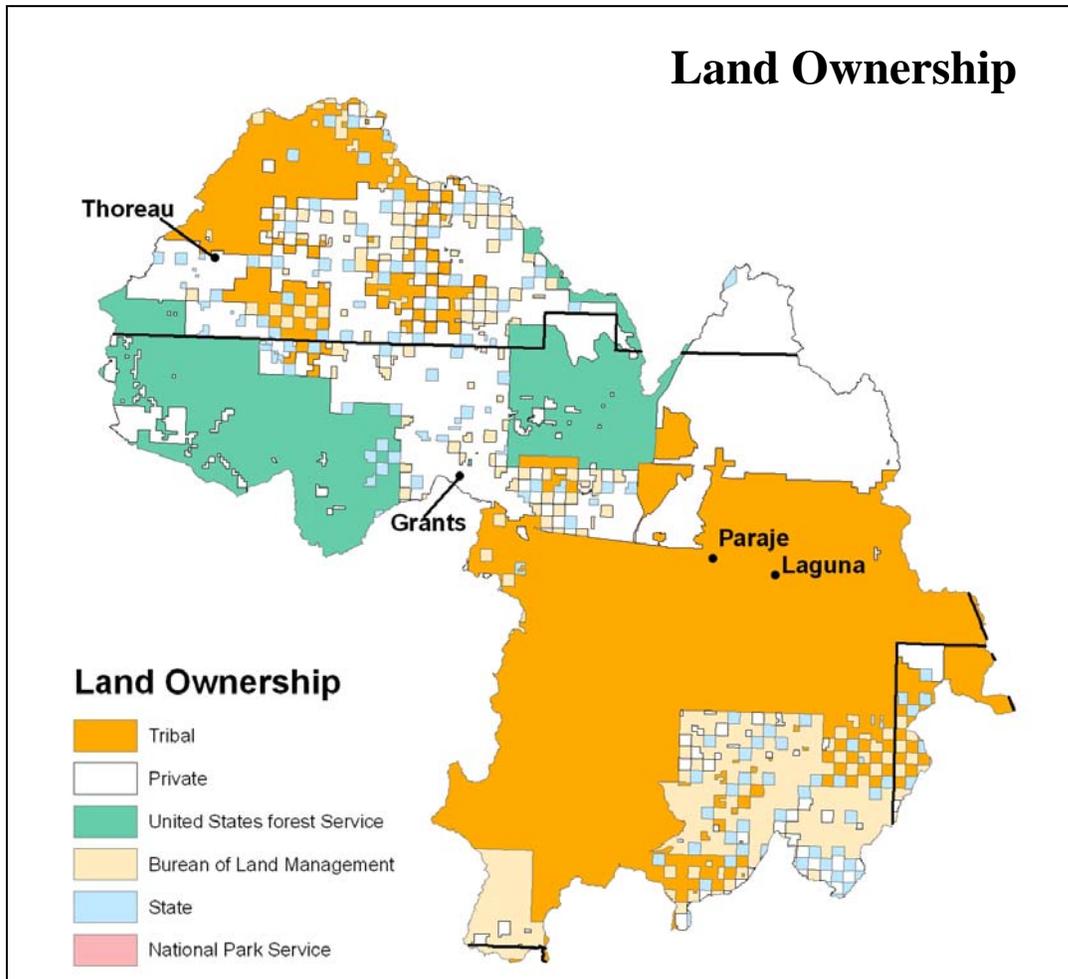


Figure 4. Annual precipitation.



## Land Ownership <sup>2</sup>

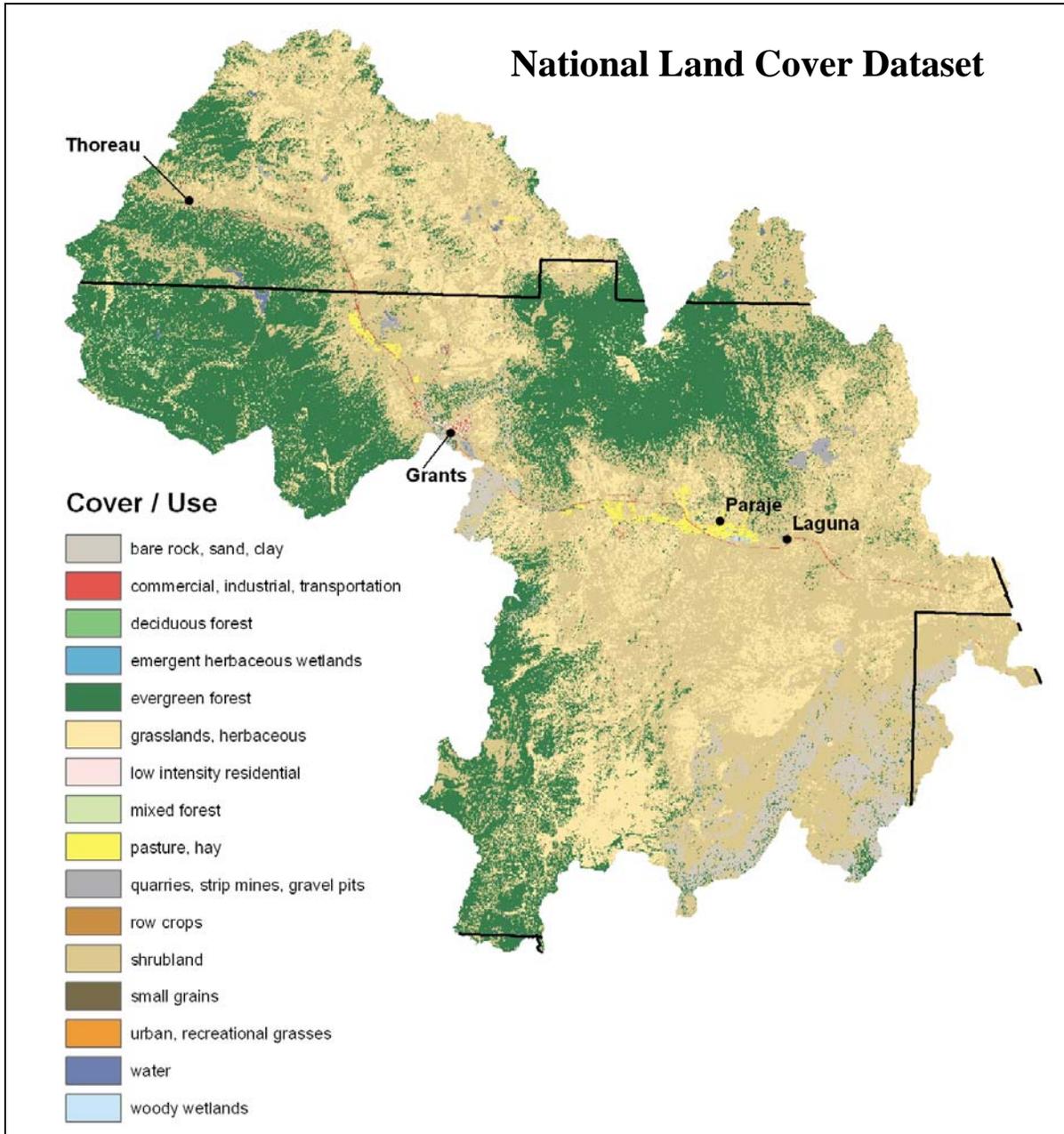


	BLM	USFS	Tribal	NPS	Private	State
Cibola	138,200	219,700	583,900	100	275,000	39,600
McKinley	32,400	25,100	111,200	<1	172,300	27,300
Socorro	100	<1	200	<1	<1	<1
Valencia	4,300	<1	20,900	<1	5,700	3,300
Catron	2,200	<1	200	<1	<1	<1
Bernalillo	<1	<1	800	<1	<1	<1
Sum( $\Sigma$ )	177,200	244,800	717,000	100	453,000	70,200
%of Watershed	11	15	43	<1	27	4

