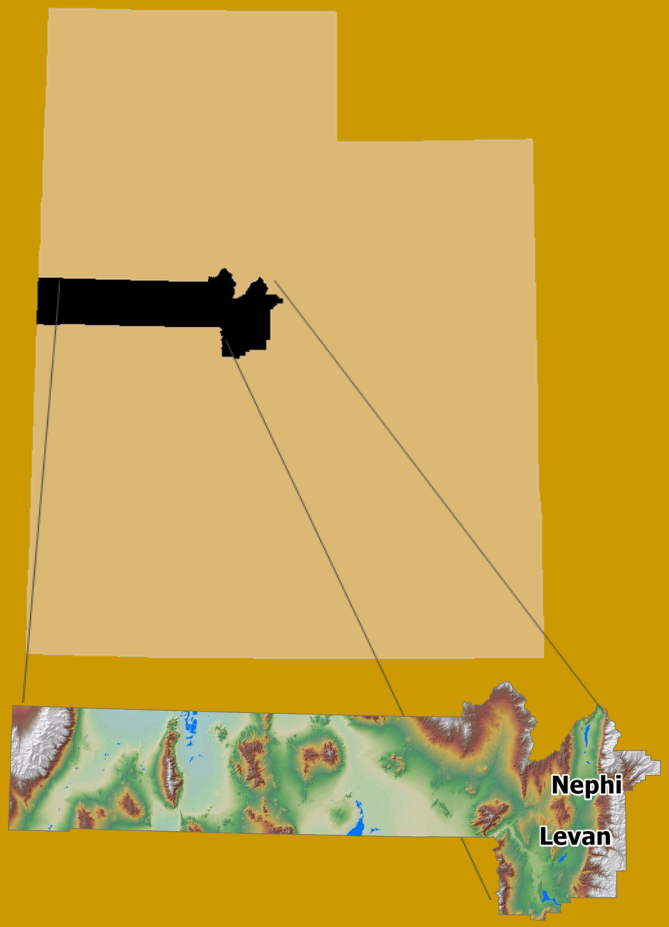
Juab County Resource Assessment

MARCH 2013

Conserving Natural Resources For Our Future

JUAB CONSERVATION DISTRICT



UACD
Utah Association of Conservation Districts

UDAF
Utah Department of Agriculture and Food

USDA NRCS Natural Resources Conservation Service

Acknowledgments

Juab Conservation District (Juab County)

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 Conservation Districts Zone 4
Utah Association of Conservation Districts
Utah Department of Agriculture and Food
Utah Department of Environmental Quality
Utah Department of Natural Resources
Utah School and Institutional Trust Lands Administration
Utah State University Extension
Utah Weed Supervisor Association

Utah Partners for Conservation & Development (UPCD)

State Agencies and Organizations:
Utah Association of Conservation Districts
Utah Department of Agriculture and Food
Utah Department of Community and Culture
Utah Department of Environmental Quality
Utah Department of Natural Resources
Utah Resource Conservation & Development Councils
Utah School and Institutional Trust Lands Administration
Utah State University Cooperative Extension Service
Utah Energy Office

Federal Agencies:
U.S. Department of Interior
Bureau of Land Management
U.S. Fish and Wildlife Service
Bureau of Reclamation
U.S. Department of Agriculture
U.S. Forest Service
Natural Resources Conservation Service
Agriculture Research Service
Farm Service Agency

Other

State Historical Preservation Office
Governor's Office of Planning and Budget
Juab County Commission

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Many thanks to all those that have made comments and suggestions for this project.

Table of Contents

Juab County Resource Assessment: Executive Summary

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Why a Resource Assessment?

The Juab 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 Juab 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:

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Natural Resource Priorities and Concerns

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

1. **Improve water quality, quantity, and irrigation efficiency.**
2. **Improve rangelands.**
3. **Control and/or eradicate invasive plants and weeds.**
4. **Reduce the erosion of soil by wind and/or water.**
5. **Adequate marketing for agricultural products.**

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.

Introduction

The Conservation District 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 has 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 38 conservation districts.

Conservation Progress

Since the organization of the Juab Conservation District in 1944, great strides have been made toward increasing and sustaining natural resources in Juab County. The District provides assistance to farmers in soil and water conservation and improved land use.

Public Outreach

In 2008, the Juab Conservation District conducted a survey to find out how others viewed the county's natural resources and what conservation issues were most pressing. Respondents indicated that the issues of highest concern were: 1) improved irrigation water management, 2) improved range and grazing lands, 3) controlled invasive species and noxious weeds, 4) reduced soil erosion by wind and water, and 5) increased agricultural sustainability.

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.

A great "roller" moves across the land during the Dust Bowl.

