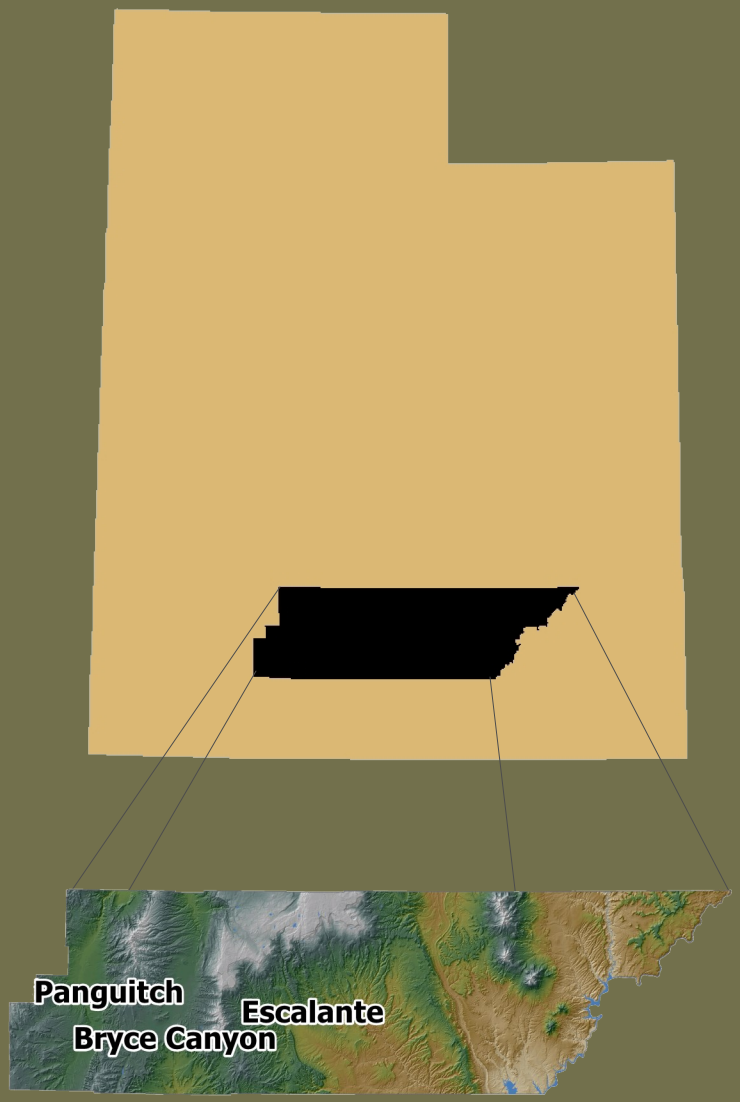
Garfield County Resource Assessment

January 2013

Conserving Natural Resources For Our Future

Upper Sevier & Canyonlands Conservation Districts



UACD
Utah Association of Conservation Districts

UDAF
Utah Department of Agriculture and Food

USDA NRCS Natural Resources Conservation Service

Acknowledgments

Upper Sevier & Canyonlands Conservation Districts

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 5
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

UtahPCD

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
Uintah County Commission

Credits

Tyce Palmer and Anne Excell – Writer/Document Compilation, Zone 5
Anne Johnson – GIS Specialist/Maps/Illustrations, UDAF
Patti Sutton – GIS Specialist, NRCS
Cherie Quincieu – Document Design, UACD
Kandice Johnson – Editor, UACD

Contributors/Specialists

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

Table of Contents

Garfield County Resource Assessment: Executive Summary

Farming, ranching, and recreation are important to Garfield County's economy.

Why a Resource Assessment?

The Garfield County 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 Garfield 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:

Upper Sevier & Canyonlands Conservation Districts
P.O. Box 806
Panguitch, UT 84759
(435) 676-8189

Natural Resource Priorities and Concerns

The Canyonlands and Upper Sevier County Conservation Districts have identified five natural resource priorities and concerns. These priorities receive special emphasis because of their immediate significance to Garfield County.

1. **Water Quality & Quantity**
2. **Rangeland Health**
3. **Noxious Weeds**
4. **Wildlife Issues**
5. **Federal Agency Relations**
6. **Riparian Areas**

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.

Soil: Erosion related to grazing management.

Water: Irrigation water management, impaired waterways.

Air/Climate: No significant concerns at this time.

Plants: Brush management, noxious weeds.

Animals: Sensitive species, wildlife depredation.

Humans: Improved AUMs, improved relations with federal agencies.

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 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 38 conservation districts.

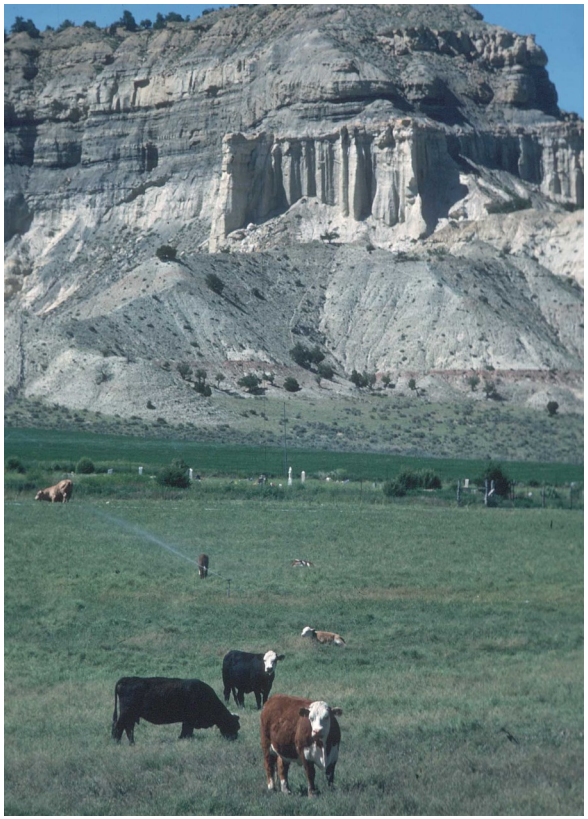
Conservation Progress

Since the organization of the Canyonlands Conservation District on June 6, 1966 and the Upper Sevier Conservation District on November 19, 1941, great strides have been made toward increasing and sustaining natural resources in Garfield County. The 2005 resource assessment listed the most critical resource concerns as 1) presence of invasive plants including noxious weeds, 2) soil loss or erosion on land or along stream channels, 3) adequate water supply for desired uses, 4) storm run-off or flooding, and 5) adequate food, water, and cover for livestock. The 2012 resource assessment provides an opportunity to evaluate the progress made during the last several years and to set new goals to address the highest priority conservation needs in Garfield County.

Public Outreach

In July 2010, the Canyonlands & Upper Sevier Conservation Districts conducted a survey to find out how the public views the county's natural resources and what conservation issues were most pressing. Respondents indicated that water quantity and quality are still major concerns, as well as properly managing grazing land to maintain a sustainable agricultural industry. Other top concerns included: weeds, particularly perennial pepper weed and dyer's woad; irrigation canal improvements and maintenance; protecting sage-grouse habitat; and maintaining current levels of recreational opportunities in Garfield County.

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.