Table 2. Land ownership acreage distribution. Reported to the nearest hundred acres.



**Land Use / Land Cover** <sup>3,4</sup>



**Figure 6. Subset of the NLCD over the Rio San Jose watershed.**



## Land Use / Land Cover

The U.S. Geological Survey (USGS) produced the National Land Cover Dataset (NLCD) as part of a cooperative project between the USGS and the U.S. Environmental Protection Agency (USEPA). The goal of this project was to produce a consistent land cover data layer for the conterminous United States. The Multiresolution Land Characterization (MRLC) Consortium collected the data used to compile the NLCD. The MRLC Consortium is a partnership of Federal agencies that produce or use land cover data; partners include the UNITED STATES GEOLOGICAL SURVEY (National Mapping, Biological Resources, and Water Resources Divisions), USEPA, the U.S. Forest Service, and the National Oceanic and Atmospheric Administration.

Land Use / Land Cover	Acres	% of Watershed
shrubland	740,900	44
evergreen forest	511,700	31
grasslands, herbaceous	324,200	19
bare rock, sand, clay	61,700	4
pasture, hay	8,300	<1
quarries, strip mines, gravel pits	5,900	<1
mixed forest	5,300	<1
commercial, industrial, transportation	3,700	<1
water	2,300	<1
low intensity residential	1,300	<1
woody wetlands	300	<1
urban, recreational grasses	200	<1
emergent herbaceous wetlands	100	<1
deciduous forest	< 100	<1
row crops	< 100	<1
small grains	< 100	<1

**Table 3. Extent of NLCD classes. Reported to the nearest hundred acres.**



**Land Use / Land Cover**

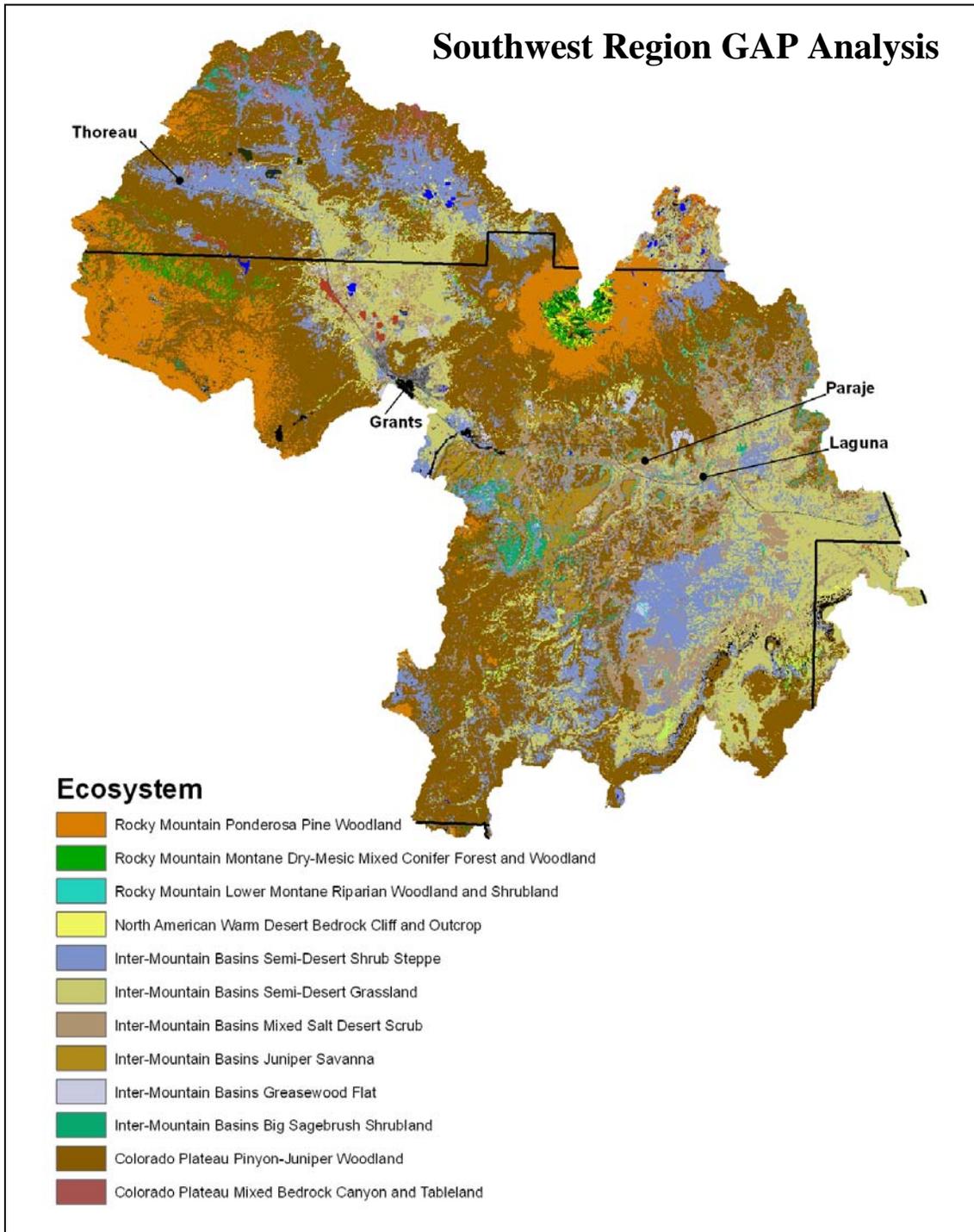


Figure 7. Subset of the SW ReGAP. The 12 dominant ecosystems are shown in the legend.



## Land Use / Land Cover

The land cover mapping effort for the Southwest Region Gap Analysis Project (SW ReGAP) was a coordinated multi-institution endeavor. This dataset was created for regional terrestrial biodiversity assessment. Additional objectives were to establish a coordinated mapping approach to create detailed, seamless maps of land cover, all native terrestrial vertebrate species, land stewardship, and management status, and to analyze this information to identify those biotic elements that are underrepresented on lands managed for their long term conservation.