Mt. Nebo. *Photo by Ralph Walbeck.*

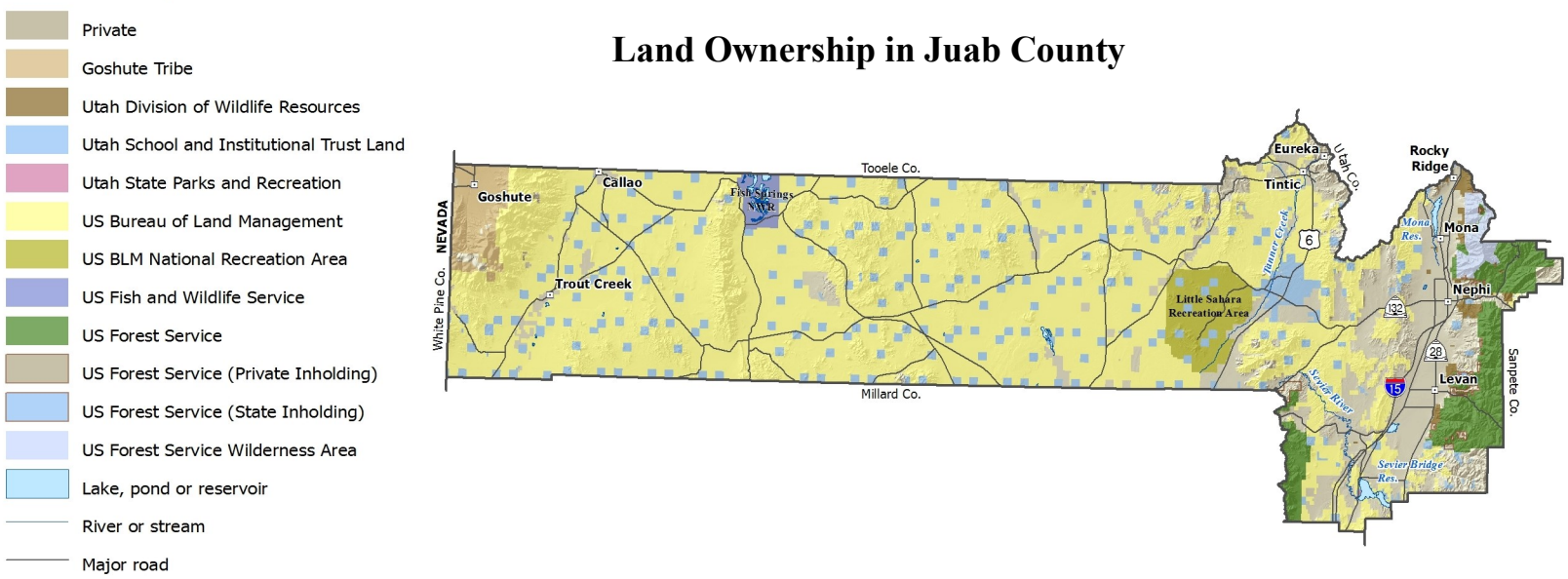
Juab County Overview

Background and Landownership

Juab County was formed in 1852, including portions of what is now Nevada. It was named after a Native American word for "flat or level plain". The size of the county was reduced in 1854 and 1856, along with various other changes through the years, until the current borders were set. The first real settlement came in 1851, when Mormon pioneers settled Nephi. They relied mainly on agriculture for their livelihoods. In 1869, silver, gold, copper, and other precious metals were discovered in the Tintic region. Many mining towns, such as Diamond, Silver City, and Eureka were formed during this era. By 1899, Juab County was considered to be one of the richest mining districts in the entire nation.

Juab County is located in west-central Utah and extends westward from the mountains of the Uintah National Forest, near the center of the state, to the arid desert lands on the Nevada border. At its narrowest point, Juab County is 125 miles long and 25 miles wide. Juab County covers 2,183,681 acres (3,412 square miles). Of that, 1,569,966 acres are federally owned, with the BLM covering 1,442,917 acres, the Forest Service covering 109,917 acres, and the U.S. Fish and Wildlife covering the remaining 17,992 acres. State lands cover 178,526 acres, with 39,038 acres belonging to the Goshute Reservation. There are approximately 382,144 acres of private land, of which 9,819 acres are in road and rail road right-of-ways. The incorporated cities of Nephi (1962.2 acres), Mona (763.2 acres), Eureka (550.3 acres), and Levan (484.3 acres) comprise the noted acres.

The Juab Conservation District is located in Juab County and part of Sanpete County. It covers practically all of Juab County, from the Nevada border to the Wasatch Mountains. Also included are those parts of Sanpete County, 19,125 acres, which drain westward into Juab County. The portion of Juab County, 1, 919 acres, that drains east into Sanpete County is not included in the district.



Juab County

Left to right, clockwise: Farm Field Day (2 photos), Windbreak project, *all photos by David Pace;* AFO project*, photo by Ralph Walbeck* .

Water Quantity, Quality & Irrigation Efficiency

Challenges

Juab County has few live streams, natural lakes, or reservoirs. Spring run-off, precipitation, and wells are the main sources of water. Much of the irrigated land is dependent wholly, or at least partially, on direct flows. Watersheds are steep and short. Runoff generally starts in April, providing adequate or surplus amounts until the middle of June when the supply diminishes rapidly causing a severe water shortage. Many of the irrigation companies still have antique distributions systems that are very inefficient.

