



United States Department  
of Agriculture



Natural Resources  
Conservation Service

Lakewood, Colorado

RWA 14030001

April 2010

# Westwater Canyon Watershed

Hydrologic Unit Code 1403000

Rapid Assessment





The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.)

Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410, or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

## Introduction

### Background Information

The Natural Resources Conservation Service (NRCS) is encouraging the development of rapid watershed assessments in order to increase the speed and efficiency generating information to guide conservation implementation, as well as the speed and efficiency of putting it into the hands of local decision makers.

Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best actions to achieve their goals.

### Benefits of these Activities

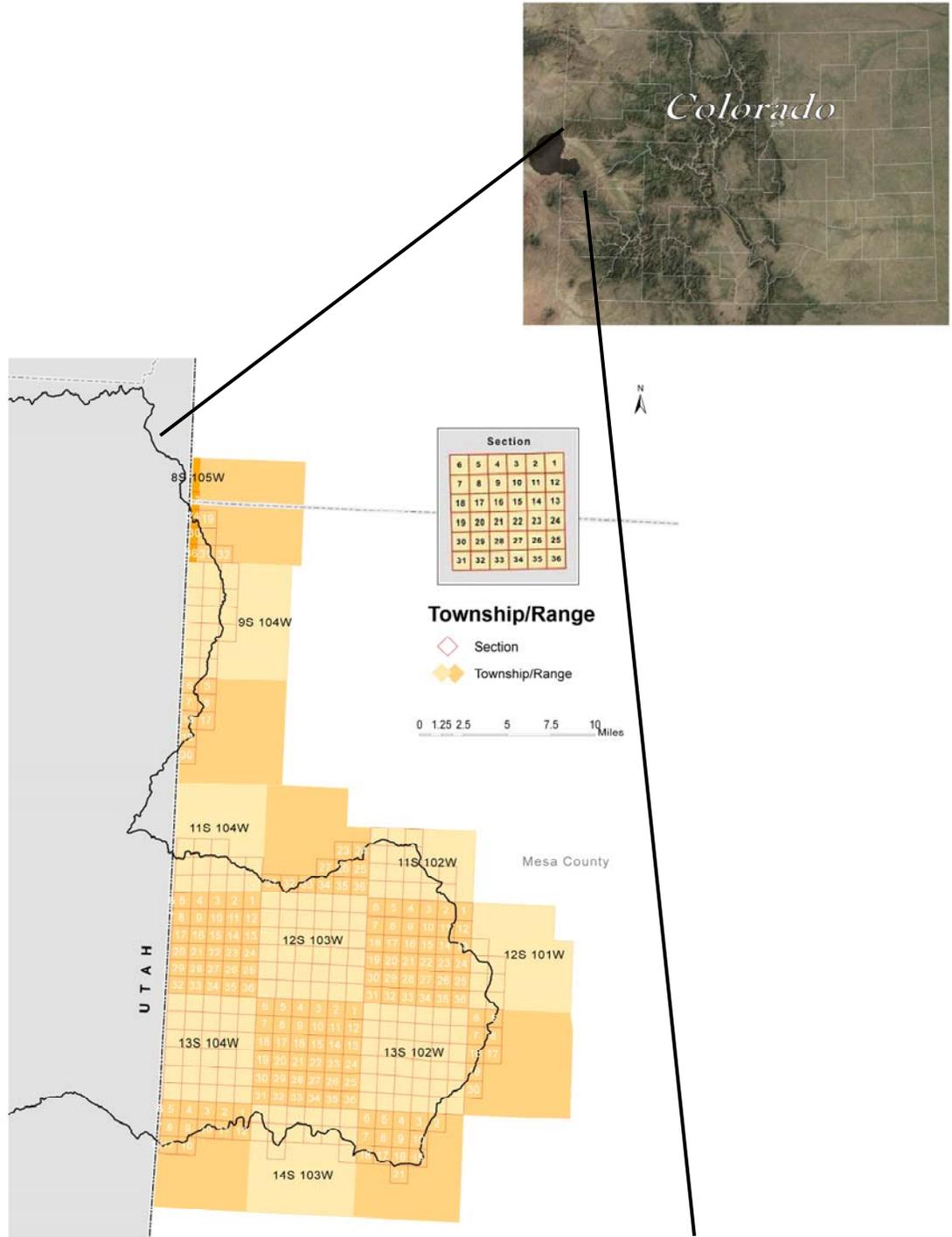
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