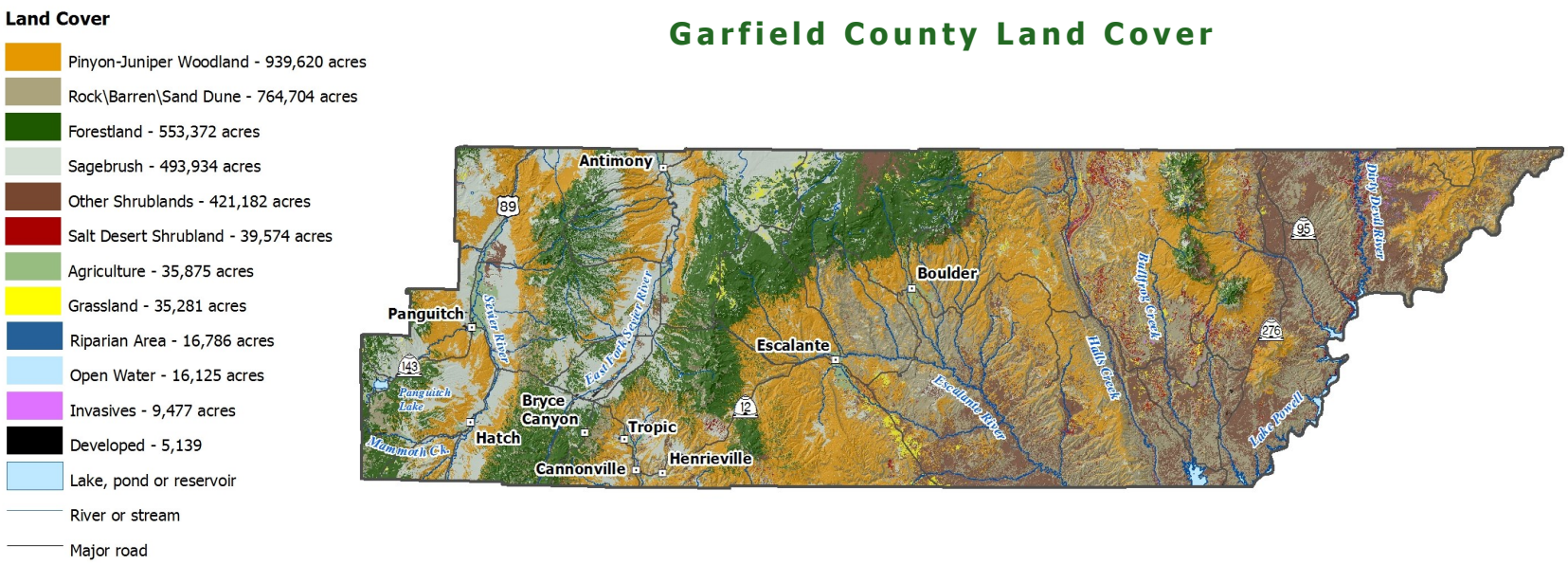


Garfield County Overview

Background

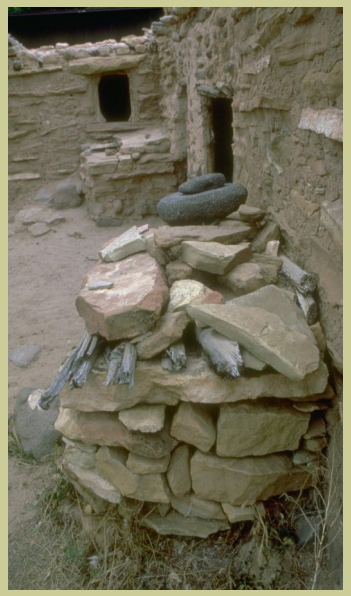
Garfield County is located in the south central section of Utah. It lies approximately 36 miles north of the Utah-Arizona line and 370 miles south of the Utah-Idaho line. The main highway running north and south through the county is U.S. Highway 89. Scenic Byway 12 runs east and west through the county. This county is famous for many national and state parks: Bryce Canyon NP, Capitol Reef NP, Calf Creek SP, Escalante Canyons SP, Anasazi Village SP, Petrified Forest SP, and Kodachrome Basin SP to name a few. Because of this most of the land in Garfield County is publicly owned. The fifth largest county in the state of Utah, Garfield County has an area of 3,338,880 acres and is approximately 150 miles from east to west and 43 miles from north to south. Only four percent of Garfield County is private land. The population is about 4,500. The average temperature in January is 24ºF and the average temperature in July is 66ºF. The average annual precipitation in the county is 10.3 inches.[1]

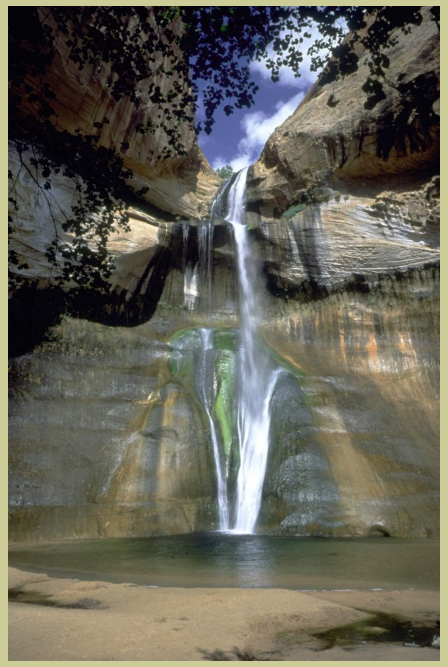
Garfield County depends more on tourism and recreation for employment than any other county in Utah. With Bryce Canyon, Lake Powell, state parks, and scenic beauties, the county attracts many, many visitors each year. Garfield County exhibits one of the highest unemployment rates in the state due to the seasonal nature of the tourist economy. Almost 40 percent of Garfield County's nonfarm employment can be categorized in the leisure and hospitality industry, in vivid contrast to the statewide figure of only nine percent.[2]



1 NRCS Garfield County Resource Assessment
2 www.jobs.utah.gov






Water Quality/Quantity

Garfield County is home to three major watershed/drainages and two conservation districts. Two of the watersheds drain into the Colorado River and one drains into the Sevier River Basin. The Paria and Escalante rivers are located in the central and eastern part of the county, while the Upper Sevier River sits in the western part of the county. Water quality and quantity is a priority issue for both conservation districts. Both districts are working with landowners to improve irrigation efficiency and management by converting farms to sprinkler and gated pipe irrigation systems. The water quality/quantity goals on the Upper Sevier River Watershed include: improving riparian areas and stream banks, which will reduce erosion and sediment into rivers and streams; improving irrigation efficiency; improving livestock management in pasture and meadows and along riparian and stream bank areas; improving uplands through brush and pinyon-juniper management; improving irrigation and canal water delivery systems; and helping animal feeding operations mitigate animal waste from entering adjacent waterways. The water quality/quantity goals in the Canyonlands Conservation District, which incorporates the Paria and Escalante Watersheds, include: reducing invasive species, such as Russian olive and tamarisk, along river banks and riparian areas; improving irrigation efficiency to reduce salinity and erosion; and improving uplands through brush and pinyon-juniper management.