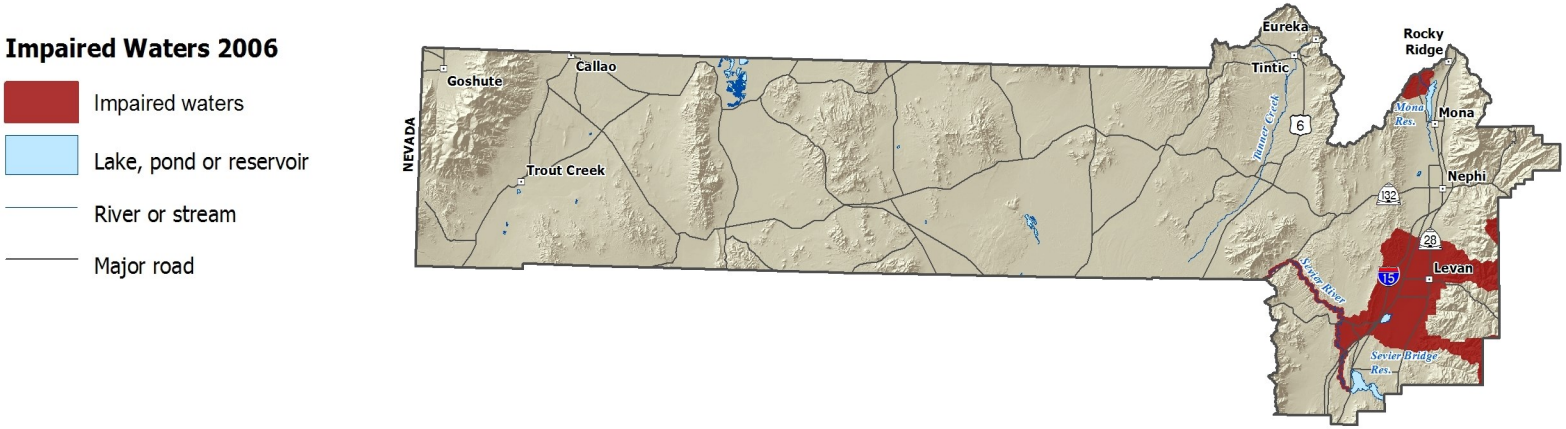
Resource Management, Needed Actions & and Projects

- Any new projects that will increase, conserve, or protect water are the highest priority of the Juab Conservation District.
- Encourage farmers to utilize their water more efficiently by installing sprinkler systems where feasible and installing pipeline laterals where other irrigation systems are most feasible.
- Federal, state, and local programs to assist in these projects are a crucial and much needed factor.

Outreach

- Continue to enlist the assistance of the Utah State University Extension Service, federal agencies, the conservation districts, and others in conducting meetings with farmers and irrigation companies to gain a better understanding of irrigation water management principles and their use.

Impaired Waters in Juab County



Improve Grazing & Rangelands

The rangelands of the districts are grazed by cattle, sheep, deer, elk, and other wildlife species. Some domestic livestock graze on rangeland throughout the year. Spring and summer grazing occurs in the uplands and mountains. Rangeland includes native plant communities and those seeded to native or introduced species, or naturalized by introduced species, that are ecologically managed using range management principles.

Challenges

- Most of Juab County consists of rangeland; therefore, improving this resource is important just because it is so vast.
- Much of the rangeland is infested with cheat grass, annual mustard, and sagebrush. The higher elevations are covered with pinyon pine and juniper trees. All of these species are invasive and conductive to wild fires and soil erosion.

Resource Management, Needed Actions & Projects

- Brush and invasive species control and the re-seeding of more productive species are needed to improve the districts' rangeland conditions.
- The implementation of watering facilities is needed to improve wildlife habitat and make managed grazing systems possible.
- Mechanical thinning of pinyon-juniper and ponderosa pine for improved eco-system health and fire load reduction.

Outreach

- Attendance by Fishlake National Forest, Manti La Sal National Forest, Uintah Nation Forest, Bureau of Land Management, and others at regular Juab CD meetings for cooperation, coordination, and advocacy purposes.
- Invitations to County Commission and FSA County Committee staff and/or members to attend the districts' meetings as their schedule allows.

Fire rehab. *Photo by David Pace.*

Invasive Plants & Weeds

The control of invasive species is a crucial part of improving the range resource.

Challenges

- Invasive species are increasing and are reducing the amount of forage available for livestock and wildlife.
- Pinyon pine, juniper trees, sagebrush, and knapweeds are invading and degrading rangeland. Noxious weeds degrade irrigated cropland and reduce the value of agricultural commodities.

Resource Management, Needed Actions & Projects

- The control of invasive plants and weeds includes prescribed burns, biological and mechanical methods, and herbicide to prevent wildfire, habitat and agricultural degradation, and unproductive monocultures.

Outreach

- Cooperate and advocate the continued efforts of the Juab County Weed Board, County Commissioners, and Weed Spray Supervisor in controlling invasive species and noxious weeds.
- Cooperate with the local Cooperative Weed Management Area (CWMA) and be an advocate for the area.

Drought affected grazing land in the summer of 2012. *Photo by David Pace.*

Marketing for Agricultural Products

Challenges

- Distance to auctions for livestock.
- Distance to viable market for alfalfa.