- Quick and inexpensive tools for setting priorities and taking action
- Providing a level of detail that is sufficient for identifying actions that can be taken with no further watershed-level studies or analyses
- Actions to be taken may require further Federal or State permits or ESA or NEPA analysis but these activities are part of standard requirements for use of best management practices (BMPs) and conservation systems
- Identifying where further detailed analyses or watershed studies are needed
- Plans address multiple objectives and concerns of landowners and communities
- Plans are based on established partnerships at the local and state levels
- Plans enable landowners and communities to decide on the best mix of NRCS programs that will meet their goals
- Plans include the full array of conservation program tools (i.e. cost-share practices, easements, technical assistance)

---

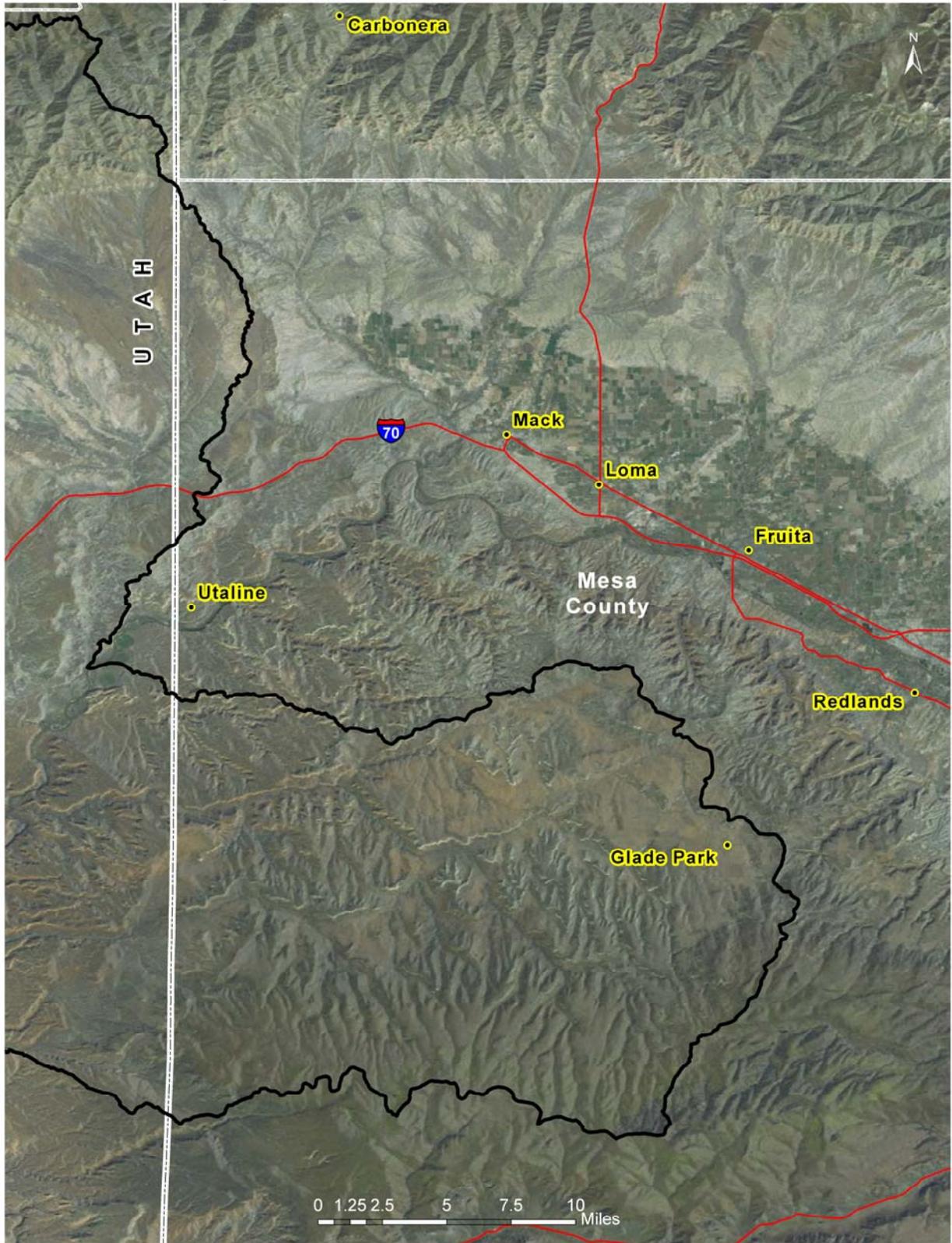
Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