Strategies

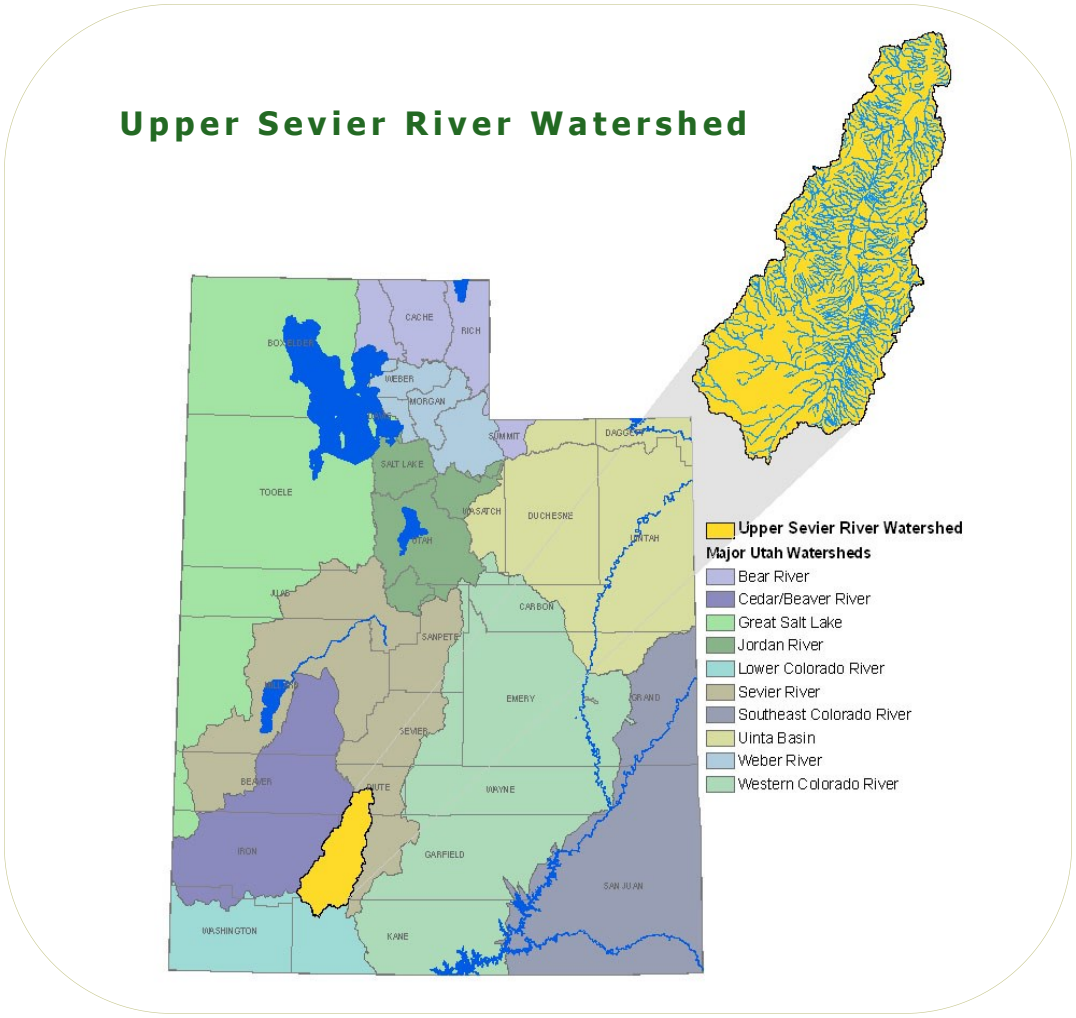
- Continue to work with landowners to improve irrigation water efficiency and management.
- Work with canal and irrigation companies, government entities, and conservation partners to develop plans and funding mechanisms to improve water delivery systems to local water users.
- Work with landowners and conservation partners to plan and implement Russian olive and tamarisk removal along river and stream channels.
- Assist small animal feeding operations (AFOs) to be in compliance with the state's water quality strategies.
- Continue to assist landowners and federal land managers in improving stream bank stabilization, to protect upland and rangelands from excessive run-off.

Action/Tasks

- Assist landowners with irrigation improvements.
- Assist private landowners with conservation planning, engineering, and developing funding mechanisms for water conservation projects.
- Assist canal and irrigation companies in developing more efficient water delivery systems.
- Help with countywide canal mapping initiative.
- Partner with other key groups and agencies to help finance planning and projects.
- Mitigate Russian olive and tamarisk from county's river and stream bank channels.
- Assist private landowners with conservation planning and funding for invasive species management.
- Partner with local, state, and federal partners in developing large scale Russian olive and tamarisk mitigation planning efforts.
- Assist animal feeding operations (AFOs) to be compliant with the state's water quality strategies.
- Assist small AFOs with conservation planning, engineering, and financial strategies to improve operation and improve water quality on the areas farms and ranches.
- Improve stream bank stabilization, to protect upland and rangelands from excessive run-off.
- Assist private landowners, permittees, and state and federal partners with planning efforts and funding mechanisms to improve water quality/quantity on private and public lands.

Outcomes

Outcomes related to water quality/quantity include increased efficiency of water resources, reduced erosion from upland and rangelands, reduced salinity loading into rivers and streams, reduced amounts of manure and nutrients in rivers and streams, improved grazing systems for livestock, and improved wildlife habitat.



Improved riparian area. Photos taken in Hatch, Utah.

Rangeland Health

Garfield County has a vast amount of rangeland resources. However, only four percent of the land in Garfield County is privately owned. The agricultural and ranching industry depend on the public grazing lands and their accompanying resources for economic stability. Therefore, it is in the county's best interest that the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) land management practices encourage economic and ecological viability. Livestock production in this rural county continue to play a vital role in the county's lifestyle and economic base. There is a need for better grazing management practices and rangeland improvements throughout the county. Encroachment of pinyon-Juniper and sagebrush is a priority concern. Lack of good pasture fences and grazing/pasture allotment management, along with poor water distribution and lack of spring developments, are also areas of concern. Promoting rangeland projects that will benefit the threatened sage-grouse is also a priority.

Strategies

- Promote proven science based grazing management practices and strategies throughout the county's public and private lands, prioritizing larger landscape scale projects on BLM, Forest Service, State Trust Lands, and BLM/Grand Staircase Escalante National Monument rangelands.
- Assist permittees and ranchers in implementing best management practices (BMPs) on private pastures and public grazing allotments that will improve and increase the carrying capacity of those pastures and allotments, thus maintaining healthy livestock production while stabilizing or increasing AUMs (animal unit months).
- Improve coordination with public land managers in prioritizing critical areas for conservation projects, meet with them on a more consistent basis, and educate them about the unique opportunities of working with conservation districts.