Resource Management, Needed Actions & Projects

- The Juab CD encourages the Utah Department of Agriculture and Food and the Utah State University Extension to continue to help market agricultural products.
- Increase the use of video auctions for livestock.
- Promote contacts with reputable hay brokers.

Livestock auction in Utah. *Photo from deseretnews.com.*

Soil Erosion

Challenges

Controlling erosion not only sustains the long-term productivity of the land but also affects the amount of soil, pesticides, fertilizer, and other substances that move into the nation's waters. Water erosion is severe in some of the watersheds of the county, because they are frequently subjected to high-intensity rainstorms that fall on sparsely vegetated slopes. Some of the lower range areas are subject to severe erosion during high intensity storms falling on pinyon-juniper and other range areas that have been denuded by overgrazing or burning without reseeding. There is some erosion in unlined irrigation laterals that run down slopes and also when some of the steeper fields are irrigated by furrows or wild flooding.

Resource Management, Needed Actions & Projects

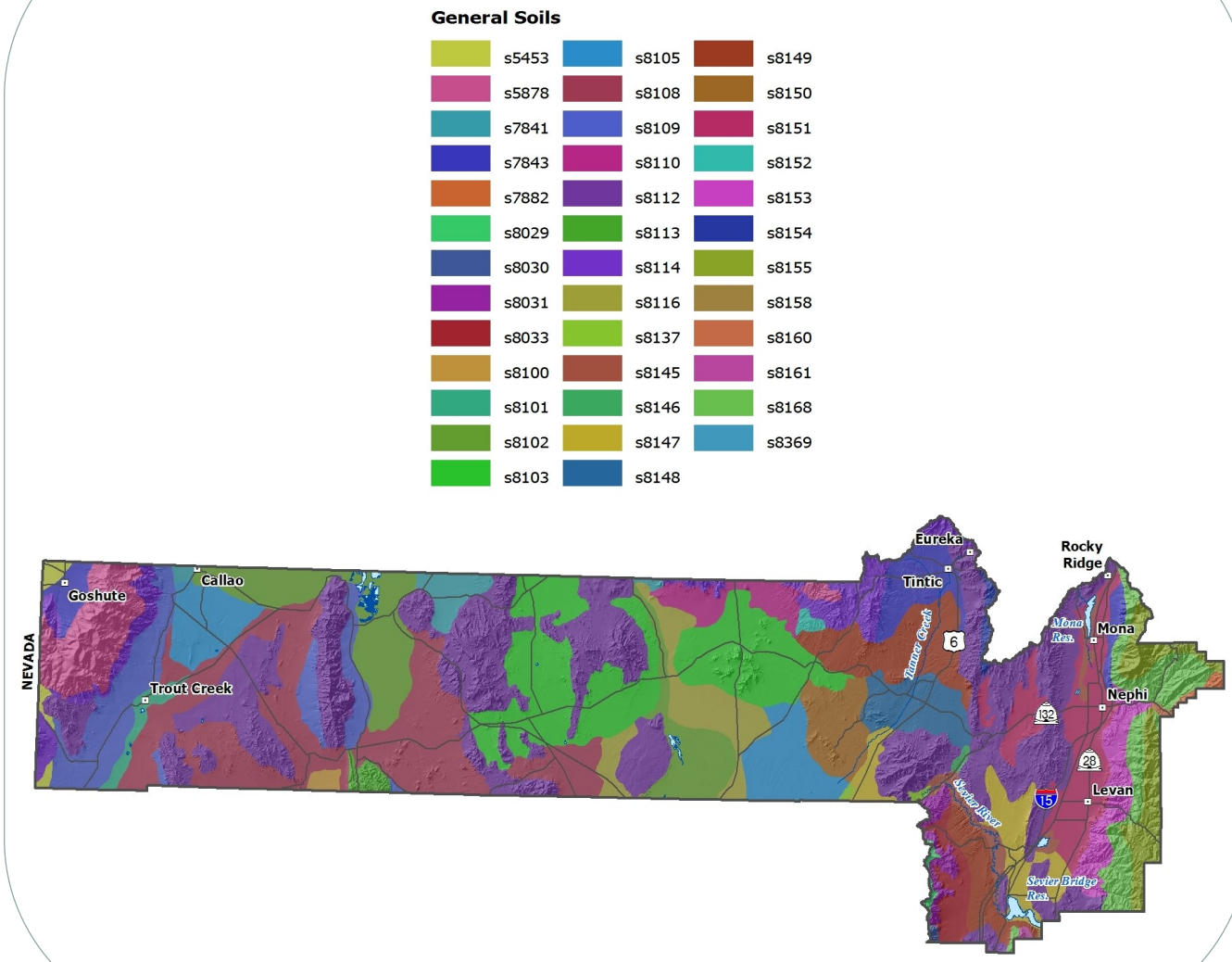
- The implementation of Best Management Practices (BMPs) dealing with irrigation and re-vegetation of rangeland, using ARDL, GIP, EQIP, WHIP, etc., is needed to protect soils from erosion.
- Identify and map existing and potential critical erosion areas and the land use associated with each.
- Provide available assistance to ranchers and others in solving soil erosion problems.
- Encourage rangeland improvements, such as brush control, reseeding, and grazing management.