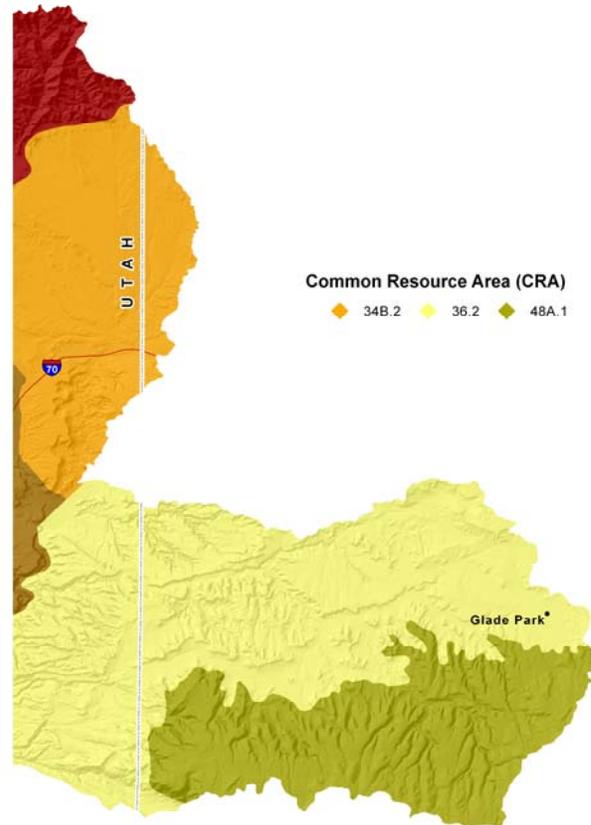
---



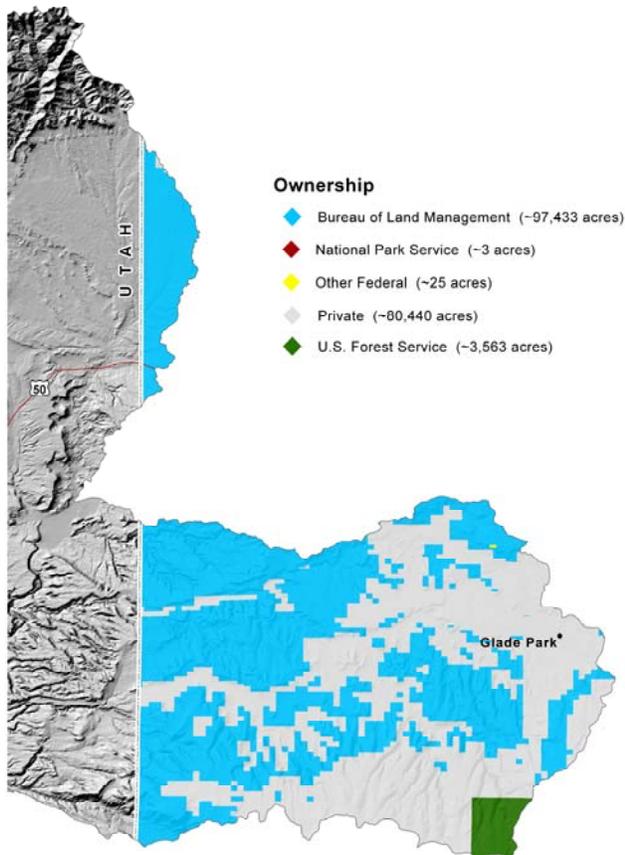
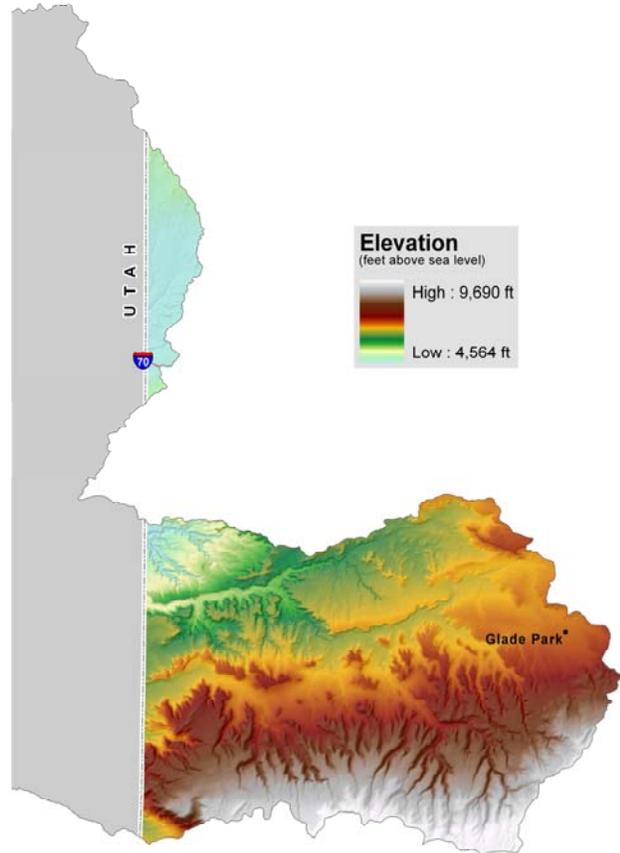
<b>COLORADO County</b>	<b>County Acres</b>	<b>County Acres in WESTWATER CANYON Watershed</b>	<b>% of County in the Watershed</b>	<b>% of Watershed in the County</b>
Mesa	2,140,821	181,641	8.5%	19.5%
<b>UTAH County</b>				
Grand	2,362,856	752,112 933,753	31.8%	80.5%