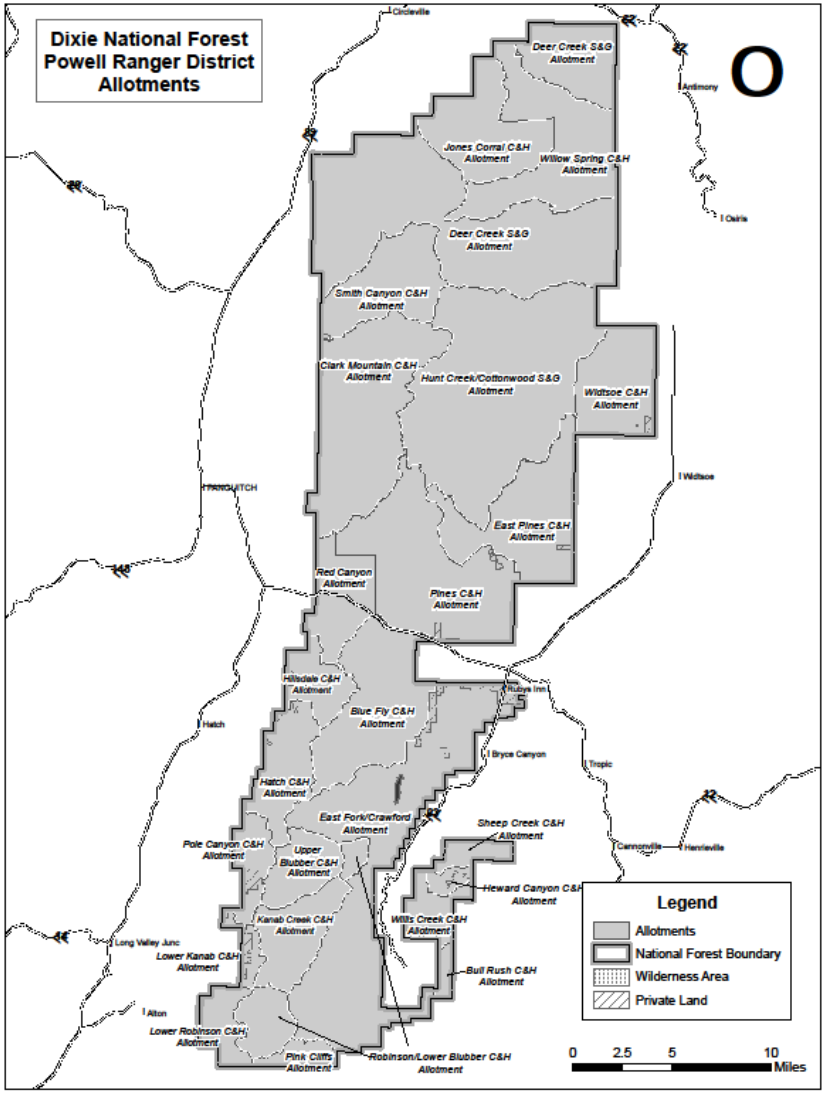
Action/Tasks

- Utilize Grazing Improvement Program (GIP) staff, district planners, extension agents, NRCS range specialists, and conservation partners to work with permittees and federal and state land managers to develop rangeland improvement projects, environmental assessments, and project plans for key landscapes needing improved conservation treatments.
- Promote and assist producers in applying for and giving technical assistance for federal and state conservation cost-share programs such as GIP, state Agriculture Resource Development Loans (ARDL), USDA Environmental Quality Incentive Program (EQIP), and other conservation programs.
- Coordinate with state and federal land managers at regional conservation coordinating committee meetings, conservation district meetings, range tours and workshops, UACD Zone Five annual meetings, regional GIP board meetings, and other regional/county functions and venues.
- Promote and look for large-scale management plans that could benefit the permittees, improve infrastructure (cost), and benefit the landscape for livestock and wildlife.

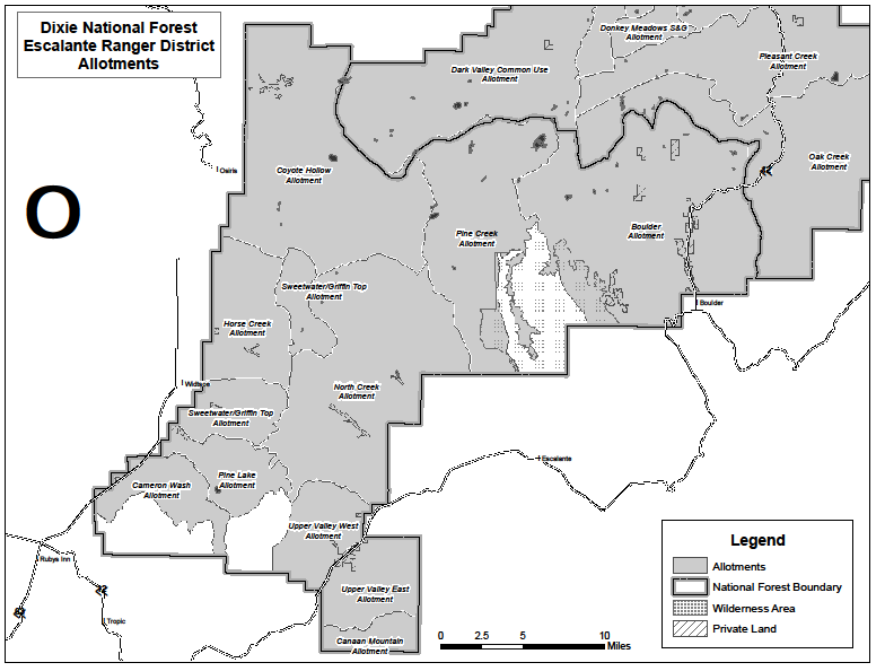
Outcomes

Outcomes related to rangeland health include improved health of rangelands and watersheds, increased carrying capacity for livestock and wildlife, increased positive cooperation with state and federal land management agencies, increasing the economic base of Garfield County, and maintained sustainability of the livestock industry within the county.

Powell Ranger District



Escalante Ranger District



Noxious Weeds

Noxious weed infestation and invasive species is a major concern and priority in Garfield County. Over the last several years, a ramped up effort throughout the county has taken place, with the reorganization of the county weed board, the creation of the Canyon Country Cooperative Weed Management Area (CWMA) and its committee, increased county funding for weed mitigation efforts, and additional opportunities for state weed grants to focus on critical priority areas. Noxious weeds such as musk thistle, Scotch thistle, bull thistle, white top, and Russian knapweed are among the top species that are targeted by the county. Invasive species, such as the Russian olive and tamarisk (saltcedar), are also being targeted on waterways and are a major problem in the central and eastern part of the county.

Strategies

- Increase funding opportunities for noxious weeds and invasive species.
- Develop more effective leadership as the county weed board, and broaden the board's identity and actions. Maintain relationship and cooperation with the CWMA.
- Develop a public outreach campaign educating citizens and landowners about noxious weeds.
- Improve county inventory of noxious weeds and where priority areas need to be focused.

Action/Tasks

- Develop state noxious weed grant proposals through the Canyon Country Cooperative Weed Management Area and the Garfield County Weed Board.
- Continue to upgrade county-wide weed and invasive species inventory maps for effective coordination and planning efforts.
- Develop a county noxious weed and invasive species information and education program through the CWMA, weed board, and conservation districts.
    - Sponsor noxious weed spray days in critical areas, with CWMA partnership and local landowners.
    - Present noxious weed education to youth at Natural Resource Field Days.
    - Support the annual Knapweed Days in Bryce Valley, through the CWMA.
    - Develop county noxious weed and invasive species information and materials to distribute to communities and landowners throughout the county.
    - Coordinate efforts with the Escalante River Watershed Project group in the mitigation of Russian olive and in developing conservation plans for private landowners.
- Develop effective county weed board meetings. Invite county commission and give direction and recommendations to county weed supervisor and seasonal staff. Give input to CWMA with weed grant proposals.

