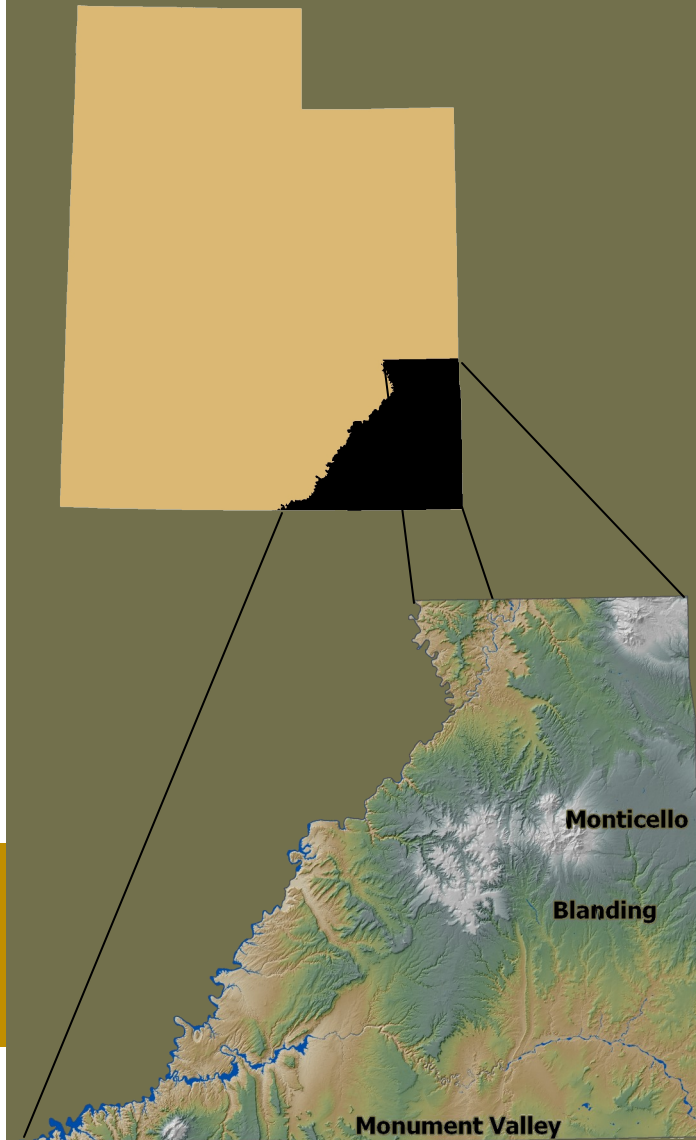


# San Juan County Resource Needs Assessment

April 2011

*Conserving Natural Resources For Our Future*

San Juan Conservation District



## Acknowledgments

### **San Juan Conservation District** *with the:*

Utah Association of Conservation Districts  
Utah Department of Agriculture and Food  
Natural Resources Conservation Service

### *In partnership with the:*

### **Utah Conservation Commission**

Utah Association of Conservation Districts  
Utah Department of Agriculture and Food  
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Utah Department of Natural Resources  
Utah Department of Agriculture and Food  
Utah School of Institutional Trust Lands Administration  
Utah State University Extension  
Utah Weed Supervisor Association

### **UWRI/UtahPCD**

### **Utah Watershed Restoration Initiative**

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#### **State Agencies and Organizations:**

Utah Association of Conservation Districts  
Utah Department of Agriculture and Food  
Utah Department of Community and Culture  
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Utah Department of Natural Resources  
Utah Resource Conservation & Development Councils  
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Utah Energy Office

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U.S. Fish and Wildlife Service  
U.S. Department of Agriculture  
U.S. Forest Service  
Natural Resources Conservation Service  
Agriculture Research Service  
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#### **Other**

State Historical Preservation Office  
Governor's Office of Planning and Budget  
San Juan County

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*A special thanks to the San Juan Conservation District for their time and effort in making this resource needs assessment a success.*

*Left to right: J. Merlin Grover, Keith Ivins, Rigby Wright, Bob Barry, and Blaine Nebeker.*

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# San Juan County Resource Needs Assessment: Executive Summary



Photo courtesy of Roger Barton

*Erosion control using strip tillage on a San Juan County dryland farm.*

## Why a Resource Assessment?

The San Juan Conservation District has developed this resource assessment with the goal that conservation efforts in the county address the most important local resource needs. This report identifies natural and social resources present in San Juan County and details specific areas of concern. Local, state, and regional entities can use this assessment to develop county resource management plans or to target conservation assistance needs.

We recognize that all who could have provided information may not have had the opportunity. This document is dynamic and will be updated as additional information is available. Your comments are requested:

San Juan Conservation District  
PO Box 219  
Monticello, Utah 84535  
(435) 587-2724

## Natural Resource Priorities and Concerns

The San Juan Conservation District has identified five natural resource priorities and concerns. These priorities receive special emphasis because of their immediate significance to San Juan County:

**Soil Conservation & Soils of Local Importance:** Erosion, future designation of locally important soils

**Water Conservation:** Storage, delivery, and use

**Sustainable Agriculture:** Production and profitability

**Wildlife Management:** Elk depredation, sage-grouse and other wildlife concerns

**Energy Development & Alternative Energy:** Energy and alternative energy development opportunities

## General Resource Observations

Natural and social resources are categorized as Soil, Water, Air, Plants, Animals and Humans (SWAPA + H). This assessment describes the general condition of these resources and highlights additional concerns in each category. As opportunities become available to address these issues, and as circumstances change, their emphasis should be elevated accordingly. This document will discuss the following topics under the SWAPA + H sections:

**Soil:** Prime Farmland and Farmland of Statewide Importance, San Juan County Soils

**Water:** Water Quantity and Storage, Quality, and Irrigation Water

**Air/Climate:** Air Quality, Climate, NRCS Snow Survey

**Plants:** Crops and Pasture, Rangeland, Forestland and Woodland

**Animals:** Livestock, Endangered and At-Risk Species, Aquatic Life, Game

**Humans:** Population, Economy, Labor Market, Recreation

# Introduction

## The Conservation Movement

The Dust Bowl of the 1930's brought the beginning of national programs for conserving soil and water resources in the United States. On April 27, 1935, Congress declared soil erosion “a national menace” and established the Soil Erosion Service. Since then, the agency was changed to the Natural Resources Conservation Service (NRCS). In May of 1936 farmers were allowed to set up their own districts to direct soil conservation practices. Today, Utah has thirty-eight conservation districts divided into seven zones.

## Conservation Progress

San Juan Conservation District has been active in conserving the natural resources in San Juan County since its establishment. Board members serve on various other boards in efforts to address natural resources needs. Resource assessments have provided a framework for future direction in addressing those needs. This resource assessment continues to identify and address the resource concerns of San Juan County.

## Resource Assessment Outreach

In 2010, the San Juan County Local Work Group held a meeting to discuss and update the resource concerns for San Juan County. Those attending included San Juan Conservation District board members, the Utah Department of Agriculture, the Utah Division of Water Quality, USDA-Farm Service Agency, USDA-Natural Resources Conservation Service, local government officials, and others. The San Juan Conservation District later held a public meeting with federal, state, and local agencies to determine areas and resources of concern in the county. These meetings allowed the identification of priority resource concerns for San Juan County. The groups discussed the reasoning behind concerns and recommendations for addressing them.

*Conservation districts provide local leadership and education to connect private property owners with state and federal assistance to improve, protect and sustain Utah's soil, water and related natural resources.*

Photo courtesy of NRCS



*A great “roller” moves across the land during the Dust Bowl.*

Photo courtesy of Roger Barton



*The San Juan County resource assessment outreach meeting held May 11, 2010 in Blanding. Commissioner Leonard Blackham, Utah Department of Agriculture and Food, led discussions on the condition and challenges of the resources in San Juan County. Valuable inputs were made by those attending regarding resource concerns in the area.*

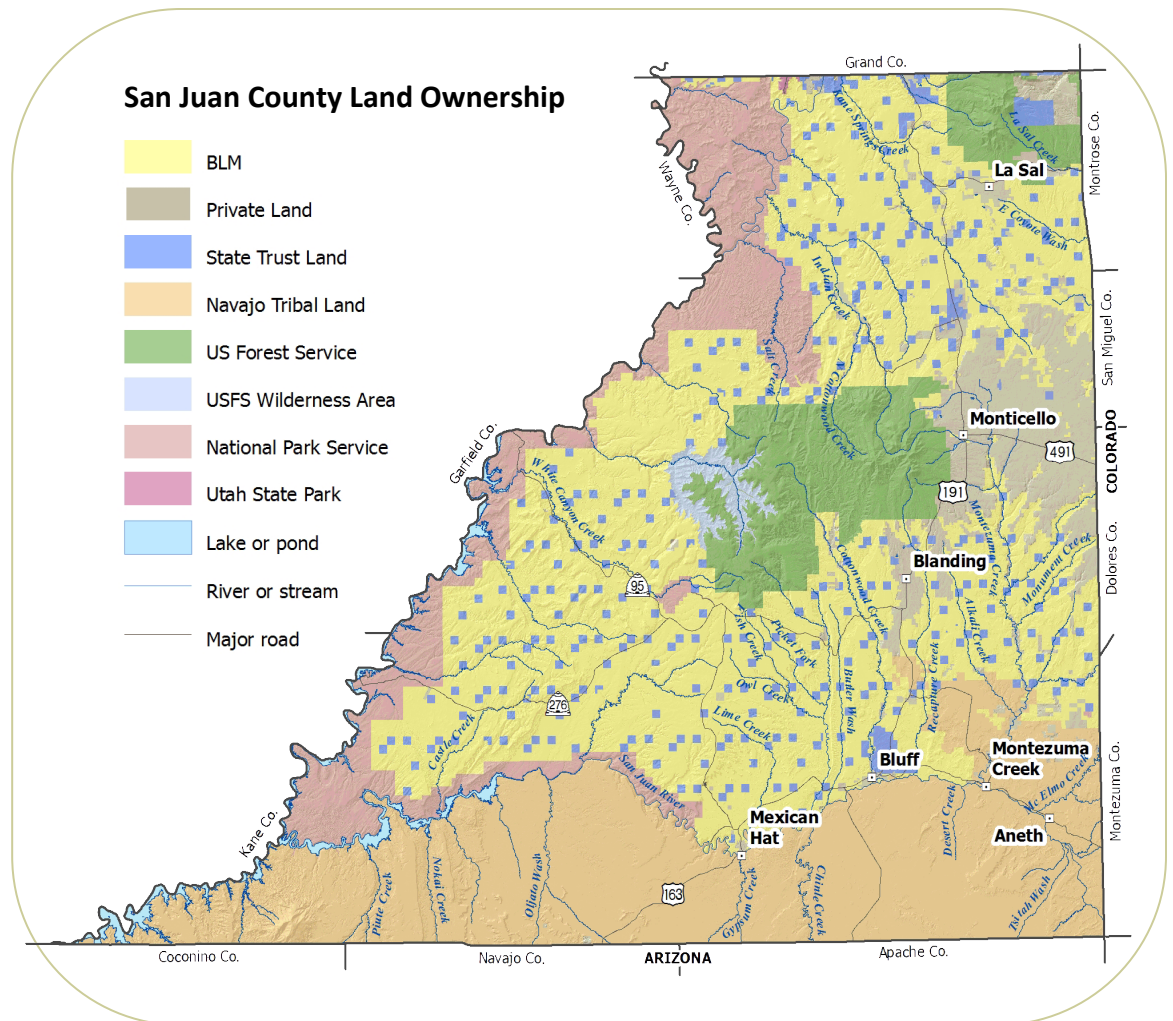
# San Juan County Overview

## SAN JUAN COUNTY

San Juan County is located in the far south-eastern portion of Utah within the Colorado Plateau along the Colorado and Arizona borders. Founded in 1880, San Juan County is the largest county in Utah with approximately 7,884 square miles or 5.2 million acres. Elevations range widely from 3,700 feet to over 13,000 feet.