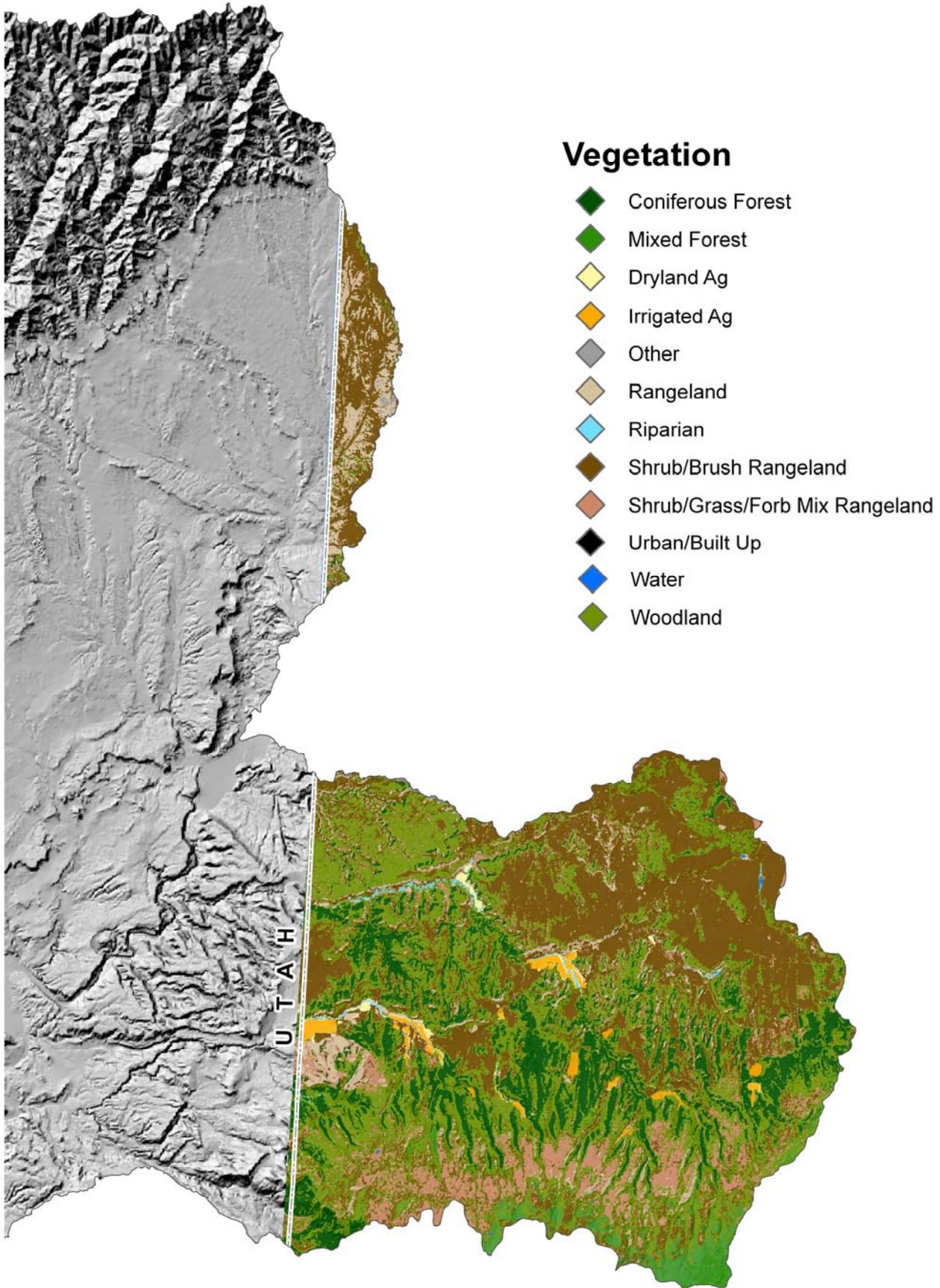
# Westwater Canyon Watershed - 14030001





MLRA	CRA	CRA NAME	CRA DESCRIPTION
34B	<b>34B.2</b>	Warm Central Desertic Basins and Plateaus - Uncompahgre and Grand Valleys	This area is in the broad valleys of the Uncompahgre and Colorado Rivers. It includes a sizeable area of irrigated cropland, vineyards, and orchards. The temperature regime is mesic and the moisture regime is aridic (typic aridic subclass). Natural vegetation is typically shadscale, Gardner saltbush, and mat saltbush. Frost free periods are long, in some places more than 180 days.
36	<b>36.2</b>	Southwestern Plateaus, Mesas, and Foothills - Warm Semiarid Mesas and Plateaus	This area encompasses the lower elevation mesas and plateaus. The temperature regime is mesic and the moisture regime is transitional from ustic