Outcomes

Outcomes related to noxious weeds and invasive species include increasing weed control, improving landscapes in the county's watersheds, improving water quality and quantity, increasing forage for livestock, and improving wildlife habitat on public and private lands.

Canada Thistle

Hoary Cress

Musk Thistle

Russian Knapweed

Saltcedar

Scotch Thistle

Utah Noxious Weed List

The following weeds are official 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 *(Onpordum acanthium)*
- Spotted knapweed *(Centaurea squarrosa)*
- Squarrose knapweed *(Centaurea squarrosa)*
- St. Johnswort *(Hypericum perforatum)*
- Sulfur cinquefoil *(Potentilla recta)*
- Yellow starthistle *(Centaurea solstitialis)*

*Bermudagrass is not considered a noxious weed in Washington County.

Wildlife Issues

Wildlife is an abundant resource in Garfield County, with both game species and non-game species. The county's citizens, including farmers and ranchers, have a great appreciation for vibrant, healthy farms/ranches, rangelands, and wildlife. With this in mind, the county's private agricultural land is a major habitat for the state's big game species, such as deer and elk. Because of this, the questions of who should bear the costs and who receives the benefits from publicly-owned wildlife often puts an excessive amount of burden on the agricultural community. The county also has areas that are home to the federally-listed Utah prairie dog, which also brings its own set of challenges with private landowners with property damage issues and mitigation efforts. The greater sage-grouse is also a sensitive species, on the decline within the county, many efforts are underway to keep it off the federal endangered species list and to maintain the species to increase its populations and to create healthy habitat for these historic game birds.

Strategies

- Support a proactive public education and involvement approach, which includes agriculture, sportsmen, government agencies, and other interested partners, that will promote and encourage important multiple use concepts and sustained yield principles in managing and maintaining the state's wildlife resources.
- Support cooperative agreements between landowners, permittees, the Division of Wildlife Resources (DWR), federal, state, and local agencies, and sportsmen to establish and maintain target numbers of wildlife consistent with public and private land habitat constraints.
- Manage elk populations in conjunction with local landowner input.
- Support and partner with the county's sage-grouse working group in developing plans and projects that will enhance and increase healthy grouse numbers and habitat.
- Discourage and oppose any transplanting of wildlife species into areas where historical presence cannot be shown.
- Support and maintain all current predator control methods and practices and the funding granted to the county for control of coyotes and other predators.
- Support policies that protect landowners engaged in voluntary conservation actions to conserve and manage candidate, threatened, and endangered species.

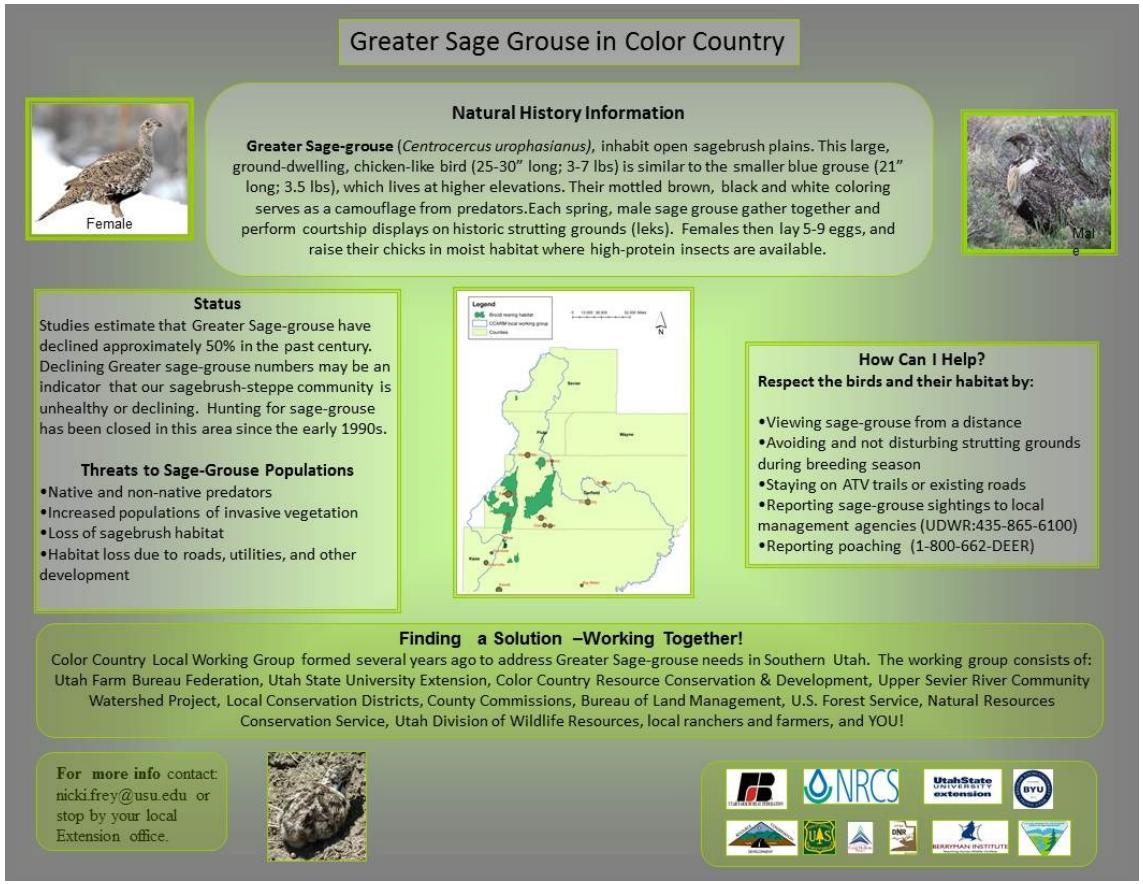
Action/Tasks

- Develop proactive relationships with wildlife authorities, locally elected officials, and conservation partners when developing large-scale projects, proposals, and plans for watershed health, which includes healthy forest land, rangeland, and agricultural lands.
- Take a leadership role, through a coordinated resource management planning approach, in identifying areas and watersheds where wildlife issues are a priority.
- Support the Garfield County Commission, livestock permittees, and grazing associations in opposing the transplant of 9,000 beavers on Boulder Mountain in Dixie National Forest.
- Support the granting of antlered big game permits to any landowners who have damages on cultivated lands that support big game, and not just qualifying ands over 640 acres. Continue to be a partner with the Color Country Adaptive Resource Management group in identifying landowners and areas suited for sage grouse habitat enhancement projects.

- Identify key voluntary landowners within sage grouse habitat areas with which to develop conservation projects.
- Support upland and rangeland projects that will benefit both grouse and livestock grazing on private and public lands.
- Work with local and federal agencies to develop efforts and ways to count prairie dogs on private lands to determine real populations so they can be de-listed from the threatened and endangered species list.

Outcomes

Outcomes related to wildlife issues include maintaining healthy and manageable numbers of elk and deer, creating healthier sustainable watersheds, increasing economic conditions for agricultural producers, increasing yield and carrying capacity on farms and rangelands, creating healthier populations of sage-grouse, and delisting the Utah prairie dog from the threatened and endangered species list.