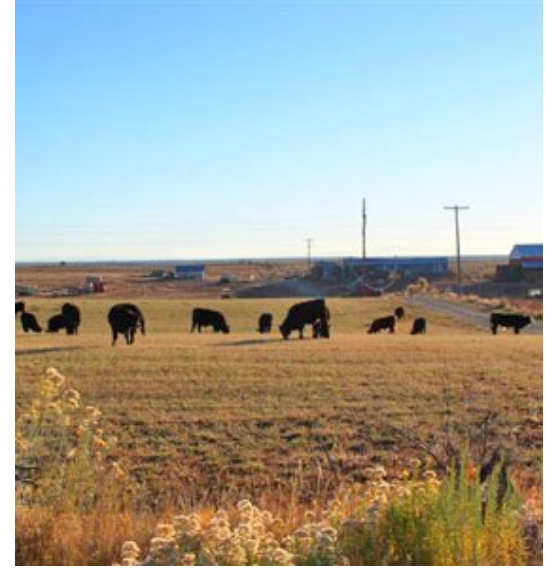
Some of the more famous recreation attractions within San Juan County are Canyonlands National Park, Lake Powell, Monument Valley, Edge of the Cedars State Park, Hovenweep National Monument, Natural Bridges National Monument, the Four Corners area and the Navajo and Ute Indian Reservations. Blanding and Monticello serve as the two major cities. San Juan County is known for its dryland farms of wheat, safflower, sunflowers, and pinto beans. The area also produces large organic grain crops and abundant grazing land. The county is also home to one of the few operating uranium mills in the United States. Copper mining and oil and gas production are also found in the county.

In 2009, the total population of San Juan County was 15,643, with over 50% of the county's population being American Indians of the Navajo Nation and Ute tribes.<sup>1</sup> Summer precipitation patterns are typical for the south west with monsoonal storms, with heavier snow accumulations in the higher elevations during the winter months. The average growing season is June 1 through October 1, with slightly longer periods in the lower elevations. The annual precipitation within the county ranges between six and twenty-two inches per year.<sup>2</sup>



<sup>1</sup> Utah Department of Workforce Services

<sup>2</sup> Soil Survey of San Juan County, Utah, Central Part



## SAN JUAN COUNTY

Photo credits clockwise from top left: Tower Ruin, [sanjuancounty.org](http://sanjuancounty.org); wheat by Alexander Hafemann; Ivins farm and ranch by Wayne Urie, NRCS; San Juan County cowboys by Jim Keyes, USU Extension; Valley of the Gods, [sanjuancounty.org](http://sanjuancounty.org); San Juan County sunflower by Roger Barton, UACD.

# Priority Resources and Concerns

## SOIL CONSERVATION & SOILS OF LOCAL IMPORTANCE

Soil is one of the most valuable resources in San Juan County for many reasons. One major reason is the county's many dryland farms. Since healthy topsoil is critical to sustainable dryland farming, its preservation is generally considered the most important long-term goal of a dryland farming operation. Soil conservation is also a priority concern because of the importance of maintaining healthy forests and rangeland in the county.

### Challenges

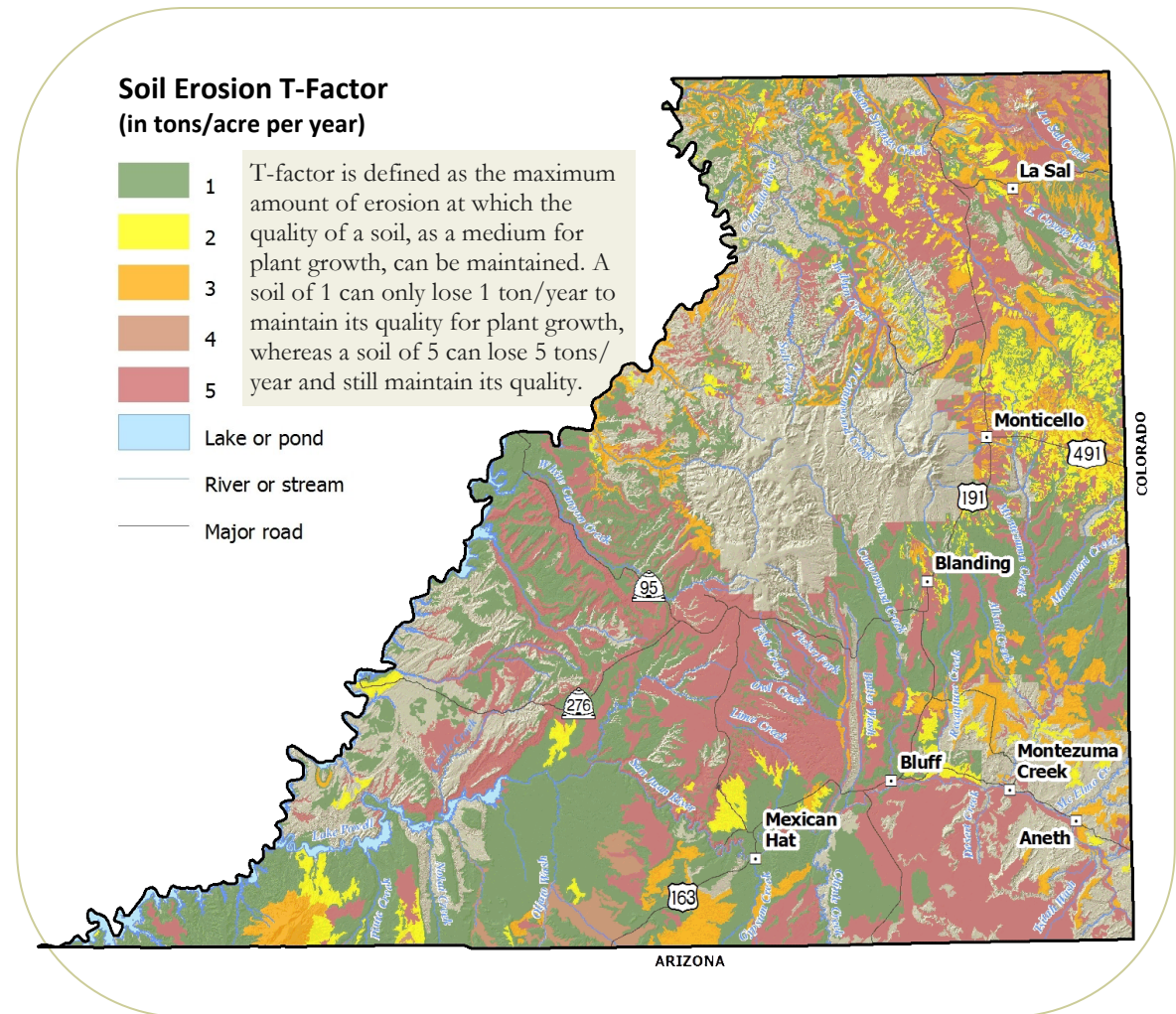
Many factors affect the soil including erosion, vegetation, economic conditions, and governmental regulations that affect land management.

### Policy

- Wilderness, land access, and regulations limiting the planting of vegetation for ground cover and soil protection
- Threatened and endangered species impacts potentially restricting land management and soil protection
- Idle and therefore erodible farm land due to inability to finance operation

### Resource Management

- Decreasing native vegetation and ground cover due to noxious and invasive weeds
- Vegetative monocultures reducing water infiltration and increasing erosion
- Erosion from sheet, rill and wind removing top soil from productive agricultural land
- Lack of erosion and water control on road improvements and structures
- Decrease in water storage capacity due to sediment
- Drought and resulting decreased vegetative cover for soil protection
- Irresponsible recreational practices decreasing soil health
- Overgrazing which creates exposed soil





## Needed Actions

The San Juan Conservation District has determined that soil in San Juan County can be benefited by the following:

### Policy

- Consider local needs and impacts when making regulations affecting soil
- Provide opportunities and incentives for individuals to enter/remain in the agricultural industry
- Develop and enforce planning and zoning ordinances that protect soil
- Promote cost sharing with private forest owners to improve health and sustainability of their forests
- Continue promotion and financial incentives for terracing, sediment retention ponds, conservation tillage practices, and other erosion control practices
- Designate locally important soils in San Juan County as soils with 0%-8% slope and thirty inches or greater of soil depth

### Resource Management

- Manage wildlife numbers at levels consistent with healthy soil capabilities
- Responsible and innovative grazing management
- Watershed management including using prescribed fire to avoid catastrophic fire, encourage aspen regeneration, remove dead standing trees, manage bark beetle impacts, and increase vegetation and diversity in plant communities
- Enforce proper construction of roads and trails
- Control and manage noxious and invasive weeds

### Outreach

- Public education on the benefits of responsible recreation
- Encourage soil conservation practices



*Terracing efforts on a San Juan County dryland farm*

Dryland farm ground is particularly susceptible to erosion. Increased support, assistance, and education for land managers is essential in maintaining healthy top soils in San Juan County.

### No-Till Conservation

Recent trials using no-till conservation in San Juan County have had no apparent success. Until this practice is proven effective, the San Juan Conservation District recommends that local consideration be given when applying for federal cost share assistance through the USDA and other programs. Weed and insect control on organic farms require tillage and non-use of chemicals. Conventional or minimum tillage is conducive to local dryland farms and should receive priority over no-till practices in San Juan County.

Additional no-till trials using USDA-NRCS recommended practices are scheduled to begin with the 2011 growing season to further investigate the feasibility of no-till conservation in the county.