<b>Ecosystem</b>	<b>Acres</b>	<b>% of Watershed</b>
Colorado Plateau Pinyon-Juniper Woodland	653,100	39
Inter-Mountain Basins Semi-Desert Grassland	292,100	18
Inter-Mountain Basins Semi-Desert Shrub Steppe	249,200	15
Rocky Mountain Ponderosa Pine Woodland	155,800	9
Inter-Mountain Basins Mixed Salt Desert Scrub	118,000	7
Inter-Mountain Basins Juniper Savanna	57,300	3
Colorado Plateau Mixed Bedrock Canyon and Tableland	22,900	1
Inter-Mountain Basins Big Sagebrush Shrubland	17,600	1
Inter-Mountain Basins Greasewood Flat	13,300	<1
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	12,800	<1
North American Warm Desert Bedrock Cliff and Outcrop	8,600	<1
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	8,200	<1
Inter-Mountain Basins Volcanic Rock and Cinder Land	7,300	<1
Rocky Mountain Cliff and Canyon	5,600	<1
Developed, Medium - High Intensity	5,400	<1
Developed, Open Space - Low Intensity	4,600	<1
Rocky Mountain Aspen Forest and Woodland	4,000	<1
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	3,100	<1
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	3,100	<1
Madrean Juniper Savanna	2,900	<1
Open Water	2,800	<1
Agriculture	2,800	<1
Southern Rocky Mountain Montane-Subalpine Grassland	2,200	<1
Rocky Mountain Subalpine-Montane Riparian Shrubland	2,100	<1
Mogollon Chaparral	1,400	<1
North American Arid West Emergent Marsh	1,400	<1
Chihuahuan Sandy Plains Semi-Desert Grassland	1,300	<1

**Table 4. Extent of the SWReAP ecosystems. Reported to the nearest hundred acres.**



**Land Use / Land Cover**

<b>Ecosystem</b>	<b>Acres</b>	<b>% of Watershed</b>
Recently Mined or Quarried	1,200	<1
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	900	<1
Inter-Mountain Basins Shale Badland	900	<1
Madrean Pinyon-Juniper Woodland	800	<1
Colorado Plateau Mixed Low Sagebrush Shrubland	700	<1
Rocky Mountain Alpine-Montane Wet Meadow	600	<1
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	500	<1
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	500	<1
Southern Rocky Mountain Pinyon-Juniper Woodland	300	<1
Madrean Pine-Oak Forest and Woodland	100	<1
North American Warm Desert Wash	100	<1
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	100	<1

**Table 4 cont'd. Extent of the SW ReGAP ecosystems.**



**Hydrology** <sup>5,6,7,8</sup>

Under section 303(d) of the Clean Water Act, states, territories, and authorized tribes, are required to develop lists of impaired waters. These are waters for which technology-based regulations and other required controls are not stringent enough to meet the water quality standards set by states. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs), for these waters. A TMDL is a calculation of the maximum amount of a pollutant a water body can receive and still safely meet water quality standards.

The New Mexico Water Quality Control Commission (NMWQCC) is the issuing agency of water quality standards for interstate and intrastate waters. In this role, it is the responsibility of the NMWQCC to assess the waters in New Mexico for compliance with the Clean Water Act. The NMWQCC has subdivided the Rio San Jose watershed into 7 reaches totaling 65.6 miles (105.5 km) and 608 acres (2.5 sq km.) These reaches are listed in Table 5.

Reach	Coldwater Aquatic Life	Aquatic Wildlife	Domestic Water Supply	Fish Culture	Irrigation	Livestock Watering	Primary Contact	Secondary Contact	Wildlife Habitat
Bluewater Creek (Bluewater Rsvr to headwaters)	X		X	X	X	X	X		X
Rio Moquino (Laguna Pueblo to Seboyettia Creek)	X		X	X	X	X	X	X	X
Bluewater Creek (non-tribal Rio San Jose to Bluewater Rsvr)	X		X	X	X	X	X		X
Bluewater Lake	X		X	X	X	X	X		X
Rio Paguete (Laguna Pueblo bnd to headwaters)	X		X	X	X	X	X		X
Rio San Jose (Horrace Springs to Grants WWTP)		X				X		X	X
Seboyeta Creek (Rio Moquino to headwaters)	X		X	X	X	X	X		X

x = Designated Use	Fully Supporting	Not Supporting
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**Table 5. NMWQCC designated uses and 303(b) assessments.**



## Hydrology

Within the 2008 – 2010 listing cycle of the New Mexico Integrated Clean Water Act report, 3 of the 6 listed reaches had an impairment which prevented support/attainment of at least one designated use. Potential causes of the impairments have been identified as eutrophication, sedimentation, temperature, and turbidity. Sources leading to impairment are forest road construction, loss of riparian habitat, poor grazing management, timber harvesting, stream bank destabilization, or mining.