Federal Agency Relations

Only about four percent of Garfield County is privately owned. This being the case, it is crucial that the two conservation districts in the county develop and maintain positive relationships with federal and state agencies. Coordinating with the Bureau of Land Management, U.S. Forest Service, and state agencies on resource management plans, project proposals, and natural resource issues will help promote the district's priorities and goals in maintaining sound conservation principles, practices, and important multiple uses on public lands, which is important to the citizens and producers of Garfield County.

Strategies

- Continue to work, plan, and coordinate with state and federal agencies to address natural resource conservation and continued multiple uses.
  - Coordinate with agencies in resource plans, resource assessments, and county planning efforts.
  - Invite and utilize federal and state partners in district board meetings and associated activities.
  - Continue to coordinate with federal and state partners within the local cooperative weed management area projects.

Action/Tasks

- Work with federal and state land managers and resource specialists in approving conservation projects for local cooperators, utilizing Grazing Improvement Program (GIP) contracts, USDA Environmental Quality Incentive Program (EQIP) contracts, state Agriculture Resource Development Loan (ARDL) Program projects and other funding sources for state and federal lands.
- Develop a positive relationship with the Utah Division of Wildlife Resources (UDWR) in coordinating wildlife management issues, including addressing appropriate wildlife numbers, management, and habitat conservation projects.
- Coordinate with the BLM and USFS in maintaining economic agricultural viability in the county's rural communities through improving and increasing grazing land carrying capacity for livestock and wildlife.
  - Develop conservation projects that will maintain or increase animal unit months (AUMs) on public grazing allotments.

Outcomes

Outcomes related to federal agency relations include improving coordination of important conservation projects and natural resource management on public lands, improving and maintaining economic viability in local communities, maintaining and sustaining local farms and ranches in Garfield County, and improving the natural resource base.

NRCS Natural Resources Conservation Service

UDAF

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

UTAH DNR WILDLIFE RESOURCES

FSA FARM SERVICE AGENCY

Riparian Areas

Riparian areas in Garfield County are important, as they can be an indicator of the water quality in a watershed. A healthy riparian zone can benefit people, wildlife, and livestock through increased production of biomass for forage, improved fisheries, hunting opportunities, wildlife habitat, and clean water. Proper functioning riparian areas can also help mitigate sediment downstream into lakes and reservoirs, which impact water users in cities and towns to irrigation water users. The major riparian corridors in Garfield County consist of the Upper Sevier River in the western part of the county, the Paria River drainage in the south central part of the county, and the Escalante River in the eastern part of Garfield County. There are also many riparian corridors from numerous streams and springs on the Boulder Mountain/Griffin Top/Aquarius Plateau region, Paunsagaunt Plateau/East Fork Sevier River region, Mt. Dutton area, and the Markagaunt Plataea/Cedar Mountain/Panguitch Lake region. Many riparian projects have been implemented on the Upper Sevier River and its tributaries as part of the Upper Sevier River Community Watershed Management Project. There are still many riparian improvements that have been identified as future projects and opportunities. Severe head cutting and sedimentation remain a problem on much of the Upper Sevier River. Saltcedar and Russian olive invasion are one of the main issues on the Paria River and Escalante River corridors. Many riparian areas in the headwater and high mountain areas have been impacted by high numbers of elk and lack of consistent grazing management strategies.

Strategies

- Continue to identify and promote best management practices on the Upper Sevier River, through a voluntary approach with local landowners, as part of the Upper Sevier River Community Watershed Project.
- Identify and develop watershed project CRMP efforts on the Escalante and Paria River Rivers, and their tributaries, in mitigating Russian olive and tamarisk in the riparian buffer zones.
- Identify landowners, on a voluntary basis, and assist them in developing conservation plans for riparian improvements on their landscapes.
- Continue to assist as the county's weed board in identifying noxious weeds and invasive species for mitigation projects.
- Work with livestock grazing permittees and federal agency land managers in riparian improvement projects on Forest Service, BLM, and state lands.

Action/Tasks

- Utilize the Upper Sevier Community Watershed Document and Watershed Steering Committee Process to identify riparian conservation projects on the Upper Sevier River Watershed(s).
- Partner with local, state, and federal agencies, as well as local landowners, to identify riparian improvement projects on the Escalante River, Paria River Watershed, and tributaries.
- Partner with the Forest Service, BLM, and associated livestock permittees in improving riparian corridors and buffer zones on federal lands.
- Coordinate with the Grazing Improvement Program (GIP) Coordinator and GIP board, federal range specialists, state wildlife authorities, and permittees in identifying key riparian area improvement projects and funding sources.
- Coordinate with the Color Country Cooperative Weed Management Area (CWMA) in identifying projects and grant applications to mitigate invasive species, such as Russian olive and tamarisk, on the Escalante and Paria River Watersheds and associated drainages.

Outcomes

Outcomes related to improving riparian areas include improving water quality and quantity for citizens, wildlife and livestock, improving important critical habitat for wildlife, developing better filter systems on a watershed scale, and improving relationships and win/win situations with federal land managers, permittees, and special interest groups.

Photos courtesy of Utah Department of Water Quality.

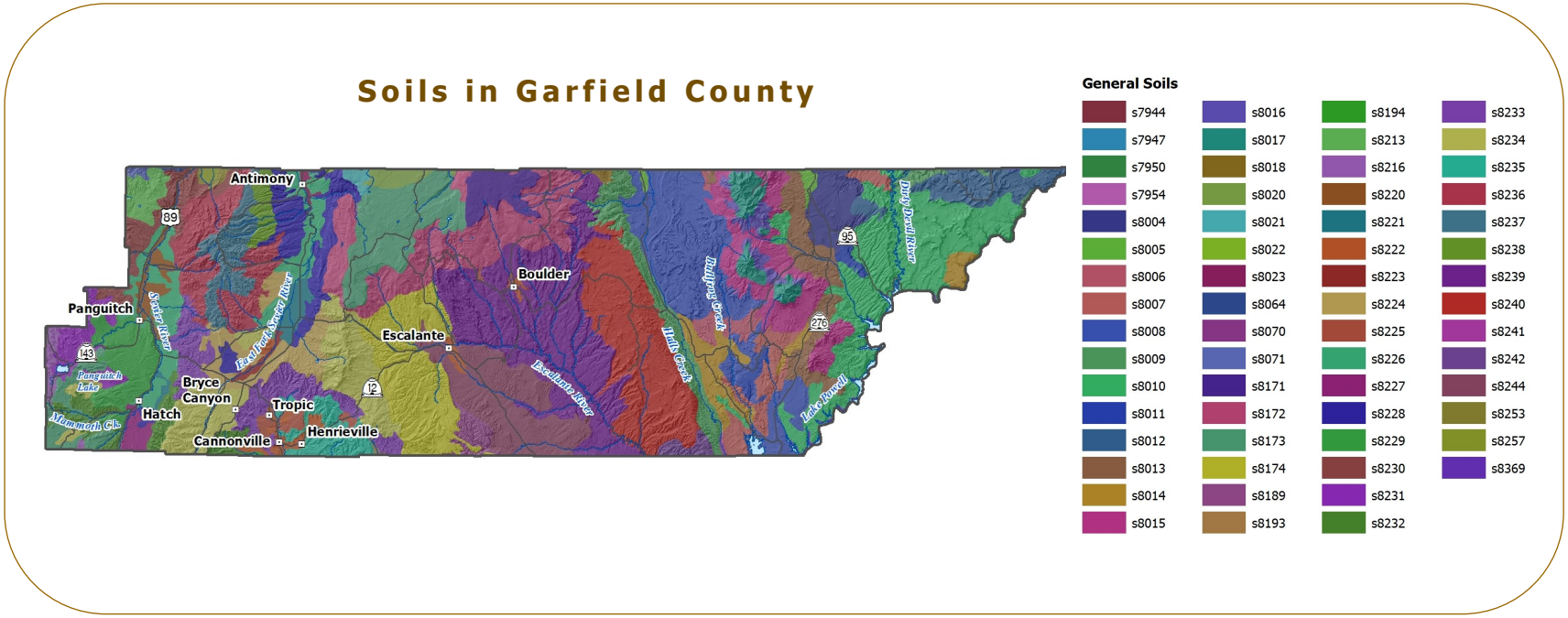
Photos taken by Wally Dodds, Upper Sevier River Watershed Coordinator.