Outreach

- Continue close working relationship with the Natural Resource Conservation Service and local irrigation companies.

Natural Resource Priorities and Concerns

Soil Classification in Juab County



Soil • Water • Air & Climate • Plants • Animals • Humans

The NRCS conducts resource inventories to help resource managers make land use decisions. These inventories evaluate the soil, water, air, plants, and animals and are discussed below. The Juab Conservation District used these inventories to determine its priority concerns for this assessment and in its long range planning process.

Soil

The soils in Juab County developed mainly from the erosion of igneous and sedimentary rocks. The valleys are composed of alluvium and lake sediments. The soils generally range from very deep and fine textured in the valley bottoms to shallow and course textured on the hills and mountains. Depressional areas in the valley bottoms are generally poorly drained and high in salts. Many areas in the valleys of the eastern portion of the county are used for irrigated and non-irrigated grain, alfalfa, and pasture. The hills and mountains are used for range and wildlife habitat. The central and western portion of the county is used mainly as rangeland for cattle and winter rangeland for sheep.

Information on the soils in Juab County can be obtained from the Web Soil Survey (WSS) located at http://websoilsurvey.nrcs.usda.gov/. The soil survey provides data and information produced by the National Cooperative Soil Survey, a nationwide partnership of federal, regional, state, and local agencies and private entities and institutions. The WSS allows a user to: 1) define an area, 2) view the survey boundaries and soil types overlaid on a photo, 3) explore various interpretations, and 4) print maps and descriptive information.

The soil survey delineates and describes large areas of similar soils. Common uses are evaluating soil suitability for dwellings with basements, landscaping, roads, and septic systems and measuring for vegetative productivity and chemical and physical properties. Using this information, agriculture producers, agencies, counties, and municipalities know the various soil suitabilities and are alerted to soil limitations. This basic resource information is critical when making land-use and management decisions.

When limitations are identified, on-site investigations should be conducted by a soil scientist or soil engineer.

Water

Water Quality

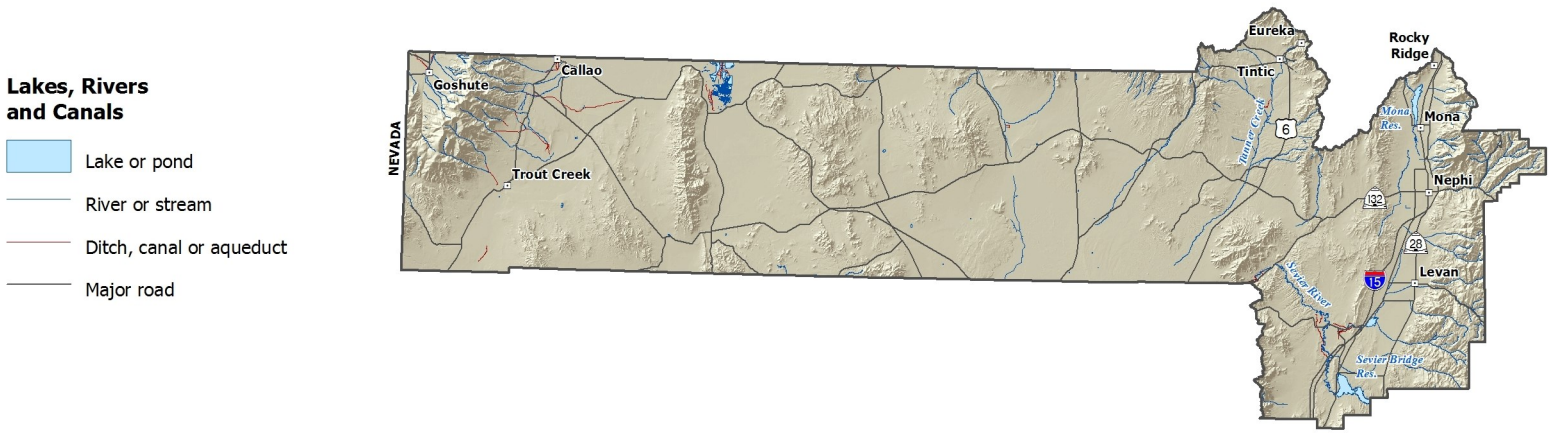
The Total Maximum Dairy Load (TMDL) water pollution determination process has identified sediment and phosphorus as the primary sources of water pollution coming from irrigated lands, rangelands, and stream banks. Best Management Practices used to correct the problem are improved irrigation efficiencies and improved range health.

Water Quantity

The principle stream is the Sevier River, which flows through the southeast part of the county. All of the Sevier River water that reaches Juab County and all of the water stored in the Sevier Bridge Reservoir is owned and used in Millard County. Other streams, which flow out of the mountains in the east and west ends of the district, are small and are used to irrigate farms. Water in the Mona Reservoir, which is fed by springs, wells, and occasionally by high water from the mountain streams, is owned and used in Utah County. Most of the water in the mountain streams is owned by non-profit irrigation companies. The larger of these are the Nephi, Levan, Mona, Callao, North Canyon, and Juab Lake irrigation companies.