# Priority Resources and Concerns

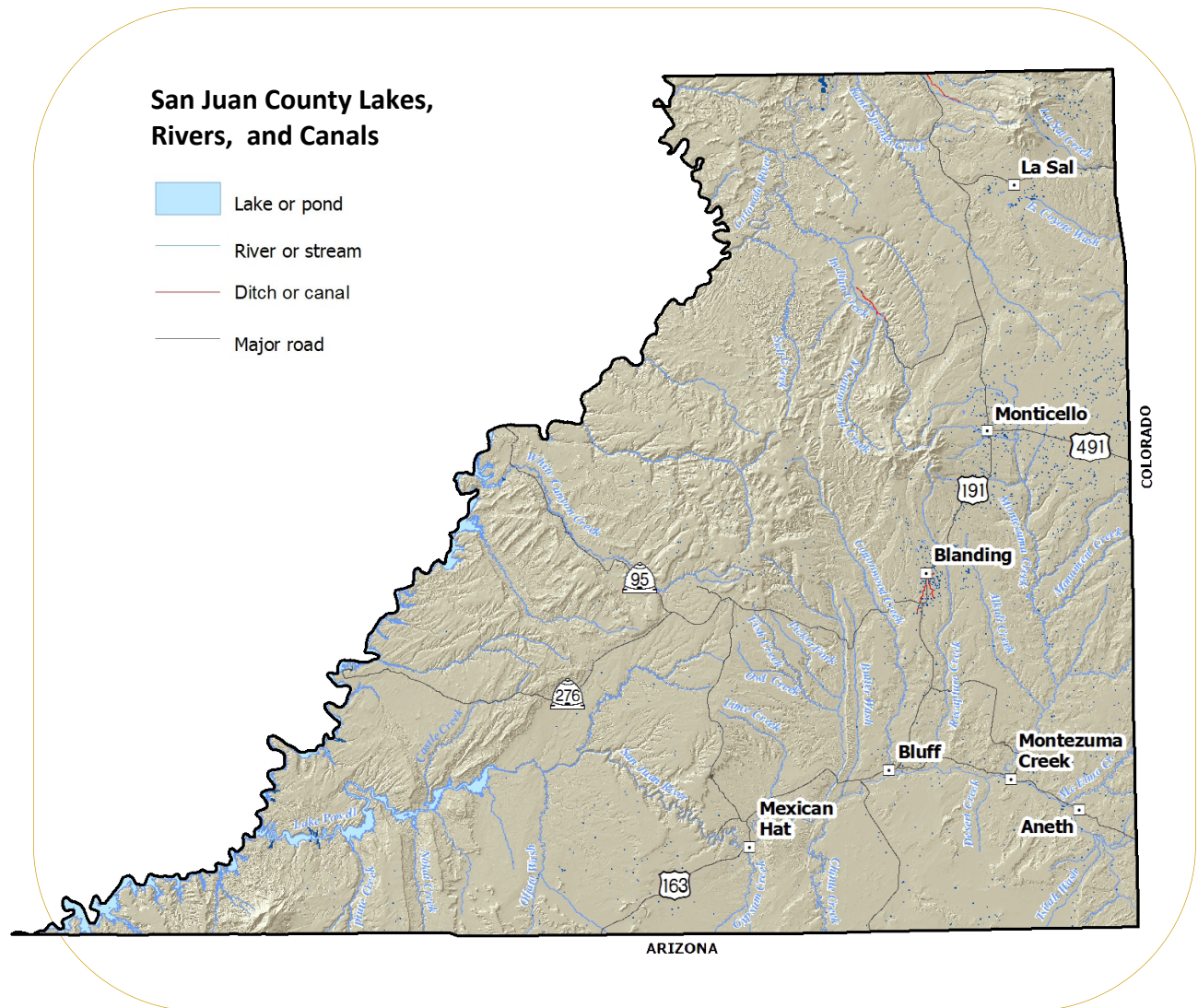
## WATER CONSERVATION

Water conservation is a priority concern for San Juan County. Because water supplies are very limited, proper management and conservation of water resources is essential.

### Challenges

San Juan County water users face many challenges that impact how water is developed, controlled and used.

- Regulations making it difficult to construct and maintain additional storage facilities, or make improvements on private land
- Excessive runoff from fields, rangeland, forests, improperly constructed roads/trails and development areas
- Sediment accumulation in reservoirs and ponds reducing water holding capacity
- Lack of vegetation and ground cover to slow water flows and recharge groundwater
- Salts entering the Colorado River system from runoff
- Lack of wells due to expense of drilling and inherent risk of not finding water



## Needed Actions

There are many improvements that can be made which could enhance the water quality and improve water conservation in San Juan County:

### Policy

- Alter government regulations to allow community needs and local considerations to control construction and maintenance of additional storage facilities and land improvements, and make water storage and development a priority
- Develop and enforce planning and zoning ordinances dealing with road, trail and other development projects to reduce impacts to local water sources
- Provide cost share payments for drilling wells (wet and dry) to encourage development
- Participate in the Colorado River Basin Salinity Control Program

### Resource Management

- Construct additional terraces and vegetative planting
- Improve water supplies for livestock and wildlife
- Reduce sediment loading into reservoirs, lakes and ponds through upstream watershed projects that promote erosion control, including improving stream bank stabilization

### Outreach

- Encourage proper construction and use of sewage and septic systems
- Encourage proper construction of roads and trails to reduce runoff, minimize erosion impacts and allow water to penetrate soil
- Promote forest health and sustainability on private forestland by providing education and cost sharing with private forestland owners
- Provide assistance for proper use and disposal of pesticides and herbicides
- Utilize all available water storage rights



*Water structures such as this pond are beneficial by capturing sediment and containing water runoff for wildlife and livestock use.*

# Priority Resources and Concerns

## SUSTAINABLE AGRICULTURE

Sustainable agriculture can have numerous goals and facets, but it ultimately strives to bring **increased profits, sound stewardship of the air, water and soil, and improved quality of life for farming communities**. Because of the important role of agriculture in San Juan County's economy, land health, and way of life, sustainable agriculture is a priority concern.

### Challenges

The San Juan Conservation District has identified many factors that challenge the sustainability of agriculture in San Juan County. Some of these include:

#### Policy

- Inability to obtain financing for new farm purchases
- Low commodity prices and high financial inputs drive the financing market and discourage active and new farmers
- Government regulations and restrictions that control agriculture practices are becoming increasingly restrictive and have made it difficult for producers to comply and still make a living
- Increasing inheritance taxes preventing the transfer of farms from generation to generation

#### Resource Management

- Lack of noxious and invasive weed control on cropland
- Excessive wildlife numbers and crop depredation
- Creation of small farmsteads which quickly become unmanageable and covered with weeds



The Sustainable Agriculture Research and Education, or SARE, advances farming systems that are profitable, environmentally beneficial and good for communities through a nationwide competitive grants program. For more information on sustainable agriculture and how you can help, visit the Western SARE website at [wsare.usu.edu](http://wsare.usu.edu)

## Needed Actions

The San Juan Conservation District has a number of recommendations that could improve sustainable agriculture in San Juan County:

### Policy

- Increase offerings of cost sharing programs with existing, new, and beginning farmers and ranchers to assist with the installation of efficient on-farm improvements
- Increase financial opportunities in the form of low interest loans for farm purchases and operations
- Compensation for wildlife depredation from applicable state agencies

### Resource Management

- Protect cropland by controlling noxious weeds within cropland boundaries and surrounding areas
- Improve management of wildlife on private land
- Reduce overall regulations affecting agriculture which make it difficult to operate and create additional expense
- Reduce or eliminate inheritance taxes

### Outreach

- Improve existing educational opportunities and programs to educate high school students about the financial and production aspects of agriculture
- Educate current agricultural producers about more efficient cropping practices or alternative crops with more profit potential

The San Juan Conservation District is willing to assist federal, state, and local governments in order to keep farms intact and productive, and hope that these measures will allow agriculture to remain a viable industry in San Juan County.

## Field Bindweed (*Convolvulaceae*) aka “Morning Glory”



*Field Bindweed invades a San Juan County sunflower crop.*



Photo Courtesy of Nathan Belliston

Field bindweed, a common dryland farm invader in San Juan County, is a perennial with stems up to six feet long growing prostrate, or it may climb nearby vegetation. Arrow-shaped leaves are up to two inches long. This European native reproduces from both seed and rootstock. It grows in fields, pastures, gardens, road sides, and many other areas. Seed may remain viable in the soil for up to 50 years.<sup>3</sup>

# Priority Resources and Concerns

## WILDLIFE MANAGEMENT

San Juan Conservation District and partners recognize the need for improved management of wildlife and habitat to minimize negative impacts and maximize positive impacts to both private and public lands.

### Elk

Elk herd size has been an area of concern for many years in Utah, and proves to be a major issue in San Juan County today.

### Challenges

- Depredation of crops such as sunflowers, pinto beans, and others
- Increasing elk numbers with limited forage on public lands
- Forced change of crop types being planted

### Needed Actions

- Reduce and balance elk numbers in order to protect private farming, grazing, and forest lands
- Continue efforts to improve and increase forage through habitat manipulation
- Provide compensation to landowners for crop depredation
- Increase partnerships with private, federal, state, local, and wildlife interest groups

Collaboration of private, federal, state, local, and other groups is needed in order to maintain healthy elk herds as well as protect the local agricultural economy.

### Gunnison Sage-Grouse (*Centrocercus minimus*)

San Juan County is home to the only Gunnison Sage-grouse population in Utah. Because of the apparent decline in population and habitat, Gunnison Sage-grouse are listed on the Utah Sensitive Species List as a Species of Special Concern.<sup>5</sup> With declining numbers of the Gunnison Sage-grouse and its habitat, this species is a priority concern in San Juan County.

<sup>4</sup> Utah Division of Wildlife Resources

<sup>5</sup> Gunnison Sage Grouse Conservation Plan



Photo courtesy of UDWR

### Elk

“Depredation of private croplands continues to exist in some areas despite careful management of elk populations. Depredation problems need to be addressed in a timely and efficient manner so that landowners will better tolerate migratory populations of elk.”

*Utah Division of Wildlife Resources, 2010. Statewide Elk Management Plan.*

### Gunnison Sage-Grouse

As their name suggests, these birds inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the dominant plant of necessary habitat. A good understory of grasses and forbs, insects and associated wet meadow areas, are essential in sage-grouse habitat.<sup>4</sup>



Photo courtesy of UDWR

## Gunnison Sage-Grouse continued

### Challenges

- Predators
- Long-term drought
- Large-scale wildfires
- Disease
- Inadequate habitat

### Needed Actions

- Increase predator control to reduce impacts on sage-grouse
- Use of livestock and prescribed fire to rejuvenate vegetation and habitat
- Use of conservation easements or leases, and retention of USDA Conservation Reserve Program (CRP) lands
- Protection and maintenance of habitat, both in quantity and quality