Soil

The mineral resources in Garfield County include deposits of gravel, coal, and oil. Sand and gravel deposits are abundant along major rivers in Garfield County and are used mainly for road construction and maintenance. Oil drilling and exploration have been quite active in past years but have been reduced in recent times due to poor economic conditions. Large coal deposits have been discovered and explored in the Tropic, Cannonville, and Henrieville areas of Garfield County, but at the present time, there are no commercial coal mines in the area. Some mining of basalt and volcanic rock, as for use in landscaping, is done in the southern region of the county.[1]

Information on the soils in Garfield County can be obtained from the Web Soil Survey (WSS) at: 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 over laid 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, chemical, and physical properties. Using this information, agricultural 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.



1 Soil Survey of Garfield County

Water

The Sevier River, the Escalante River, Panguitch Creek, Boulder Creek, the East Fork of the Sevier River, and the Paria River and their tributaries are the major sources of surface water in Garfield County. These streams are fed mainly by snowmelt and ground water discharge from nearby mountains.

Rainfall in Garfield County is not adequate for the most commonly grown crops; there fore, supplemental irrigation is required to obtain acceptable crop yields.

Most irrigation water for the survey area is diverted from the rivers and streams. Tropic Reservoir, Wide Hollow Reservoir, and Panguitch Lake are the only major irrigation reservoirs in the area. Many smaller reservoirs have been built in the area, but they are used mainly for water regulation, rather than storage.

Several irrigation companies in Garfield County have converted from furrow and flow irrigation to gravity and pressurized sprinkler systems. This conversion is an attempt to increase irrigation efficiency, to increase crop production, and to help eliminate the late-season water shortages that occur in most of the area.

In some areas, well water, or water collected from springs and seeps and water in ponds, is distributed by pipeline to help prevent livestock from grazing in one area.[1]

Irrigation water in Garfield County comes from the following sources:

- Panguitch-Sevier River
- Tropic-East Fork of the Sevier River
- Hatch-Sevier River and its tributaries
- East Valley-Underground rights
- Cannonville-Paria, underground rights
- Henrieville-Henrieville Creek
- Antimony-East Fork of the Sevier River
- Escalante-Wide Hollow Storage, Escalante River
- Boulder-Boulder Creek, Escalante River and its tributaries

According to the 2007 Agricultural Census of Garfield County, there were 81,866 acres of farm land and 22,331 acres of irrigated farm land.

Domestic water comes from natural springs and creeks around the county.

Garfield County Sub-Watershed Boundaries

Garfield County takes in the Upper Sevier, East Fork Sevier, Fremont, Dirty Devil, Upper Lake Powell, Escalante, Lower Lake Powell, and the Paria Watersheds.

The Natural Resource Conservation Service (NRCS) encourages local people to lead a voluntary, coordinated, and integrated watershed approach to address natural and human resource conservation needs.

1 Soil Survey of Garfield County

Air and Climate

Because of the short growing season of the high mountain valleys of Garfield County, and the extreme cold in some parts of the county, the agricultural industry has been centered around raising livestock. The cold temperatures and short growing season limit the growth of many commercial crops in Panguitch and the Johns Valley areas. Native grasses, alfalfa hay, and some small grain crops are grown and are used mainly for winter feed for livestock. The warmer climate in the Tropic, Cannonville, Henrieville, and Escalante areas permits the raising of some small fruit and other commercial crops.[1] In 2010, there were 53 frost free days in Garfield County. Annual rainfall for the county averages ten to twelve inches per year. Other water falls during the winter as snowfall and occasionally during the summer storms.

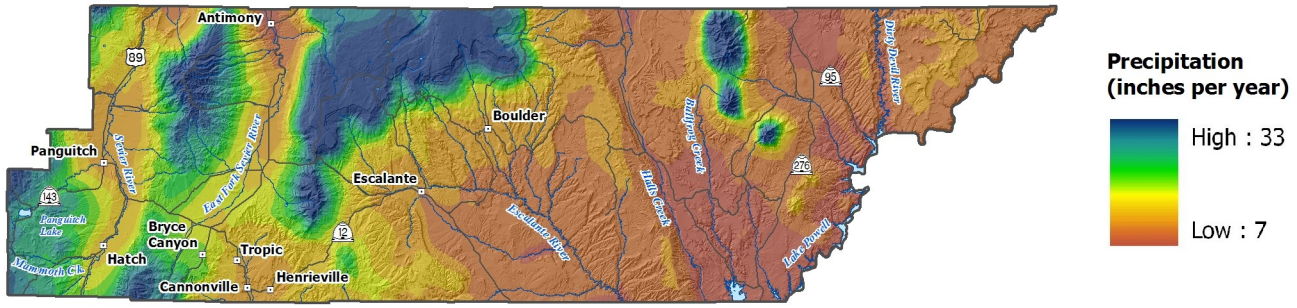
The Natural Resource Conservation Service (NRCS) installs, operates, and maintains an extensive automated system (SNOwpack TELemetry or SNOTEL) designed to collect snowpack and related climatic data in the Western United States and Alaska. In 1935, NRCS, then the Soil Conservation Service, established a formal cooperative Snow Survey and Water Supply Forecasting (SS-WSF) Program to conduct snow surveys and develop accurate and reliable water supply forecasts. The program operates under technical guidance from the NRCS National Water and Climate Center (NWCC).

SNOTEL provides a reliable and cost effective means of collecting snowpack and other meteorological data needed to produce water supply forecasts and support the resource management activities of NRCS and others. [2]

There are three SNOTEL sites located in Garfield County. These are: Jones Corral, operating since September 20, 2007 at an elevation of 9,749 feet; Clayton Springs, operating since June 6, 2000 at an elevation of 10,049 feet; and Widtsoe, operating since October 1, 1978 at an elevation of 9,640 feet.