Developments in Utah Valley are having an impact on the land use practices in Juab Valley. Land use is being changed from agricultural to residential. The water resources of this valley are tributary to Utah Lake through Mona Reservoir and Currant Creek. Hence, ground-water development and changes in water use practices appear to have an effect on the Utah Lake System, which is fully appropriated.

Water Sources in Juab County



Air & Climate

Air Quality

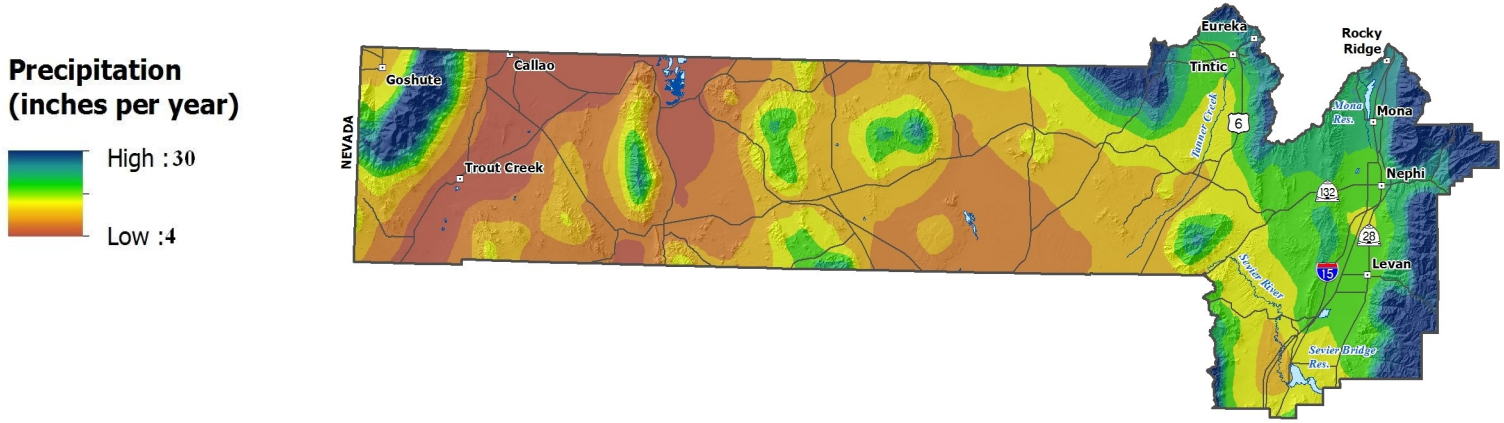
Wildfires leave the soil bare and then wind erosion becomes a serious problem. This leads to dust storms that reduce visibility along Interstate-15 and can potentially closes the freeway. These dust storms also compromise the air quality of communities and cities in Juab, Utah, and Salt Lake Counties. Efforts by federal, state, and local governments and private land owners are needed to reseed areas damaged by the Milford Flat fire of 2007

Climate

The climate in Juab County varies with elevation and location. In general, temperatures are lower and precipitation is higher at the higher elevations. Some low areas, such as Mills, and some desert valleys have very cold winters and are subject to frost any month of the year. In most farming areas, the average frost-free period is 130 to 145 days.

Precipitation varies from a low of about four inches in the west end of the county to around fourteen inches in Nephi and Levan to 25 to 30 inches annually in the higher elevations. Except for June and September, precipitation is fairly evenly distributed throughout the year.

Annual Precipitation in Juab County



NRCS Snow Survey

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. There are a couple of SNOTEL (SNOwpack TE-Lemetry) sites located within Juab County, and although Rees Flat SNOTEL site is located in Sanpete County, it monitors the conditions for the Lower Sevier and Juab County. There is one other SNOTEL site that is located in the valley, and until recently, it was monitored by Utah State University Extension.

Rees Flat SNOTEL site. *Photo by NRCS.*

Plants

Crops and Pasture

Most of the irrigated land in the county is found in the valleys, near streams from the mountains at the east and west ends of the county. The principal irrigated crops are alfalfa hay, corn for silage, and small grains such as wheat, barley, and oats. Most of these crops are fed to livestock kept on farms.

Pasturelands in the county are in poor to fair condition. Species have gone from high value to low value. Compaction has reduced infiltration, increased runoff, and reduced the filtering capacity of these lands.

Rangeland

Rangeland health in the shrub-steppe is declining, which has increased the erosion off rangelands and lowered the productive potential of these lands for livestock and wildlife. Thousands of acres of closed sagebrush stands have lost species diversity. The grazing capacity of all rangelands depends on the amount of annual precipitation received. Invasive species, such as tamarisk, Russian olive, and decadent stands of sagebrush, reduce forage production. Poisonous plants, such as halogeten, loco weed, and larkspur, are a recurring problem.

Land Cover

- Other Shrublands - 482,748 ac.
- Sagebrush - 470,953 ac.
- Salt Desert Shrubland - 427,574 ac.
- Pinyon-Juniper Woodland - 370,991 ac.
- Invasives - 113,469 ac.
- Rock\Barren\Sand Dune - 112,591 ac.
- Agriculture - 77,674 ac.
- Forestland - 68,473 ac.
- Grassland - 23,756 ac.
- Riparian Area - 12,374 ac.
- Developed - 10,493 ac.
- Lake, pond or reservoir
- River or stream
- Major road

Land Cover Distribution in Juab County

Forest and Woodland

Portions of the Uintah National Forest, the Fishlake National Forest, and the Manti La Sal National Forest are all within Juab County.