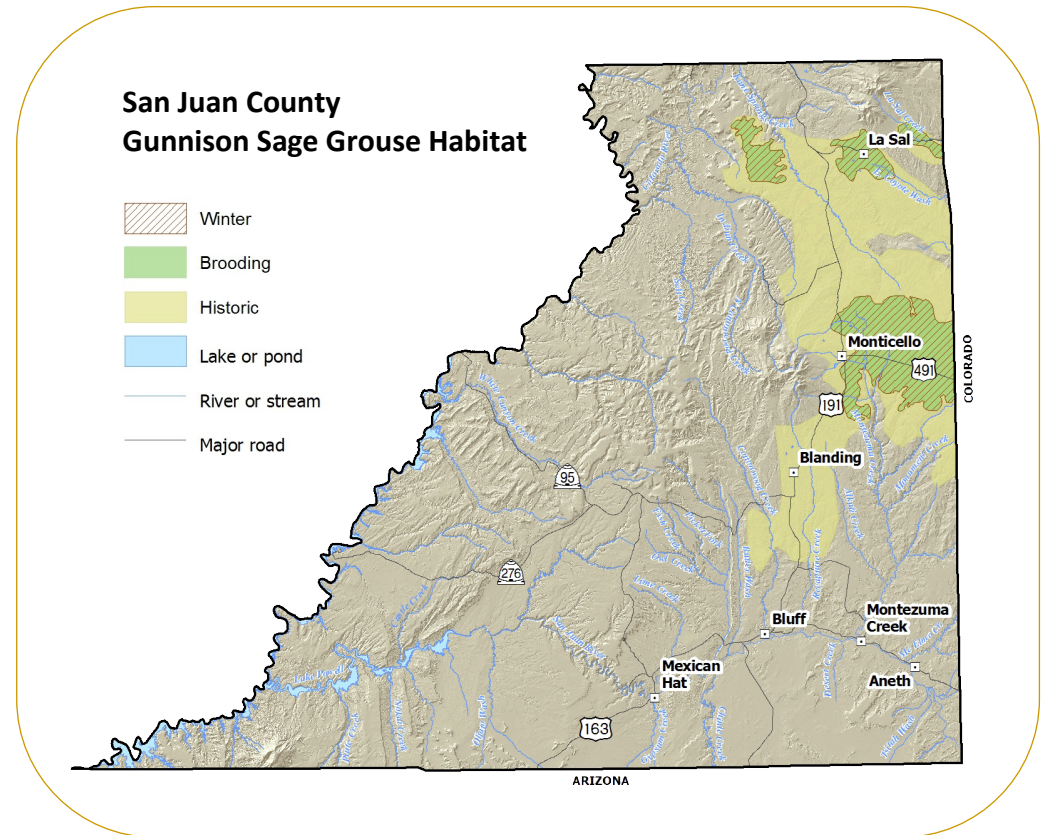
The San Juan Conservation District is currently working with the Monticello/Dove Creek Gunnison Sage-Grouse Local Working Group and has met with DWR officials in efforts to aid in preservation of the species and its habitat. Ongoing cooperative efforts are essential in merely maintaining current populations.

### Other Wildlife Concerns

Additional wildlife concerns are apparent in San Juan County and need special attention.

These concerns include:

- Increased bear and mountain lion numbers affecting livestock and crops
- Wildlife planning and management policies and their possible negative impacts on agriculture
- Pressure from groups to list new species as endangered or threatened without regard to local impact
- Fluctuation of prairie dog numbers and negative impacts on farm and range land when numbers are high
- Re-introduction of new or extirpated species into the county without local consideration
- Lack of public awareness of successful local projects



# Priority Resources and Concerns

## ENERGY DEVELOPMENT & ALTERNATIVE ENERGY

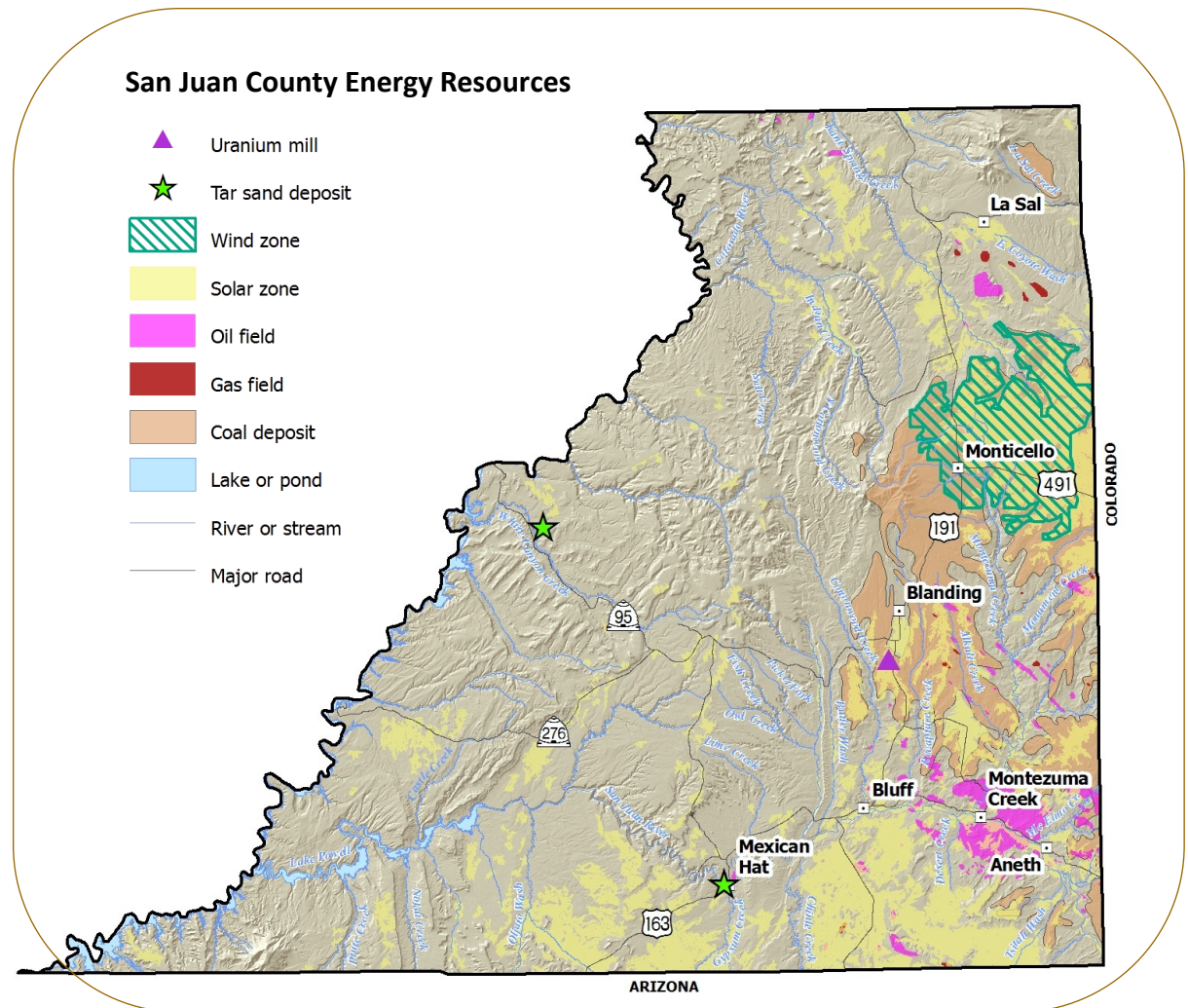
San Juan County has an abundance of potential wind, solar, and oil seed energy opportunities, as well as resources for conventional (oil, natural gas, etc.) energy development. Benefits to be realized by the development of such resources include job creation, increased tax revenues which benefit schools, and overall improvement of the local economy.

### Challenges

Challenges facing the development of energy in the county include:

- Lack of educational opportunities for local citizens on energy development
- Expense of system installation verses income potential
- Lack of sufficient energy potential data
- Federal special land use designations, such as Area of Critical Environmental Concern (ACEC), Wild and Scenic Rivers, Wilderness and/or “wilderness character” lands, Special Recreation Management Areas and Special Cultural Resource Area designations.
- Threatened and endangered species impacts restricting energy development

Other possible challenges which may be presented after or during development include noxious and invasive weeds and road construction impacts.





## Needed Actions

The following list includes actions needed by all stakeholders and interested parties in order to take advantage of the abundant energy resources in San Juan County:

- Provide realistic financial opportunities and incentives for developers and landowners
- Promote energy development through education, coordination and pooling of lands for more efficient development and landowner participation
- Reduce regulation inhibiting energy development
- Enforce development ordinances to protect soil, water and vegetation
- Conduct studies and distribute information determining solar power, hydropower, wind power, and oil seed for food and fuel opportunities

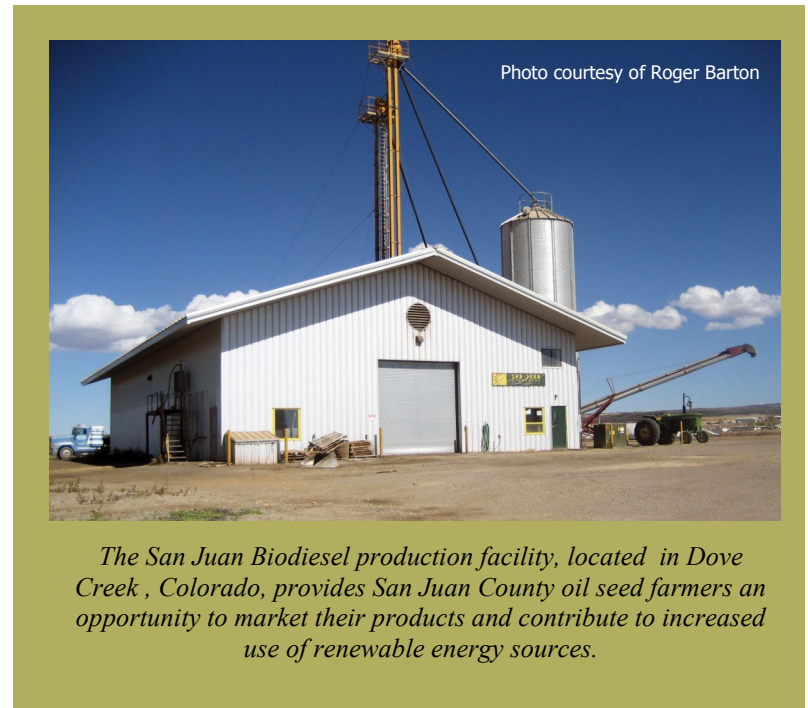
## Wind and Solar Opportunities

San Juan County has a unique potential for alternative energy development, including solar and wind power. A recent study on possible wind power generation in San Juan County conducted by the U.S. Department of Energy and Utah State University determined that wind power generation looks to be a promising possibility. It is noted that wind speeds may not make the sites competitive in Utah's current market of low energy costs, but may be viable if demand increases from higher priced energy markets, such as California.<sup>6</sup>

Many opportunities for solar power generation also exist in the county. The county currently has two very successful solar projects that have provided electricity to operate facilities, namely the Natural Bridges National Monument and the Cal Black Memorial Airport. Both solar power systems provide the majority of the electricity used by the facilities. The county has many large open areas in which solar farms could be developed.<sup>7</sup>

<sup>6</sup> U.S. Department of Energy

<sup>7</sup> State of Utah, Governor's Energy Advisor



“...Wind power is increasingly seen as an important industry that can bolster Utah’s rural communities, creating jobs and generating lease payments for rural landowners and tax revenues for government services and schools.”<sup>6</sup>

*U.S. Department of Energy/Utah State University: An Analysis of State-Level Economic Impacts from the Development of Wind Power Plants in San Juan County, Utah*