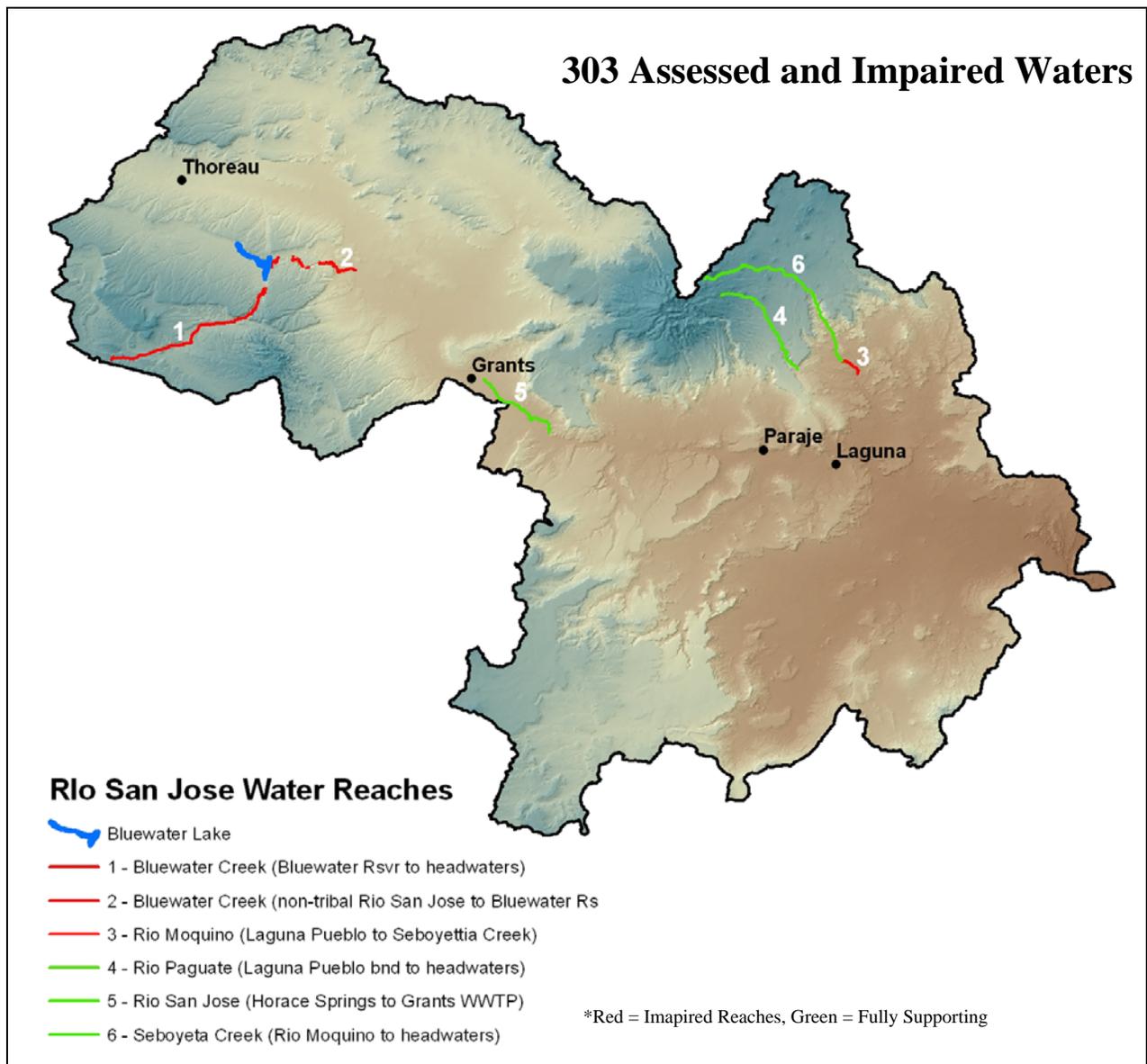


Figure 8. NMWQCC water courses.



## Hydrology

There are three declared groundwater basins within the Rio Felix watershed. These basins cover 100% of the area within the watershed. A declared groundwater basin is an area of the state proclaimed by the State Engineer to be underlain by a groundwater source having reasonably ascertainable boundaries. By such proclamation the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source. Figure 8 summarizes groundwater basins in the Rio San Jose watershed.

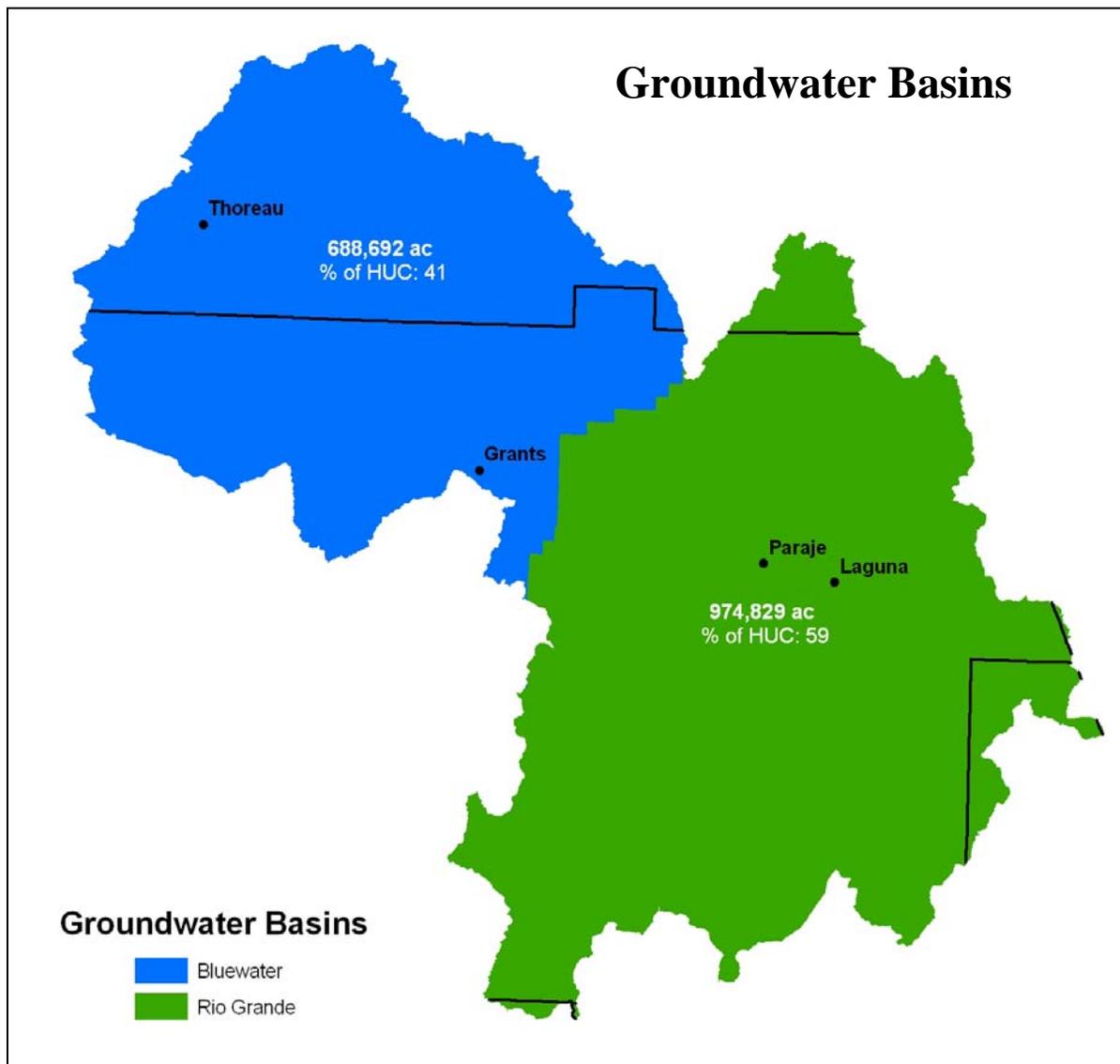


Figure 9. Declared groundwater basins.



## Threatened and Endangered Species <sup>9</sup>

Endangered species are those that are at risk of extinction throughout all or a significant portion of its native range. A threatened species is one that is likely to become endangered in the foreseeable future. The New Mexico Natural Heritage Program (N MNH), a division of the Museum of Southwestern Biology, collects data on the biology, status and location of the New Mexico's biological resources. In addition, NMNH keeps track of any legal or informal status applied to biological resources with respect to rarity or conservation priority by both governmental and non-governmental agencies. As such, NMNH maintains a tracking list of about 600 Threatened, Endangered, and Sensitive (TES) animal and plant species of particular concern or sensitivity in New Mexico. Table 6 lists those species which are currently listed and tracked in the watershed.