Garfield County Average Annual Precipitation

INCHES/YEAR



1 Soil Survey of Garfield County
2 NRCS National Water and Climate Center

Plants

Irrigated crops grown in Garfield County are alfalfa, small grains (mostly alfalfa rations, not a commodity crop), and pasture. The majority of the hay grown in Garfield County is used locally for winter livestock feed, but some is sold and shipped to other parts of the western United States. Due to the lack of precipitation, there are no dry land crops grown in Garfield County. Because the growing season is so short, crops are not high in production, with the average farm producing 2.5 tons of hay per acre.

Noxious weeds are a major concern in Garfield County. The Canyon Country Weed Management Area was formed in 2008 to help combat the noxious weeds in the county. Annual noxious weed spraying days are held throughout the county with the help of state and federal agencies and local farmers and ranchers.

Ninety-five percent of Garfield County is public land and is used for cattle grazing. It is managed by public land management agencies such as the U.S. Forest Service and the Bureau of Land Management. The main grazing species are perennial grasses and forbes, some native and some introduced. [1]

According to the 2010 Utah Agricultural Statistics, there was 32,000 tons of alfalfa and alfalfa mix hay produced on 9,600 acres of ground in 2009.

1 Soil Survey of Garfield County

Animals

Livestock

According to the 2010 Utah Agricultural Statistics, there were 16,000 cattle and calves, with 9,000 of those cattle being beef cows, and 400 sheep and lambs in Garfield County. According to the 2007 U.S. Census of Agriculture, there were three goat farms, eight bee farms (with a total of 38 colonies), 1,247 horses and ponies, and 32 farms, with a total of 1,375 miscellaneous poultry in Garfield County. The sheep in the county produced 2,829 pounds of wool in 2007. The average of livestock sales for 2007 was $5,010,000.

Sensitive Species

Greater Sage-Grouse

The greater sage-grouse, *Centrocercus urophasianus*, is also known as the sage-hen and the sage-chicken. These birds inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the predominant plant of quality habitat. Where there is no sagebrush, there are no sage-grouse. A good understory of grasses and forbs, and associated wet meadow areas, are essential for optimum habitat. The principal winter food item is sagebrush leaves. During summer, the fruiting heads of sagebrush, leaves, and flower heads of clovers, dandelions, grasses and other plants are taken. Insects are also taken during the summer. Sage-grouse are the only North American grouse which do not have a muscular grinding gizzard.

Sage-grouse were abundant in pioneer times, but sagebrush eradication and intensive use of lands by domestic livestock have reduced their numbers. Sage-grouse range is declining in Utah, in both quantity and quality. Indiscriminate spraying of sagebrush, cropland conversion, and over-grazing of mountain meadows are the causes. The result has been an overall decline in sage-grouse populations. sage-grouse range has declined 50 percent from historical times. Greater sage-grouse are native to Utah and are listed as a sensitive species by the Utah Division of Wildlife Resources.[1]

Utah Prairie-Dog

The Utah prairie-dog, *Cynomys parvidens*, is one of three prairie-dog species found in Utah, occurring in the southwestern part of the state. Interestingly, the species is not found anywhere else in the world, making it the only non-fish vertebrate endemic to (found only in) Utah. The Utah prairie-dog is so rare that is has been federally listed as a threatened species.

Similar to other prairie-dogs, Utah prairie-dogs form colonies and spend much of their time in underground burrows, often hibernating during the winter. The species breeds in the spring, and young can be seen above ground in late May or early June. The Utah prairie-dog's diet is composed of flowers, seeds, grasses, leaves, and even insects. Major threats to the species include habitat loss (through development and drought), poisoning, and the plague.[1]

1 Utah Conservation Data Center

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 Garfield County:

- **Greater sage-grouse***
- **Yellow-billed cuckoo**
- **Black-footed ferret**
- **Bear Lake sculpin**
- **Bear Lake springsnail**
- **Bear Lake whitefish**
- **Bobolink**
- **Bonneville cisco**
- **Bonneville cutthroat trout**
- **Burrowing owl**
- **California floater**
- **Ferruginous hawk**
- **Lewis's woodpecker**
- **Northern goshawk**
- **Pygmy rabbit**
- **Western toad**
- **White-tailed 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 candidate species 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/.

HUMANS: Social and Economic Considerations

In the 2000 population estimate put together by the Governor's Office of Planning and Budget, the estimated population of Garfield County was 4,735, with Panguitch City having 1,623 people. The same office put out a document in 2010 and the population of Garfield County had grown to 5,172, with Panguitch City having 1,520 people. That's a county growth of 9.2% in 10 years.

In October of 2011, the total labor force in Garfield County was 2,954 people and the unemployment rate was 8.1%, compared to the state's labor force of 1,338,703 and unemployment rate of 6.3%.[1]

Garfield County is home to Bryce Canyon National Park, Capitol Reef National Park, Grand Staircase Escalante National Monument, Lake Powell, Anasazi State Museum, Kodachrome Basin, and Petrified Forest State Park. Garfield County attracts many, many travelers each year. Because of the seasonal economy of Garfield County, there are high unemployment rates during the winter.

Garfield County Population Data

Area name	Garfield
Period Year	2009
Population	5,149
Births	60
Deaths	41
Natural Increase	19
Net Migration	86
Annual Change	105
Annual Rate of Change	⇧ 2.1%

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

1 Utah Department of Workforce Services

REFERENCES

Introduction

Page 1: Photo courtesy of NRCS

County Overview

Page 2: Garfield County Land Cover map courtesy of Anne Johnson, UDAF
Page 3: Pictures courtesy of the Garfield County Travel Council

PRIORITY CONCERNS

Water Quality/Quantity

Page 5: Map and photos courtesy of Wally Dodds, Upper Sevier Watershed Coordinator

Rangeland Health

Page 7: Permit maps courtesy of US Forest Service, www.fs.usda.gov/resources/dixie/landmanagement/resourcemanagement
Photo courtesy of NRCS

Noxious Weeds

Page 9: Noxious weed photos taken by Nathan Belliston, Uintah County Weed Department and available at the Utah Weed Control Association website at: www.utahweed.org

Wildlife Issues

Page 11: Sage-grouse information courtesy of Nicki Frey, Utah State University

Federal Agency Relations

Page 13: Agency logos courtesy of respective websites
Photos courtesy of UACD Zone 5

Riparian Areas

Page15: Photos courtesy of Utah Department of Water Quality and Wally Dodds, Upper Sevier River Watershed Coordinator

GENERAL RESOURCE OBSERVATIONS

Soil

Page 16: [1] Soil Survey of Garfield County
Garfield County General Soils Map courtesy of Anne Johnson, UDAF

Water

Page 17: [1] Soil Survey of Garfield County
Garfield County Sub-Watershed Map courtesy of Anne Johnson, UDAF

Air

Page 18: [1] Soil Survey
[2] NRCS National Water and Climate Center, www.wcc.nrcs.usda.gov
Garfield County Average Annual Precipitation map courtesy of Anne Johnson, UDAF

Plants

Page: 19: [1] Soil Survey of Garfield County
Garfield County Land Use/Land Cover map courtesy of Anne Johnson, UDAF

Animals

Page 20: [1] Photos and information regarding sensitive species in Garfield County courtesy of Utah Conservation Data Center, http://dwrcdc.nr.utah.gov/ucdc/

Humans

Page 21: [1] Utah Department of Workforce Services, www.jobs.utah.gov
Photos courtesy of the Garfield County Travel Council