# General Resource Observations

## SOIL

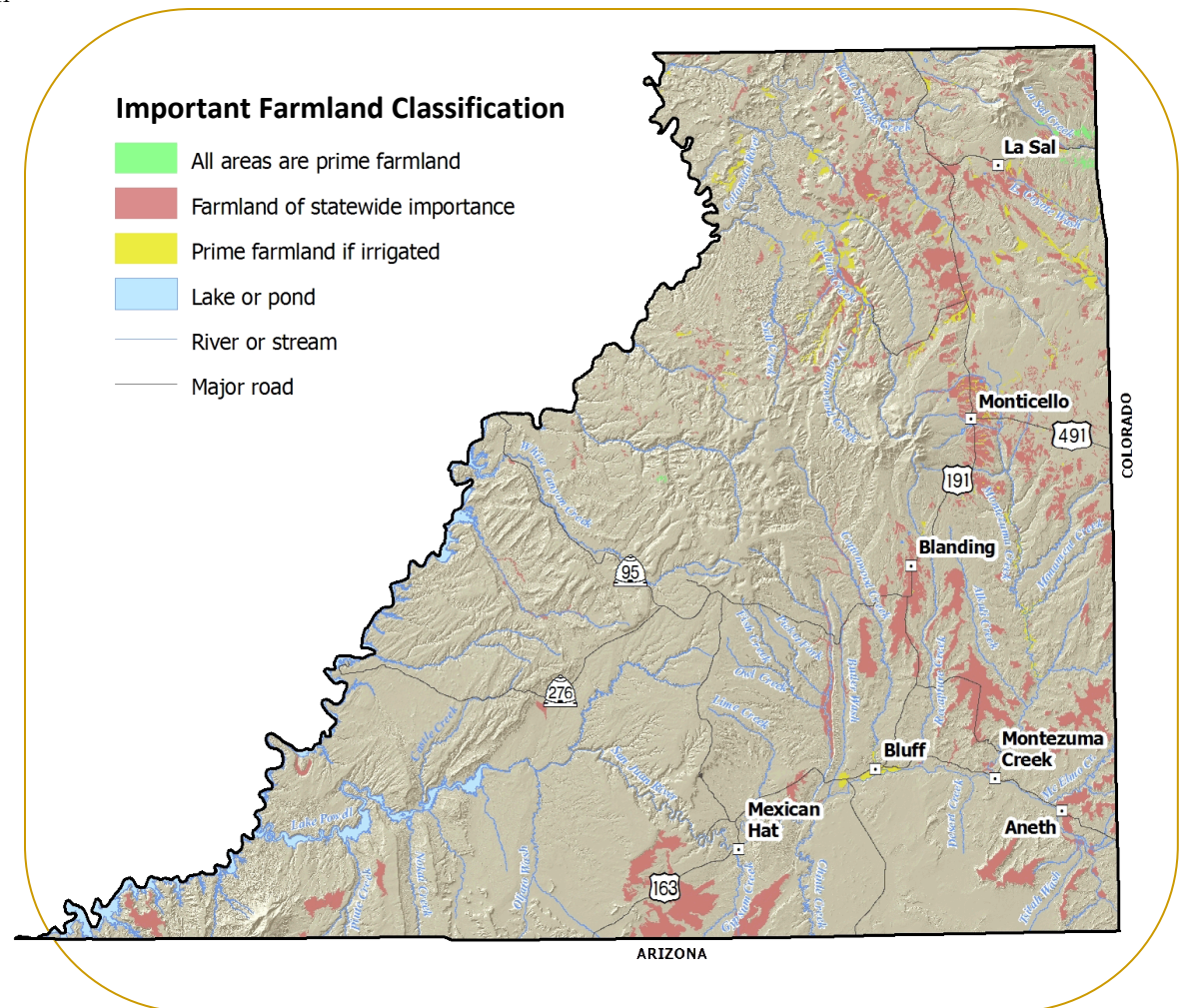
San Juan County soils are typical of those found within the Colorado Plateau, which has unique geological formations and a large variety of soils. Geologic activity long ago created the unique desert and mountain regions which include rivers that cut deep into bedrock making spectacular canyons. The soil is derived from sandstone and limestone parent material. Soils of the Colorado Plateau will vary from loamy to clay, and will also have areas of sand and gravel. It is rare to see large areas with one texture of soil; it is more common to detect different textures intertwined throughout the region. Soils in this area can be very shallow or very deep and are typically well drained or excessively drained. The region also has numerous areas in which bare sandstone can be found. The dominant soil orders in this area are Alfisols, Aridisols, Entisols, and Mollisols.

### Prime Farmland

Prime Farmland is a national designation for land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. There are potentially 38,863 acres of prime farmland in San Juan County; however, these must be irrigated to qualify for this designation. Those irrigated lands that do qualify as Prime farmland amount to about 3,836 acres.

### Farmland of Statewide Importance

Land identified by state agencies as important for agricultural use, but not of national significance can be designated as statewide important farmland. San Juan County has approximately 360,635 acres of potentially statewide important farmland, but the actual is less due to a requirement for irrigation.



## San Juan County Soils

### Using This Map

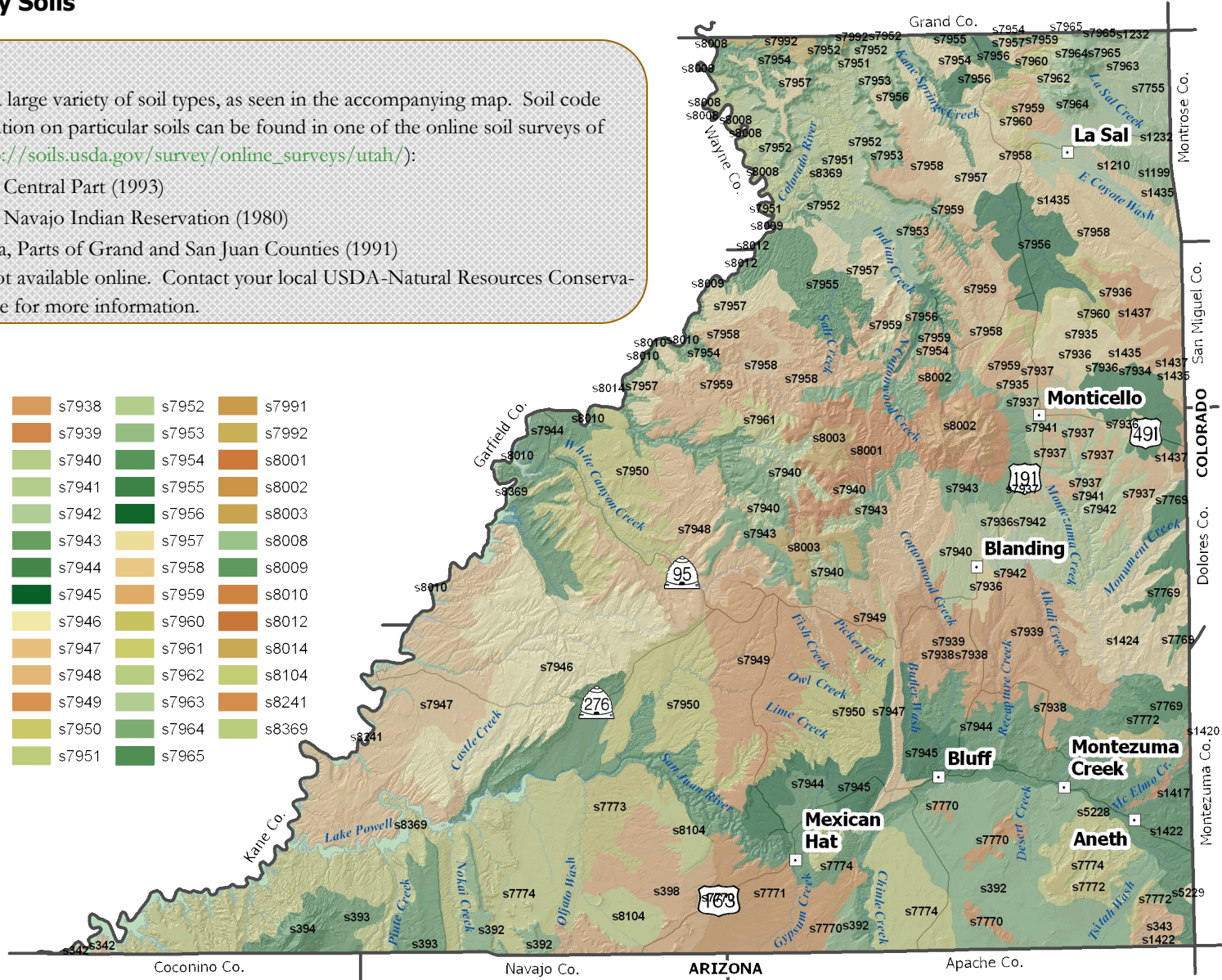
San Juan County has a large variety of soil types, as seen in the accompanying map. Soil code meanings and information on particular soils can be found in one of the online soil surveys of San Juan County ([http://soils.usda.gov/survey/online\\_surveys/utah/](http://soils.usda.gov/survey/online_surveys/utah/)):

- San Juan County, Central Part (1993)
- San Juan County, Navajo Indian Reservation (1980)
- Canyonlands Area, Parts of Grand and San Juan Counties (1991)

\*Some surveys may not be available online. Contact your local USDA-Natural Resources Conservation Service field office for more information.

### Key

s1199	s398	s7938	s7952	s7991
s1210	s5228	s7939	s7953	s7992
s1232	s5229	s7940	s7954	s8001
s1417	s7755	s7941	s7955	s8002
s1420	s7769	s7942	s7956	s8003
s1422	s7770	s7943	s7957	s8008
s1424	s7771	s7944	s7958	s8009
s1435	s7772	s7945	s7959	s8010
s1437	s7773	s7946	s7960	s8012
s342	s7774	s7947	s7961	s8014
s343	s7934	s7948	s7962	s8104
s392	s7935	s7949	s7963	s8241
s393	s7936	s7950	s7964	s8369
s394	s7937	s7951	s7965	