Common Name	Scientific Name	Fed Status	State Status	Global Rank	State Rank
Rio Grande Sucker	Catostomus plebeius			G3G4	S2
White Sucker	Catostomus commersoni			G5	S5
Rio Grande Chub	Gila pandora			G3	S3
Northern Leopard Frog	Rana pipiens			G5	S1
Northern Goshawk	Accipiter gentilis			G5	S2B,S3N
Savannah Sparrow	Passerculus sandwichensis			G5	S2B,S5N
American Peregrine Falcon	Falco peregrinus anatum		T	G4T3	S2B,S3N
Wilson's Phalarope	Phalaropus tricolor			G5	S2B,S4N
Mexican Spotted Owl	Strix occidentalis lucida	LT		G3T3	S2B,S2N
Southwestern Willow Flycatcher	Empidonax traillii extimus	LE	E	G5T1T2	S1B,S1N
Acoma Fleabane	Erigeron acomanus			G1G2	S1S2
Alpine Fever-few	Parthenium alpinum			G3	S2
Pecos Sunflower	Helianthus paradoxus	LT	E	G2	S2
	Lesquerella navajoensis			G1?	S1
Grana Grass Cactus	Sclerocactus papyracanthus			G4	S4
Wright Prickly-pear	Mammillaria wrightii			G4	S3
Chaco Milk-vetch	Astragalus micromerius			G2G3	S2S3
Zuni Milk-vetch	Astragalus accumbens			G3	S3
New Mexico Scorpion-weed	Phacelia neomexicana			G5	S3?
Arizona Coral-drops	Besseyia arizonica			G4	S4
Mt. Graham Beardtongue	Penstemon deaveri			G3?	S3?
Big Free-tailed Bat	Nyctinomops macrotis			G5	S3
Merriam's Shrew	Sorex merriami			G5	S2
Spotted Bat	Euderma maculatum		T	G4	S3
A Sedge	Carex geophila			G5	S4?
Mountain Adder's-mouth	Malaxis macrostachya			G4?	SNR
Parish's Alkali Grass	Puccinellia parishii		E	G2	S1

Table 6. NMNH tracked plant and animal species. For field descriptions see [Appendix A](#).



## **Invasive Species** <sup>10</sup>

Invasive species are those which have been introduced into a region or ecosystem and have the ability to out-compete native species for resources (i.e. water, nutrients, sunlight, etc.) The Southwest Exotic Plant Mapping Program (SWEMP) is a collaborative effort between the United States Geological Survey and federal, tribal, state, county and non-government organization partners in the southwest which maintains ongoing efforts to compile and distribute regional data on the occurrence of non-native invasive plants in the southwestern United States. These species are defined as non-native by the USDA PLANTS database.

<b>Scientific Name</b>	<b>Common Name</b>
Cirsium vulgare	bull thistle
Alhagi maurorum	camelthorn
Acroptilon repens	hardheads
Carduus nutans	nodding plumeless thistle
Onopordum acanthium	Scotch cottonthistle
Carduus acanthoides	spiny plumeless thistle
Centaurea stoebe ssp. micranthos	spotted knapweed
Tamarix species	tamarisk

**Table 7. SWEMP invasive plant species in the Rio San Jose watershed.**



## Common Resource Areas

A Common Resource Area (CRA) is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) designation. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area.

Each Common Resource Area will have multiple Conservation System Guides associated with it. A Conservation System Guide associates, for a given CRA and land use, different components of Resource Management Systems and their individual effect on conserving soil and water resources.

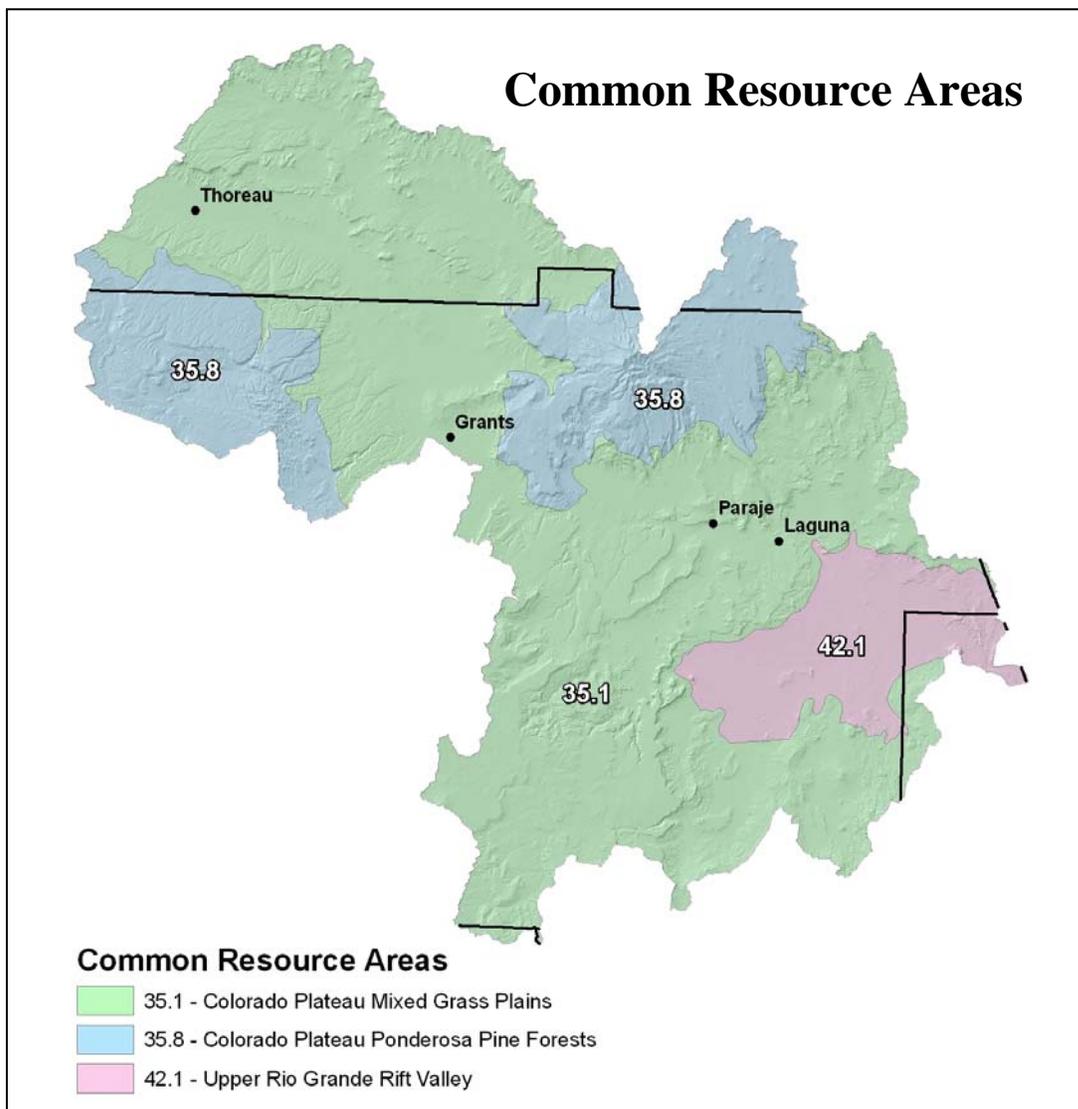


Figure 10. Common Resource Areas.