Juab County's elevation ranges from 4,285 feet at Fish Springs in the west to 12,087 feet at Ibapah Peak in the Deep Creek Range of the west desert near the Nevada border. Mt. Nebo, in the Wasatch Mountain Range, reaches 11,928 feet in east Juab County. The two mountain peaks are jointed by rich green valleys containing fertile farmlands and vast desert lands with acres of free moving sand dunes.

Deep Creek Mountains. *Photo from BLM.*

Blue Flowering Lettuce.
Photo from USU Extension.

Additional noxious weeds declared by Juab County:
Blue Flowing Lettuce

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.

- Bermuda grass (*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*)

Animals

Livestock

Farmers in Juab County are primarily dependent upon beef production for their income. There are several dairies with 100 to 500 dairy cattle in Juab County.

Endangered and At-Risk Species

There are no endangered species located in Juab County, but there are a couple of threatened species: the bald eagle and the yellow-billed cuckoo.

Bald eagle. *Photo from utahwildlifephoto.com.*

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 Juab County:

- **American White Pelican**
- **Bald Eagle**
- **Big Free-Tailed Bat**
- **Black Swift**
- **Bonneville Cutthroat Trout**
- **Brown Bear**
- **Burrowing Owl**
- **Canada Lynx**
- **Greater Sage-Grouse***
- **Kit Fox**
- **Northern Goshawk**
- **Short-Eared Owl**
- **Three-Toed Woodpecker**
- **Utah Prairie Dog**

This list was compiled using known species observations from the Utah Natural Heritage Program within the last 20 years. A comprehensive species list, which is updated quarterly, can be obtained from the Utah Division of Wildlife Resources website at: dwrcdc.nr.utah.gov/ucdc/.

*The greater sage-grouse status as a candidate species is verified and confirmed from U.S. Fish & Wildlife Service News Release *Interior Expands Common-Sense Efforts to Conserve Sage Grouse Habitat in the West*, dated 3/5/10, available at: www.fws.gov/news/NewsReleases/.

Wildlife and Aquatic Life

Hunting is a popular sport in Juab County. Deer are found throughout the area. Elk are hunted in the Wasatch Mountains, and antelope are found in some of the desert valleys. Fox, weasels, skunks, and bobcats are found throughout the county. There are also coyotes in the desert areas and a few mountain lions in the mountainous areas. Rabbits are found everywhere in the county.

Upland game birds, such as pheasants, doves, and chukers, are found near cropland. Goose hunting is popular in wheat fields in Juab Valley. Waterfowl are hunted near the reservoirs and in the marshes.

Fishing in the county is limited. A few ponds and all small streams are stocked with trout. Pike, bass, and bluegill are also managed for sport.

Coyote. *Photo from utahwildlifephotos.com.*

Pheasant. *Photo from utahwildlifephotos.com.*

Local Animal Priorities

- No transplant of wolves.
- Increase coyote and other predator control.
- No more transplants of aquatic species.
- No more transplants of endangered species of any kind.
- Reduce impact of elk on aspen regeneration.
- Increase numbers of mule deer.

Rocky Mountain elk. *Photo by Cullen Balch.*

Humans: Social and Economic Considerations

Population

According to the 2011 Juab County Census, the population of the area was approximately 10,323 people. From 2000 to 2011, the Juab County population growth percentage was 24.4% (growing from 8,238 to 10,323 people).

Recreation

Juab County s home to the "Ute Stampede" rodeo, which is held every July. This event is a three-day celebration offering parades, craft show, car show, marathon, and golf tournament. The rodeo offers world class competitors and great family entertainment.

Yuba Lake is located in the southern portion of Juab County. The lake is thirteen miles long with a sandy beach along the north side. There are two boat ramps, which can be used for a fee. Located near the lake is a campsite operated by Utah State Parks.

The Little Sahara Recreation Area, located in the central portion of Juab County, consists of 60,000 acres of unique sand dunes and is managed by the Bureau of Land Management. Little Sahara is mainly used by off-road vehicles, such as dune buggies, dirt bikes, and four-wheel drive vehicles. Easter weekend annually attracts large crowds to the area for off-road vehicle races. An estimated 15,000 people visit the area each year during Easter weekend.

Driving along the Scenic Mt. Nebo Loop you will notice lush vegetation and colorful flowers. There are numerous lakes and streams, which are perfect for fishing. The area is abundant with big game and upland birds. In the winter, snow enhances the beauty of the wilderness landscape. Snowmobilers and cross country skiers enjoy following the winter trails of the loop.