# General Resource Observations

## WATER

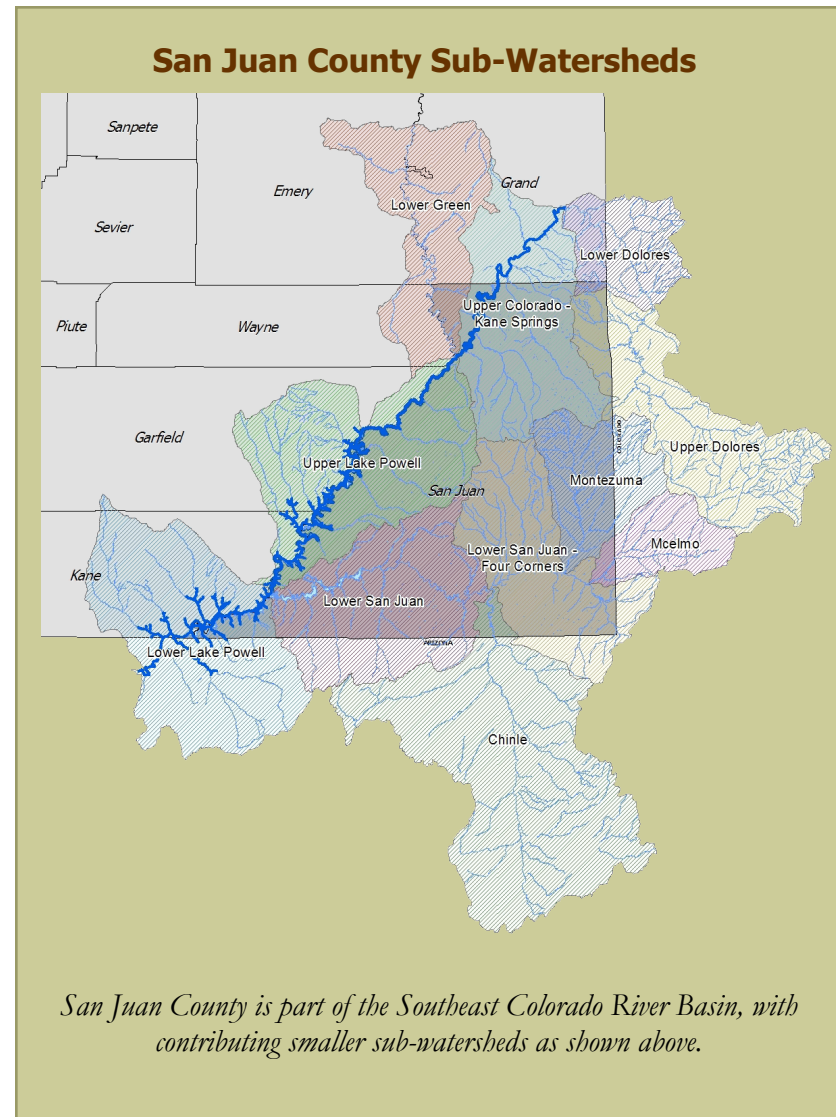
The Colorado River, San Juan River and Lake Powell are the largest bodies of surface water in San Juan County. They are fed by springs, storm runoff, and snowmelt from the surrounding mountains and foothills, and by ground water discharge. Lake Powell and numerous smaller reservoirs in the watershed provide for irrigation water, power generation, recreation, stock water, and flood control. Water for domestic use in towns is supplied mainly from mountain runoff and storage, with a small portion coming from wells.

### Water Quantity and Storage

The total water supply comes from precipitation, mostly in the higher elevations. Up to 90 percent of the precipitation in the upper watersheds is consumed by native vegetation and evaporation. This need must be met before there is surface water runoff or infiltration to the groundwater aquifers that feed springs and provide groundwater inflow. Because of this relationship, a small change in precipitation can cause a large change in water yield. Water has been and still is a scarce resource in this area.

Reservoirs and lakes in the county contain approximately 20,000 acre-feet of water. Recapture Reservoir and Lloyd's Lake make up the majority of this total. Nearly all reservoirs and lakes within the county are used for irrigation, with other uses being municipal and industrial, recreation, and flood control.<sup>8</sup>

The Utah Division of Water Resources Southeast Colorado River Basin Water plan last published in 2004 can be obtained at [www.water.utah.gov/planning/SWP/SEastcol/swp\\_sc02.pdf](http://www.water.utah.gov/planning/SWP/SEastcol/swp_sc02.pdf). Water related land use including GIS information is located at [www.water.utah.gov/planning/landuse/index.htm](http://www.water.utah.gov/planning/landuse/index.htm).



<sup>8</sup> Utah Division of Water Resources

## Water Quality

San Juan County is within the Colorado River Watershed. The Utah Division of Water Quality (UDWQ) has classified the Colorado and San Juan Rivers as impaired for not meeting State standards for dissolved oxygen. Sediment, nutrients, and high water temperatures are also concerns.

Much of the watershed is used by stock and wildlife. Livestock and wildlife in direct contact with streams can contribute to stream bank erosion and increase nutrients. Waste, litter, and toxins from recreational activity near reservoirs also contribute to a slight decrease in water quality in San Juan County.<sup>9</sup>

The UDWQ regularly conducts monitoring of surface waters to assess water quality. An Integrated Report, [www.waterquality.utah.gov/documents/pdf](http://www.waterquality.utah.gov/documents/pdf), is provided to EPA and the public to report assessments results and account for the State's progress in addressing TMDL requirements.

## Irrigation Water

The primary use of San Juan County's water is irrigation. There is a shortage of water for much of the irrigated cropland that exists, especially during the late part of the growing season. The San Juan River tributaries are the main sources of water for irrigation. Irrigation companies service approximately 4,000 acres with three companies accounting for the majority of the water diverted from the rivers. Irrigation water development is becoming prohibitive because of the lack of available water and the large cost involved.<sup>8</sup>

### San Juan County Irrigation & Water Companies

Blanding Irrigation Company  
Blue Mountain Irrigation Company  
Bluff Irrigation Company  
Bluff Pipeline Company  
Carlisle Water Company  
Indian Creek Irrigation Company  
La Sal Irrigation Company  
Pioneer Ditch Company  
Pioneer Irrigation  
Verdue Irrigation Company

<sup>9</sup> Utah Division of Water Quality



Photo Courtesy of San Juan County Economic Development

*Mill Creek*



Photo Courtesy of NRCS

*Recapture Reservoir*

# General Resource Observations

## AIR AND CLIMATE

### Air Quality

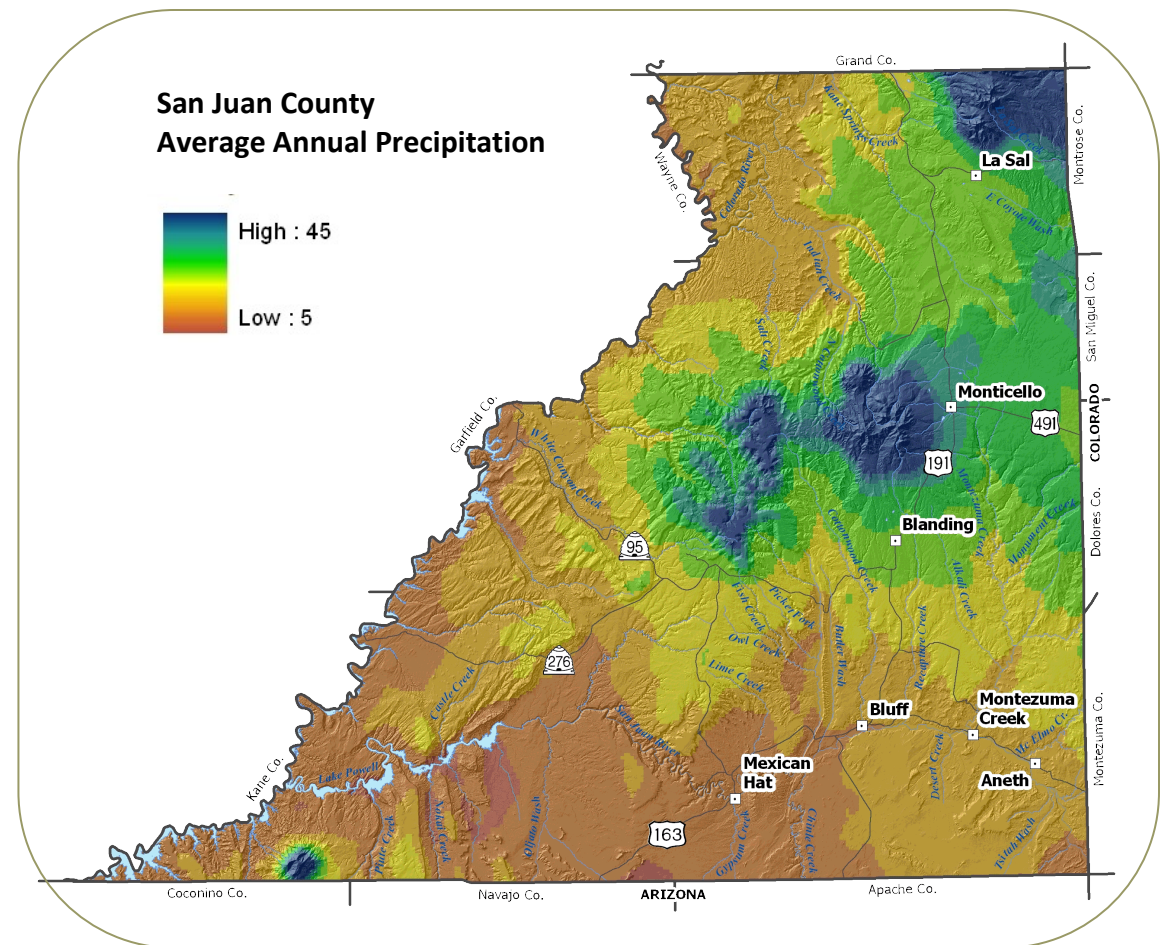
San Juan County air quality is generally very good with minimal negative auto or industrial emissions. Occasionally, spring winds and resulting wind erosion increases particulates to unacceptable levels. Air quality may also be slightly decreased during wildland fires. The county has very few confined animal feeding operations and limited complaints of odors. In the winter months, temperature inversions can cause air quality issues for short periods of time. Because of its national parks, San Juan County is designated as a Class 1 air quality area under 40 CFR Section 51.307 of the Clean Air Act, and is also impacted by the proposed wilderness acres. This classification is meant to protect visual vistas from air quality impacts.<sup>10</sup>

### Climate

In San Juan County, summers are hot, especially at the lower elevations, and winters are cold. Precipitation is normally light at the lower elevations throughout the year. At the higher elevations, precipitation is much greater and snow accumulates to considerable depths. In winter, the average temperature is 30 degrees F and the average daily minimum temperature is 19 degrees. In summer, the average temperature is 70 degrees and the average daily maximum temperature is 87 degrees.

Total average annual precipitation is about twelve inches. Of this, about five inches, or forty percent, usually falls in April through September. The growing season for most crops falls within this period. The average seasonal snowfall is about forty-two inches. The average relative humidity in mid-afternoon is about thirty-five percent. The prevailing wind is from the southwest.<sup>2</sup>

<sup>10</sup> Don Andrews, Natural Resources Conservation Service  
<sup>2</sup> Soil Survey of San Juan County, Utah, Central Part



### NRCS Snow Survey and SCAN Programs

The NRCS Snow Survey Program provides mountain snow pack data and stream flow forecasts for the western United States. Common applications of snow survey products include water supply management, flood control, climate modeling, recreation, and conservation planning. NRCS SNOTEL (SNOWpack TELemetry) sites monitor mountain snowpack and climate to forecast water supplies. San Juan County has one SNOTEL site, located at Camp Jackson at 8,968 feet.

Timing and amount of snow pack, along with temperature fluctuations throughout the spring and summer months, impact the amount of water available for irrigation throughout the growing season. The Utah Snow Survey provides valuable data that is used to help manage water usage to maximize the water that is available. During dry years, it becomes very challenging to provide adequate water to landowners. As a result, it is common to have inadequate water resources available to sufficiently supply the land with irrigation needs for maximum crop growth.

The amount of moisture within the soil profile is an important factor in determining the amount of forage and water runoff that will occur during a given season. The NRCS Soil Climate Analysis Network (SCAN) sites monitor soil moisture and assess drought risk. San Juan County has four sites located within its boundaries: 1) West Summit, 2) Eastland, 3) Alkali Mesa, and 4) McCracken Mesa. The SCAN sites provide valuable information relating to available soil moisture.

For additional information contact the Natural Resources Conservation Service.