## **Common Resource Areas**

### **35.1 - Colorado Plateau Mixed Grass Plains**

This unit occurs within the Colorado Plateau Physiographic Province and is characterized by flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Volcanic fields occur in places. Elevations range from 5100 to 6000 feet. Precipitation averages 10 to 14 inches per year. The soil temperature regime is mesic. The soil moisture regime is ustic aridic. Vegetation includes Stipa, Indian ricegrass, galleta, blue grama, fourwing saltbush, and scattered juniper.

### **35.8 - Colorado Plateau Ponderosa Pine Forests**

This unit occurs within the Colorado Plateau Physiographic Province and is characterized by gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Volcanic fields occur in places. Elevations range from 6800 to 8500 feet. Precipitation averages 17 to 25 inches per year. The soil temperature regime ranges from mesic to frigid. The soil moisture regime is typic ustic. Vegetation includes ponderosa pine, white fir, aspen, pinyon, juniper, Gambel oak, and big sagebrush.

### **42.1 - Upper Rio Grande Rift Valley**

This unit occurs within the Basin and Range Physiographic Province and contains the upper Rio Grande Rift Valley. Elevations range from 4500 to 5500 feet. Precipitation ranges from 8 to 11 inches per year. The soil temperature regime ranges thermic to mesic. The soil moisture regime is typic aridic. Indian ricegrass, New Mexico feathergrass, galleta, blue grama and bottlebrush squirreltail characterize vegetation in the cooler portions. Warmer portions include black grama and tobosa. Alkali sacaton, dropseed and threeawns are common.



## Conservation

The USDA-Natural Resources Conservation Service (NRCS) focuses on the development and delivery of high quality products and services that enable agricultural producers to be good stewards of our Nation's soil, water, and related natural resources on non-Federal lands. The Natural Resources Conservation Service's conservation programs aid producers in their efforts to reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters. Public benefits include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation, and scenic beauty.

In fiscal year 2008, 119 planned conservation practices addressed resource concerns on more than 200,000 acres in the Rio San Jose watershed. These programs were administered from the Grants, Gallup, and Crownpoint USDA-NRCS Service Centers. Tables 8 and 9 summarize these practices.

Conservation Practice	Cibola	McKinley	Sum ( $\Sigma$ )
Forage Harvest Management	34	---	34
Irrigation Land Leveling	12	---	12
Irrigation Water Management	21	---	21
Pasture and Hay Planting	5	---	5
Pest Management	18	---	18
Prescribed Grazing	120,770	460	121,230
Upland Wildlife Habitat Management	97,636	460	98,096
Brush Management	---	63	63

**Table 8. 2008 planned conservation practices. Reported in acres.**



## Conservation

Table 9 lists planned conservation practices that are location specific (one dimensional) within the Rio San Jose watershed.

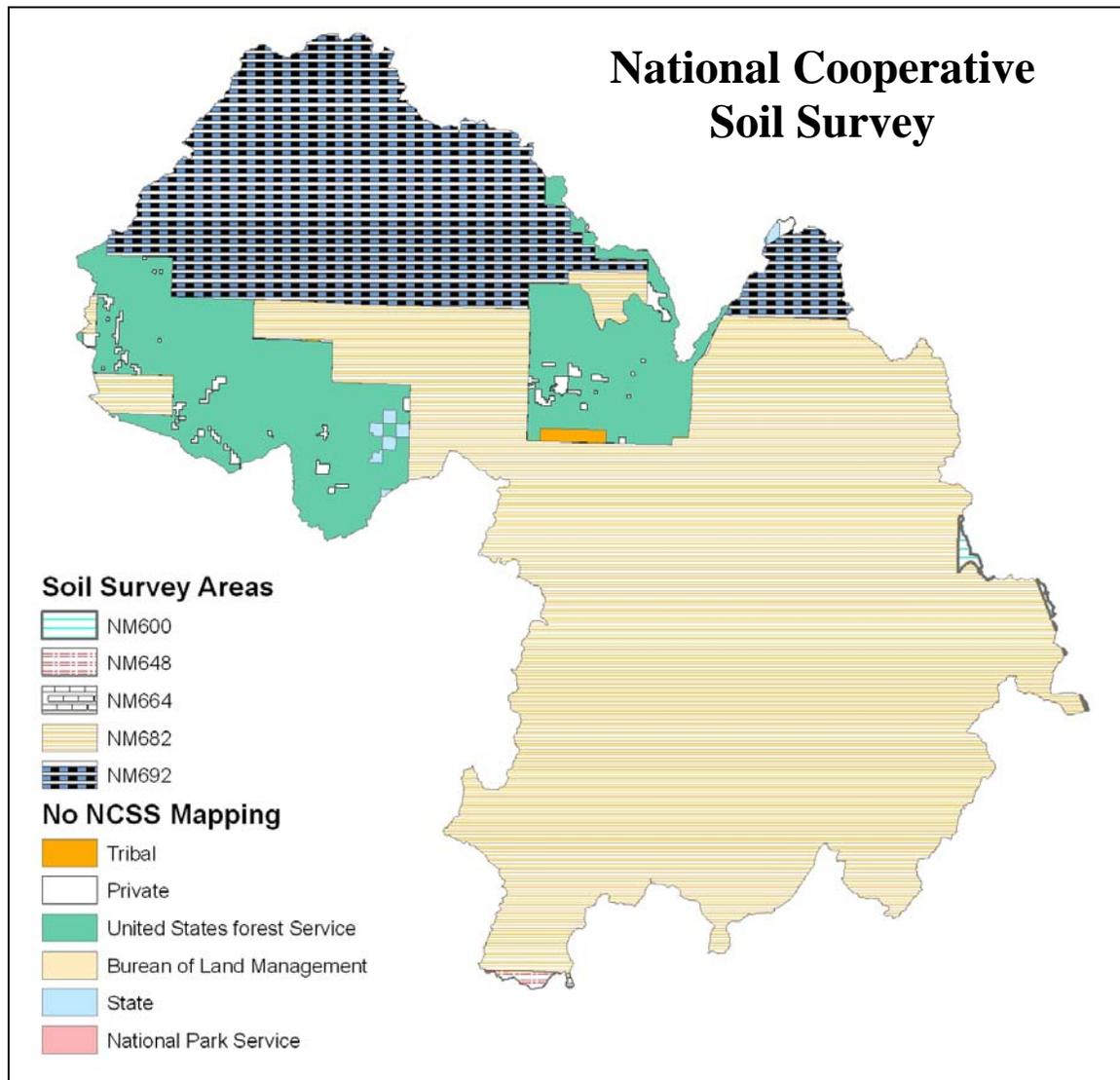
	Conservation Practice	Count of Practices	Total
<b>Distance Practices</b>	Fence	6	30,830 ft.
	Pipeline	6	23,040 ft
<b>Count Practices</b>	Grade Stabilization Structure	1	7
	Pumping Plant	3	3
	Water Well	1	1
	Watering Facility	11	11
	Pond	1	1

Table 9. Location specific 2008 planned conservation practices.