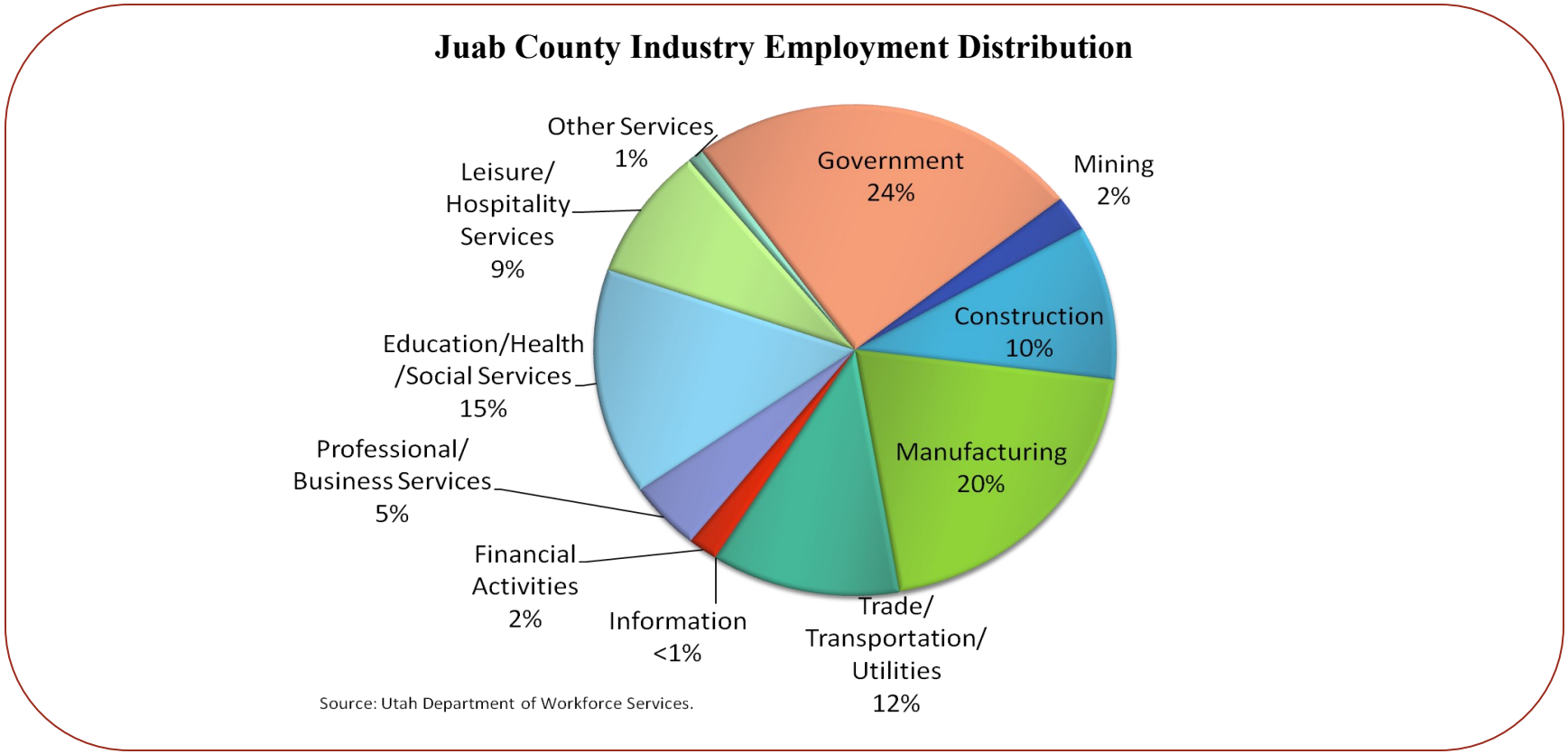
The marshlands that make up the Fish Springs National Wildlife Refuge are located in the central western portion of Juab County. There are 31 square kilometers of marsh in this area which are fed by fourteen springs or sets of springs. Within the wildlife refuge, four caves have been located and nominated for the National Register of Historic Places. The four caves are: Fish Springs Cave, Barn Own Cave, Hot Springs Cave, and Crab Cave. Each of these caves contain artifacts and information that thoroughly document 4,000 years of history. All of the known human cultures of the eastern Great Basin area have at one time or another occupied this area dating back at least 9,000 years. These were the Archaic group, the Fremont, Sevier, and finally the Paiute-Shoshones.

Juab County Population Data

Area name	Juab
Period Year	2011
Population	10,323
Births	195
Deaths	80
Natural Increase	115
Net Migration	-45
Annual Change	70
Annual Rate of Change	⇧ 0.7%

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

Yuba Lake. *Photo from Juab Travel Council.*



Economy/Labor Market

Juab County's primary economic base comes from agriculture, manufacturing, mining, recreation, and electrical power.

Juab County's population growth has often far outpaced its job growth, so many residents commute outside the county to work while enjoying the nonurban setting Juab provides. As a result, there is a ready workforce available to new businesses locating in the county.

The majority of the county's economic activity is focused in Nephi, which lies along I-15. Manufacturing is playing a larger and larger role in the county's economy. In addition, the construction of a new power plant in Mona will help diversify the county's employment base.

References & Credits

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County Overview

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PRIORITY CONCERNS

Water Improvement

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2. Utah Department of Agriculture and Food. Retrieved from www.ag.utah.gov.
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4. Juab CD Long Range Plan.

Rangeland Improvement

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4. Juab CD Long Range Plan.

Invasive Species Control

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