Information about the Utah Snow Survey Program is located at <http://www.ut.nrcs.usda.gov/snow>



Photo courtesy of Joe Dupont

*A panoramic view from Highway 191 of the Abajo Mountains, shortly out of Monticello, Utah. The Abajo Mountains store much of the water used for irrigation and culinary use for Monticello and Blanding.*

# General Resource Observations

## PLANTS

### Crops and Pasture

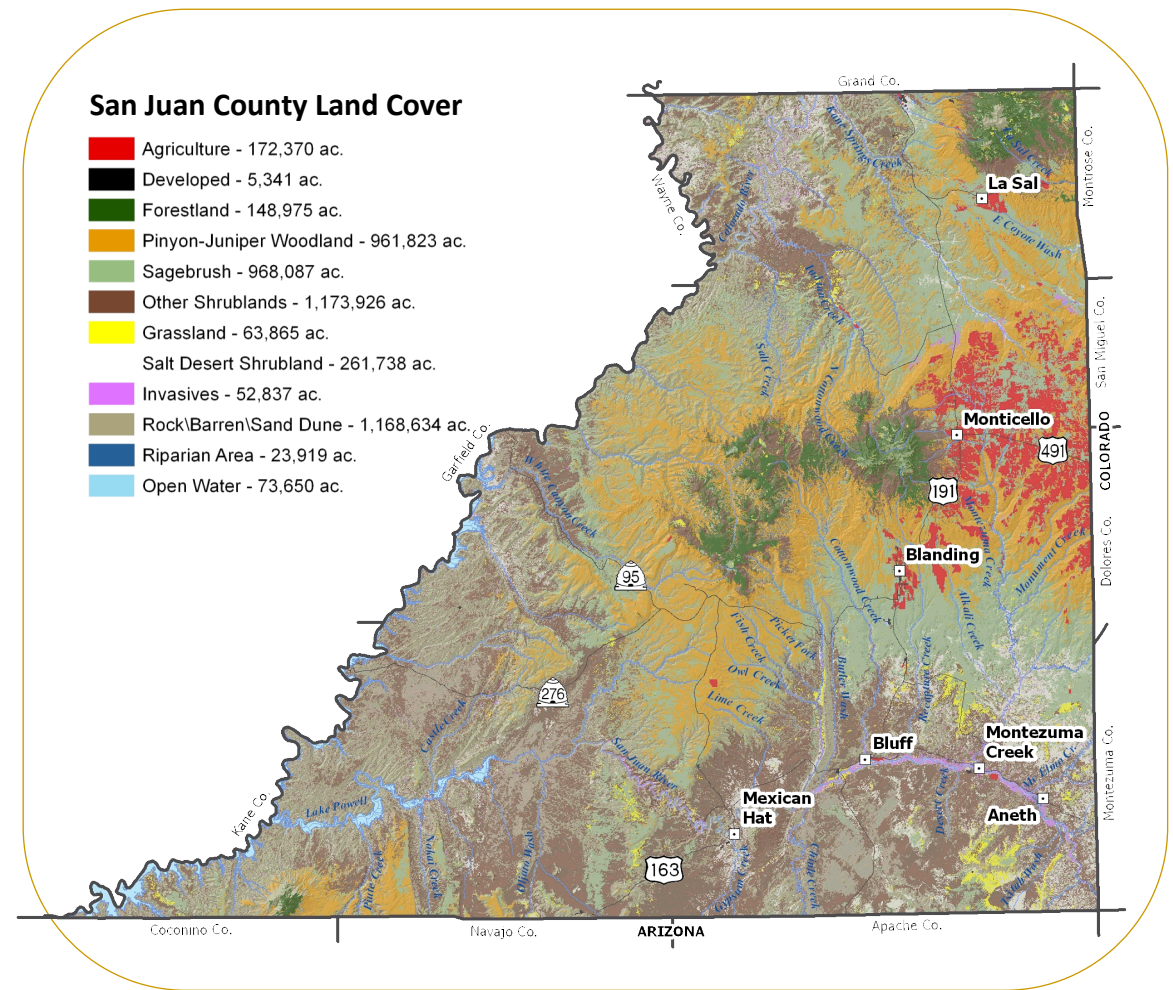
Irrigated crop and pasture lands make up only a small portion of San Juan County, with 120,645 acres of land being irrigated located near Blanding and Monticello. Main crops of irrigated land are alfalfa and other harvestable forage. Producers typically get two to three cuttings of alfalfa each year. Organic crops including safflower, sunflower, and wheat are produced on 43,074 acres, and more land is currently being converted into organic production.

Top crops grown in the area include wheat, grass and alfalfa hay, safflower, sunflower seeds, and beans. San Juan County is the top county in the state for production and sale of beans and sunflower seeds, and is ranked fifth in the production of wheat.<sup>11</sup>

Dryland farming is a major method of crop production in the county. Low precipitation and a short growing season are the main factors limiting the production of non-irrigated crops. Wheat and safflower are the principle non-irrigated crops. Dry farm areas follow a summer fallow cropping practice and are tilled every other year to conserve moisture.

### Rangeland

Rangeland is an important part of the agricultural economy in San Juan County. Grazing allotments allow permittees to manage their livestock and protect the range. Rangeland in the desert areas consists of grasses and sedges including cheatgrass, yucca, fescue, wheatgrass, and blue grass. As elevation increases, the range turns to herbs and shrubs including sagebrush, rabbitbrush, greasewood, and Mormon Tea. The upper mountain ranges consist of mountain brush such as woodrose, Mt. Mahogany, chokecherry and squawbrush.<sup>12</sup>



<sup>11</sup> 2007 Census of Agriculture

<sup>12</sup> Dixie, Fishlake & Manti-La Sal National Forests



## Forestland and Woodland

Forest stands in San Juan County are largely composed of Quaking aspen, Douglas-fir, Engelmann spruce, Blue spruce, Subalpine fir, and Ponderosa pine. The combinations of different forest types and exposures provide for diverse wildlife habitat. At lower elevations, woodland tree species include Gamble oak, mahogany, Pinyon pine, and juniper. Although there are relatively low levels (compared to other areas of the state) of bark beetle populations in this area of Utah, annual aerial surveys indicate that they are spreading. The high density of many forest stands may increase the susceptibility of trees to future beetle infestations.

Currently, aspen stands are declining due to lack of disturbance, including the exclusion of natural, low-intensity wildfire, and are being replaced by shade-tolerant conifers. Aspen provides biological diversity and numerous resource benefits including wildlife habitat, forage, water retention, wood resources, and scenic beauty.<sup>13</sup>



Photo Courtesy of Utah Division of FFSL

*Conifer encroachment of aspens in the La Sal Mountains.*

<sup>13</sup> Natalie Conlin, Utah Division of Forestry, Fire and State Lands

## Utah Noxious Weed List

The following weeds are officially designated and published as noxious for the State of Utah, as per the authority vested in the Commissioner of Agriculture and Food under Section 4-17-3, Utah Noxious Weed Act:

- Bermudagrass\* (*Cynodon dactylon*)
- Black henbane (*Hyoscyamus niger*)
- Broad-leaved peppergrass (*Lepidium latifolium*)
- Canada thistle (*Cirsium arvense*)
- Dalmation toadflax (*Linaria dalmatica*)
- Diffuse knapweed (*Centaurea diffusa*)
- Dyers woad (*Isatis tinctoria*)
- Field bindweed (Wild morning-glory) (*Convolvulus arvensis*)
- Hoary cress (*Cardaria drabe*)
- Houndstounge (*Cynoglossum officianale*)
- Leafy spurge (*Euphorbia esula*)
- Medusahead (*Taeniatherum caput-medusae*)
- Musk thistle (*Carduus mutans*)
- Ox-Eye daisy (*Chrysanthemum leucanthemum*)
- Perennial sorghum (*Sorghum halepense* & *Sorghum almum*)
- Poison hemlock (*Conium maculatum*)
- Purple loosestrife (*Lythrum salicaria*)
- Quackgrass (*Agropyron repens*)
- Russian knapweed (*Centaurea repens*)
- Saltcedar (*Tamarix ramosissima*)
- Scotch thistle (*Onopordum acanthium*)
- Spotted knapweed (*Centaurea maculosa*)
- Squarrose knapweed (*Centaurea squarrosa*)
- St. Johnswort (*Hypericum perforatum*)
- Sulfur cinquefoil (*Potentilla recta*)
- Yellow starthistle (*Centaurea solstitialis*)

### Additional Noxious Weeds Listed by San Juan County:

- Buffalobur
- Camelthorn
- Russian olive
- Whoreled milkweed

Utah Department of Agriculture and Food, Utah Noxious Weed List, October 2010.  
[ag.utah.gov/divisions/plant/noxious/documents/noxUtah.pdf](http://ag.utah.gov/divisions/plant/noxious/documents/noxUtah.pdf)

# General Resource Observations

## ANIMALS

### Livestock

The top livestock inventory items in San Juan County are cattle and calves, sheep and lambs, goats, horses and ponies. San Juan County has approximately 14,085 cattle and calves, 5,746 sheep, 2,578 goats, 2,116 horses and ponies, 351 poultry, and 139 hogs and pigs. The sheep produce about 31,477 pounds of wool each year. Livestock is an essential part of the county's economy. Livestock sales average close to \$5,909,000 each year.<sup>11</sup> According to the 2009 Rangeland Resources of Utah, beef cow numbers in San Juan County are declining, and experts believe the decline is due to the small amount of private land in the county, which has a direct affect on how many cattle can be supported in the area.<sup>14</sup>

### Endangered and At-Risk Species

The Utah Division of Wildlife Resources maintains information on Utah plants and animals classified as at-risk. The state's objective is to prevent at-risk species from being listed by the federal U.S. Fish and Wildlife Service as Threatened, Endangered, or Candidate Species under the Endangered Species Act.

San Juan County's Federally Listed Threatened (T), Endangered (E), and Candidate (C) Species	
Common Name	Status
Navajo Sedge	T
Humpback Chub	E
Bonytail	E
Colorado Pikeminnow	E
Razorback Sucker	E
Greater Sage-grouse	C
Yellow-billed Cuckoo	C
Mexican Spotted Owl	T
Southwestern Willow Flycatcher	E
Black-footed Ferret	E Extirpated
Gray Wolf	E

Utah Division of Wildlife Resources, *County Lists of Utah's Federally Listed Threatened(T), Endangered(E), and Candidate© Species*. November 2010.