## Soil Resource Inventory

Of the 1.6 million acres in the Rio San Jose watershed, 1.4 million acres have a certified Soil Survey Geographic Database - National Cooperative Soil Survey (NCSS) inventory. This represents 84% of the area. The majority of the remaining area (92%) is managed by the USDA-USFS who inventories soil resources with Terrestrial Ecosystem Surveys. NCSS soil resource inventories have been conducted on 5 distinct regions including lands managed by the Bureau of Land Management and the State of New Mexico, as well as those that are privately held.



**Figure 11. National Cooperative Soil Survey coverage.**



## Soil Resource Inventory

In order to evaluate the susceptibility of erosion within the Rio San Jose watershed, a model was developed using Soil Survey Geographic Database (SSURGO) information. The soil properties saturated hydraulic conductivity, soil loss tolerance, and wind erodibility group were used in conjunction with slope to assess soil mapunit potential for erosion. Saturated hydraulic conductivity and slope are reported in SSURGO databases as interval/ratio data whereas wind erodibility and soil loss tolerance are ordinal data. Data transformations for the model are listed -

SSURGO Value	Nominal Description	Model Rank
<b>Saturated Hydraulic Conductivity</b>		
$\mu\text{m} / \text{s}$		
705.0 - 100.0	Very High	0
100.0 - 10.0	High	1
10.0 - 1.0	Moderately High	2
1.0 - 0.1	Moderately Low	3
0.1 - 0.01	Low	4
<b>Slope %</b>		
0 - 5		0
5 - 10		1
10 - 15		2
15 - 25		3
> 25		4
<b>Soil Loss Tolerance</b>		
5	High Tolerance For loss	0
4	↓	1
3	↓	2
2	↓	3
1	Low Tolerance For Loss	4
<b>Wind Erodibility Group</b>		
1	Very High	4
2	Very High	4
3	High	3
4	High	3
4L	High	3
5	Moderate	2
6	Moderate	2
7	Moderate	1
8	Slight	0

Table 10. Soil erosion model criteria.



## Soil Resource Inventory

For each soil map unit (discrete delineation), the soil properties (named above) of the dominant soil type was used as the condition to be evaluated in the susceptibility to erosion model. Miscellaneous areas such as gravel pits, water, riverwash, etc. were excluded from evaluation. Possible range of values for each map unit are 0 – 16. Increasing values represent a higher susceptibility to soil erosion.

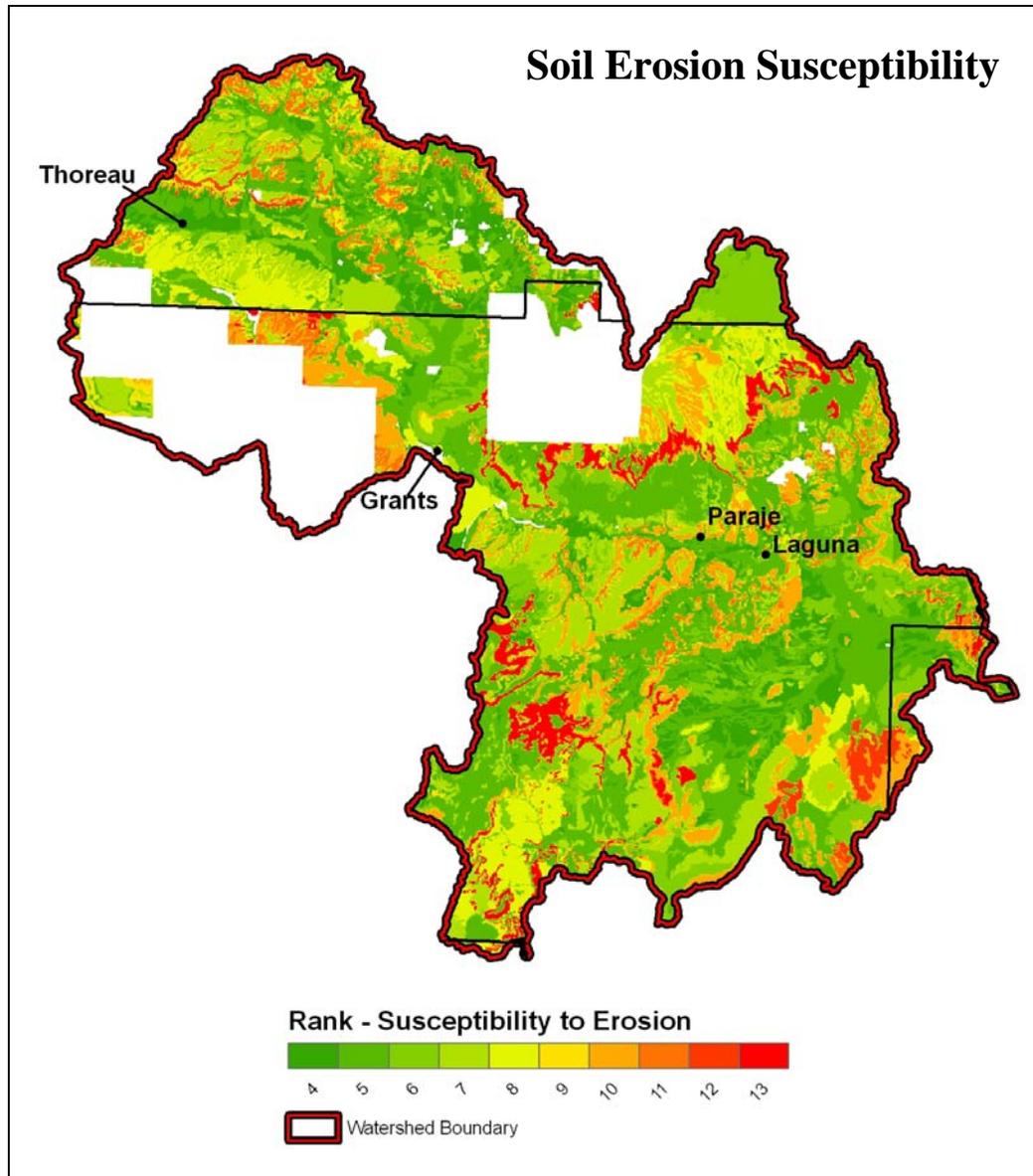


Figure 12. Rio San Jose watershed soil erosion potential.