<sup>11</sup> 2007 Census of Agriculture  
<sup>14</sup> Rangeland Resources of Utah

### At-Risk Species

Included on Utah's State Listed Conservation Species Agreement with the U.S. Fish and Wildlife Service and Species of Concern in San Juan County:

- **Allen's Big-Eared Bat**
- **American White Pelican**
- **Arizona Toad**
- **Bald Eagle**
- **Big Free-Tailed Bat**
- **Bluehead Sucker\***
- **Bobolink**
- **Burrowing Owl**
- **Common Chuckwalla**
- **Desert Night Lizard**
- **Ferruginous Hawk**
- **Flannelmouth Sucker\***
- **Fringed Myotis**
- **Gunnison Sage-grouse\***
- **Gunnison's Prairie-Dog**
- **Kit Fox**
- **Lewis's Woodpecker**
- **Long-Billed Curlew**
- **Mogollon Vole**
- **Northern Goshawk\***
- **Roundtail Chub\***
- **Short-Eared Owl**
- **Silky Pocket Mouse**
- **Smooth Greensnake**
- **Spotted Bat**
- **Three-Toed Woodpecker**

\*Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing. For more information visit the Utah Division of Wildlife Resources website: [dwr.cdc.nr.utah.gov/ucdc/](http://dwr.cdc.nr.utah.gov/ucdc/)



Photo courtesy of UDR

### Short-Eared Owl

The short-eared owl, *Asio flammeus*, is a medium-sized owl that frequently flies during daylight, especially at dusk and dawn, as it forages for rodents. It is nomadic, often choosing a new breeding site each year, depending on local rodent densities. This owl nests beginning in April on the ground in a small depression excavated by the female. There is some concern that the short-eared owl populations are declining.<sup>15</sup>



Photo courtesy of UDR

### Desert Night Lizard

The desert night lizard, *Xantusia vigilis*, is found in the southwestern United States and in Baja California. In Utah, the desert night lizard occurs only in a few small areas of the southern portion of the state. The lizard is rarely seen, and was once thought to be rare throughout its range. It was later discovered, however, that this lizard is extremely secretive. Females do not lay eggs, but give birth to live young (usually one to three young) in late summer or early fall.<sup>15</sup>

## Aquatic Life

San Juan County reservoirs are home to a number of cold-water fish including brook trout, rainbow trout, brown trout, bullheads, and arctic graylings.<sup>9</sup>

## Game

San Juan County is rich in big game. Annually, over 4000 hunters harvest about 1,500 Mule deer on the Abajo Mountains and the La Sal Mountains. Private lands in the eastern and northern parts of the county play an important role in providing habitat for a significant portion of the Abajo and La Sal Mountains deer herds. Approximately 500 elk are harvested by over 1,500 hunters in the San Juan and La Sal Mountain units in San Juan County each year. The San Juan unit is nationally renowned for the trophy-quality bull elk that are hunted there. Management of the elk herd on private lands in the county is both complex and controversial in providing economic benefits to some landowners and causing crop damage problems for others.

San Juan County is also home to three native populations of desert bighorn sheep. There are currently an estimated 300 bighorns inhabiting the remote areas of San Juan County. San Juan County has one small pronghorn herd of approximately 150 animals in the Hatch Point area. Large predators, namely cougar and bear, are abundant in San Juan County. The county is one of the most popular areas in Utah to hunt these animals.

Upland game species found in the county include wild turkeys, chukars, mourning doves and cottontail rabbits.<sup>16</sup>

<sup>9</sup> Utah Division of Water Quality

<sup>15</sup> Utah Conservation Data Center

<sup>16</sup> Guy Wallace, Utah Division of Wildlife Resources

## HUMANS: Social and Economic Considerations

### Population

San Juan County's population has gradually increased over the last fifteen years and is projected to continue to increase into 2015. Over half the population of San Juan County is of the Native American ethnic group. This provides a unique culture and history for San Juan County.<sup>17</sup>

### Economy

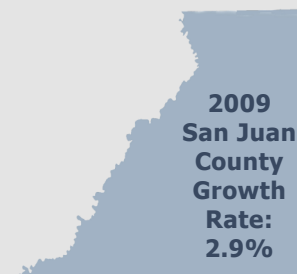
Agriculture has formed the basis of San Juan County's economy for many years. Oil, gas and mining spurred economic booms, but this sector has decreased substantially over the last two decades, particularly with the closing of oil wells and uranium mines. Timber and mineral operations have also declined and are no longer being realized to their fullest potential. Most of the extractive industries are dependent on federal, state, local and tribal politics, which have slowed many plans in recent years.

While neighboring Grand County shifted to a tourism economy, San Juan County remained reliant on agriculture and other services. While residents would like to see agriculture, grazing, and timber preserved, the services, government, and non-farm proprietor sectors are now projected to create the most jobs in coming decades.

Many residents see tourism as the most promising economic resource. Much of the growth in government jobs has been attributed to education and social service programs addressing the poverty and education gap in the region. Economic development is a priority of all county residents.<sup>18</sup>



### San Juan County Population Data



Area Name	San Juan
Period Year	2009
Population	15,643
Births	196
Deaths	83
Natural Increase	113
Net Migration	324
Annual Change	437
Annual Rate of Change	2.9%

Source: Utah Population Estimates Committee  
<http://www.governor.state.ut.us/dea/UPEC.html>

<sup>17</sup> Utah Department of Workforce Services

<sup>18</sup> [www.southeastutah.org](http://www.southeastutah.org)

## Labor Market

San Juan County has had the highest annual unemployment rate in the state for the last five years. In 2007, the unemployment rate was at the comparatively tolerable level of 5.6 percent. By 2009, however, the rate nearly doubled, rising to 10.7 percent. The 4.1 percentage-point increase from 6.6 percent in 2008 to 10.7 percent in 2009 was the third highest increase statewide. Despite the county's record of high unemployment, San Juan County has the fifth-smallest percentage decline in employment out of 28 counties in Utah that lost jobs during 2009.<sup>17</sup>

## Recreation

San Juan County is commonly referred to as Canyon Country and is located in the four corners region. As such it has a large variety of recreational opportunities. Many National Parks and Monuments including Monument Valley, Canyonlands, Arches, Natural Bridges, Hovenweep, and Lake Powell. Lake Powell, located in Glen Canyon National Recreation Area, is a major destination for boating, skiing, kayaking and fishing. The 186-mile long lake has over 2,000 miles of shoreline and beautiful red-rock scenery. Recreationists enjoy visiting Rainbow Bridge and the Glen Canyon Dam.<sup>18</sup>

Also located in San Juan County are the Edge of the Cedars State Park and Museum and the Goosenecks of the San Juan River State Park. The area has a strong and bountiful cultural and natural history that is evident in many areas. People can take advantage of the vast opportunities found in San Juan by enjoying a river rafting trip, jeep tours, hiking, biking, camping, 4-wheeling and much more.<sup>19</sup>

Photos courtesy of San Juan County Economic Development



*San Juan County provides numerous recreational activities, including ATV riding and river rafting.*

<sup>19</sup> <http://www.utah.com/lakepowell/>

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## Map & GIS Data Sources

San Juan County Land Ownership: Land ownership status and areas of responsibility for the State of Utah. The Utah School and Institutional Trust Lands Administration (SITLA) and the Bureau of Land Management revise this data regularly to reflect changes in ownership. Available for download from the Utah Automated Geographic Reference Center at: <http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=LandOwnership>

Soil Erosion T Factor Erosion: T-factor derived from the following SSURGO soil surveys: UT633 – Canyonlands Area, Utah – Parts of Grand and San Juan Counties, UT638 – San Juan County, Utah - Central Part, UT639 – San Juan Area, Utah, and UT643 – San Juan County, Utah – Navajo Indian Reservation using Soil Data Viewer, a tool created by USDA Natural Resources Conservation Service as an extension to ArcMap that allows users to create soil-based thematic maps. SSURGO Soil Surveys are available for download from the NRCS Soil Data Mart: <http://soildatamart.nrcs.usda.gov/>

San Juan County Lakes, Rivers & Canals: A subset of the National Hydrography Dataset (NHD). The NHD was developed by U.S. Geological Survey (USGS) in cooperation with U.S. Environmental Protection Agency, USDA Forest Service, and other Federal, State, and local partners. Available for download from the Utah Automated Geographic Reference Center at: <http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=StreamsNHDHighRes>

San Juan County Gunnison Sage Grouse Habitat: Winter and brooding use areas in San Juan County as determined by Utah Division of Wildlife Resources field biologists in 1999. Available for download from the Utah Automated Geographic Reference Center at: [http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=Habitat\\_SageGrouseBrood](http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=Habitat_SageGrouseBrood) and [http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=Habitat\\_SageGrouseWinter](http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=Habitat_SageGrouseWinter)

San Juan County Energy Resources: The following data is available for download from the Utah Automated Geographic Reference Center at: <http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc>. Coal Deposit Areas, Gas Fields, Oil Fields, and Uranium Mills – Utah Geological Survey (UGS), a division of the Utah Department of Natural Resources. Tar Sands – Utah Mineral Occurrence System by Utah Geological Survey (UGS), a division of the Utah Department of Natural Resources. Solar Zones and Wind Zones– National Renewable Energy Laboratory (NREL) for the Utah Renewable Energy Zones Task Force Phase I Report: Renewable Energy Zone Identification.

Important Farmland Classification: Prime and Statewide Important Farmland derived from the following SSURGO soil surveys: UT633 – Canyonlands Area, Utah – Parts of Grand and San Juan Counties, UT638 – San Juan County, Utah - Central Part, UT639 – San Juan Area, Utah, and UT643 – San Juan County, Utah – Navajo Indian Reservation using Soil Data Viewer, a tool created by USDA Natural Resources Conservation Service as an extension to ArcMap that allows users to create soil-based thematic maps. SSURGO Soil Surveys are available for download from the NRCS Soil Data Mart: <http://soildatamart.nrcs.usda.gov/>

San Juan County Soils: General soil properties derived from the following SSURGO soil surveys: UT633 – Canyonlands Area, Utah – Parts of Grand and San Juan Counties, UT638 – San Juan County, Utah - Central Part, UT639 – San Juan Area, Utah, and UT643 – San Juan County, Utah – Navajo Indian Reservation using Soil Data Viewer, a tool created by USDA Natural Resources Conservation Service as an extension to ArcMap that allows users to create soil-based thematic maps. SSURGO Soil Surveys are available for download from the NRCS Soil Data Mart: <http://soildatamart.nrcs.usda.gov/>

San Juan County Sub-Watersheds: A subset of the National Hydrography Dataset (NHD). The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about naturally occurring and constructed bodies of water, paths through which water flows, and related entities. The NHD was developed by U.S. Geological Survey (USGS) in cooperation with U.S. Environmental Protection Agency, USDA Forest Service, and other Federal, State, and local partners. Available for download from the USGS National Map website at: <http://nationalmap.gov/index.html>

San Juan County Average Annual Precipitation: This data set represents derived average annual precipitation according to a model using point precipitation and elevation data for the time period 1971 – 2000. Produced by U.S. Department of Agriculture Natural Resources Conservation Service – National Cartography and Geospatial Center.

San Juan County Land Cover: This data set represents natural and semi-natural vegetation in the state of Utah. Produced by RS/GIS Laboratory, College of Natural Resources, Utah State University for the USGS National Gap Analysis Program. Published 9/15/2004.

### Other

Roads: This data set represents street centerline data for the State of Utah as compiled by the Utah Automated Geographic Reference Center from data contributed by local, county, state, federal and tribal governments. Available for download from the Utah Automated Geographic Reference Center at: <http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=Roads>

County Boundaries: This data set represents county boundaries in Utah at 1:24,000 scale. Last updated 8/18/2009. Available for download from the Utah Automated Geographic Reference Center at: <http://gis.utah.gov/sgid-vector-download/utah-sgid-vector-gis-data-layer-download-index?fc=Counties>