**Soil Resource Inventory**

Rank	Acres	% of Area
4	146,215	11
5	439,385	32
6	163,643	12
7	221,791	16
8	116,094	8
9	18,032	1
10	131,564	9
11	70,152	5
12	21,174	2
13	60,669	4

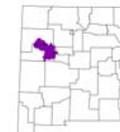
**Table 11. Soil erosion potential results.**



**Socioeconomic Data <sup>11</sup>**

County	Total pop.	Total Urban	Total Rural	Total Rural; Farm	Total Rural; Nonfarm	Total Hispanic or Latino	Total White	Total Black or African American	Total American Indian and Alaska Native	Total Asian	Total Native Hawaiian and Other Pacific Islander	Total Some other race	Total Two or more races	Family median income in 1999
Catron	3,543	---	3,543	173	3,370	668	3,129	7	107	12	---	198	90	30,742
Cibola	25,595	10,279	15,316	194	15,122	8,441	10,122	217	10,276	146	5	4,038	791	30,714
McKinley	74,798	29,404	45,394	548	44,846	9,303	12,309	305	55,732	335	32	4,057	2,028	26,806
Socorro	18,078	8,422	9,656	340	9,316	8,782	11,338	119	2,017	167	---	3,689	748	29,544
Valencia	66,152	53,074	13,078	366	12,712	36,363	44,139	769	2,054	300	50	15,957	2,883	37,157

Table 12. Socioeconomic data for counties overlapping with the Rio San Jose watershed.



## **References**

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3. United States Geological Survey – National Land Cover Dataset

<http://landcover.United States Geological Survey.gov/>

4. Southwest Region Gap Analysis Project (SWReGAP).

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<http://www.epa.gov/owow/tmdl/>

7. New Mexico Environment Department – Water Quality Control Commission

<http://www.nmenv.state.nm.us/wqcc/index.html>

8. New Mexico Office of the State Engineer

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9. New Mexico Natural Heritage

<http://nhnm.unm.edu/>

10. Southwest Exotic Plant Mapping Program -

<http://www.invasiveweeds.com/mapping/welcome.html>

11. United States Census Bureau

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## **Appendix A**

### BASIC FEDERAL STATUS DESIGNATIONS

#### **LE = Listed Endangered**

Species for which a final rule has been published in the Federal Register to list the species as endangered. Species is legally protected by the Endangered Species Act.

#### **LT = Listed Threatened**

Species for which a final rule has been published in the Federal Register to list the species as threatened. Species is legally protected by the Endangered Species Act.

#### **PE = Proposed Endangered**

Species for which a proposed rule has been published in the Federal Register to list the species as endangered

#### **PT = Proposed Threatened**

Species for which a proposed rule has been published in the Federal Register to list the species as threatened.

#### **C or CN = Candidate for Listing**

Substantial information exists in U.S. Fish and Wildlife Service files on biological vulnerability to support proposals to list as endangered or threatened.

#### **SC = Species of Concern**

The terms "Species of Concern" or "Species at Risk" should be considered as terms-of-art that describe the entire realm of taxa whose conservation status may be of concern to the US Fish and Wildlife Service, but neither term has official status (currently all former C2 species).

#### **PDL = Proposal for delisting**

Species for which a final rule has been published in the Federal Register to delist the species.

#### **XN = Non-essential Experimental Population**

Species for which a population has been artificially established in the wild which is not essential to the survival of the species in the wild.

#### **T(S/A) = Listed as Threatened Due to Similarity of Appearance**



## **Appendix A**

### STATE STATUS DESIGNATIONS FOR ANIMALS

#### **E = Endangered**

Any species or subspecies whose prospects of survival or recruitment in New Mexico are in jeopardy.

#### **T = Threatened**

Any species or subspecies that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in New Mexico.

### STATE STATUS DESIGNATIONS FOR PLANTS

**E = Endangered** - The taxon is listed as threatened or endangered under the provisions of the Federal Endangered Species Act (16 U.S.C. Sections 1531 et seq.), or is considered proposed under the tenets of the act [10-29-85,]; or the taxon is a rare plant across its range within the state, and of such limited distribution and population size that unregulated taking could adversely impact it and jeopardize its survival in New Mexico. [10-29-85, 8-31-95]

**SoC = Species of Concern** - A New Mexico plant species, which should be protected from land use impacts when possible because it is a unique and limited component of the regional flora.



## **Appendix A**

### BASIC GLOBAL RANKS

#### **GX = Presumed Extinct**

Believed to be extinct throughout its range. Not located despite intensive searches and virtually no likelihood that it will be rediscovered.

#### **GH = Possibly Extinct**

Known only from historical occurrences. Still some hope of rediscovery.

#### **G1 = Critically Imperiled**

Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

#### **G2 = Imperiled**

Imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

#### **G3 = Vulnerable**

Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations) , or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals

#### **G4 = Apparently Secure**

Uncommon but not rare, and usually widespread. Possibly cause for longterm concern. Typically more than 100 occurrences globally or more than 10,000 individuals.

#### **G5 = Secure**

Common, typically widespread and abundant.



## Appendix A

### BASIC STATE RANKS

#### **SX = Presumed Extirpated**

Believed to be extirpated. Not located despite intensive searches and virtually no likelihood that it will be rediscovered.

#### **SH = Possibly Extirpated**

Known only from historical occurrences. Still some hope of rediscovery.

#### **S1 = Critically Imperiled**

Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

#### **S2 = Imperiled**

Imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

#### **S3 = Vulnerable**

Vulnerable in the state either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations) , or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals

#### **S4 = Apparently Secure**

Uncommon but not rare, and usually widespread. Possibly cause for longterm concern. Typically more than 100 occurrences in the state or more than 10,000 individuals.

#### **S5 = Secure**

Common, typically widespread and abundant.

### VARIANT STATE RANKS

#### **S#S# = Range Rank**

A numeric range rank (e.g., S2S3) is used to indicate uncertainty about the exact status of a taxon.

#### **SA = Accidental**

Accidental or casual in NM. In other words, infrequent and outside usual range. Includes species (usually birds or butterflies) recorded once or only a few times at a location.



## **Appendix A**

### **SE = Exotic**

An exotic established in state; may be native elsewhere in North America; includes fish native to NM but introduced into watersheds where the species is non-native. An exotic established in NM may be assigned a numeric rank (e.g. SE2) to indicate its status, as defined for S1 through S5.

### **SU = Unrankable**

Currently unrankable due to lack of available information about status or trends.

### **HYB = Hybrid**

### **SRF = False Report**

Element reported in NM but the report is known to be invalid.

### **SNR = Not Ranked**

State conservation status not yet assessed.

### **S? = Unranked**

Rank not yet assessed.

### **RANK QUALIFIERS**

#### **? = Inexact numeric rank**

Denotes inexact numeric rank.

#### **Q = Questionable taxonomy**

Taxonomic status is questionable; numeric rank may change with taxonomy.

#### **C = Captive or cultivated only**

Taxon at present is extant only in captivity or cultivation, or as a reintroduced population not yet established.

#### **B = Breeding**

The associated rank refers to breeding occurrences of mobile animals.

#### **N = Non-breeding**

The associated rank refers to non-breeding occurrences of mobile animals.

#### **Z = Moving**

Occurs in the state, but as a diffuse, usually moving population; difficult or impossible to map static occurrences.