to aridic. Vegetation is typically two needle pinyon, Utah juniper, and big sagebrush. Cropland is a significant land use in parts of this area, particularly on soils formed in thick deposits of eolian material. Precipitation ranges from 10 to about 16 inches. Elevations range from about 6,000 to 7,000 feet.
48A	<b>48A.1</b>	Southern Rocky Mountains - High Mountains and Valleys	This area is best characterized by steep, high mountain ranges and associated mountain valleys. The temperature regimes are mostly frigid and cryic; moisture regimes are mainly ustic and udic. Vegetation is sagebrush-grass at low elevations, and with increasing elevation ranges from coniferous forest to alpine tundra. Elevations range from 6,500 to 14,400 feet.



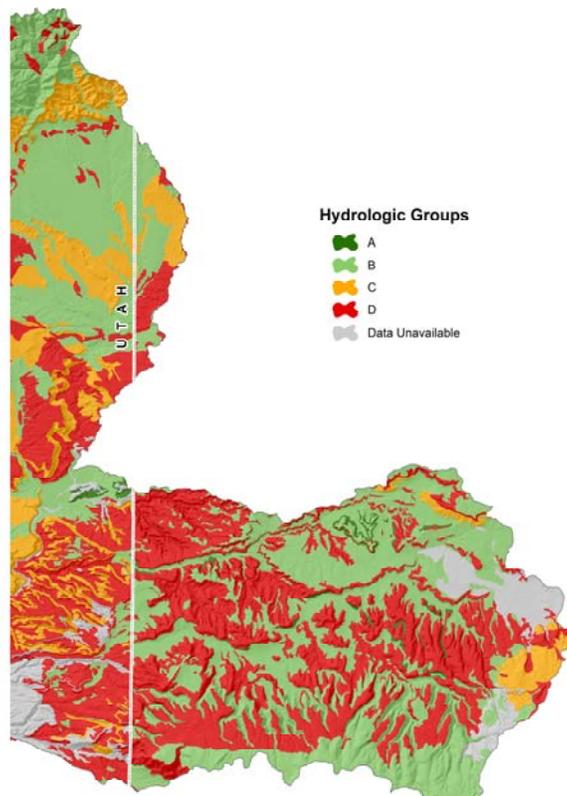
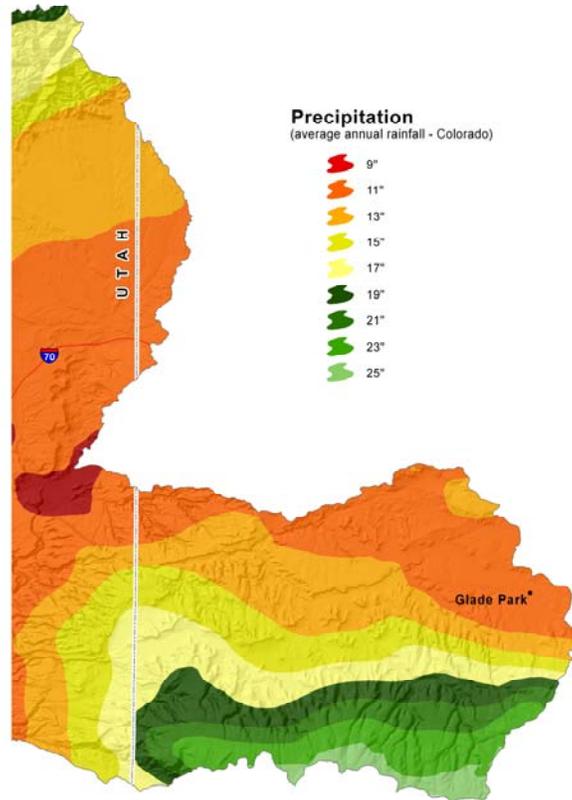


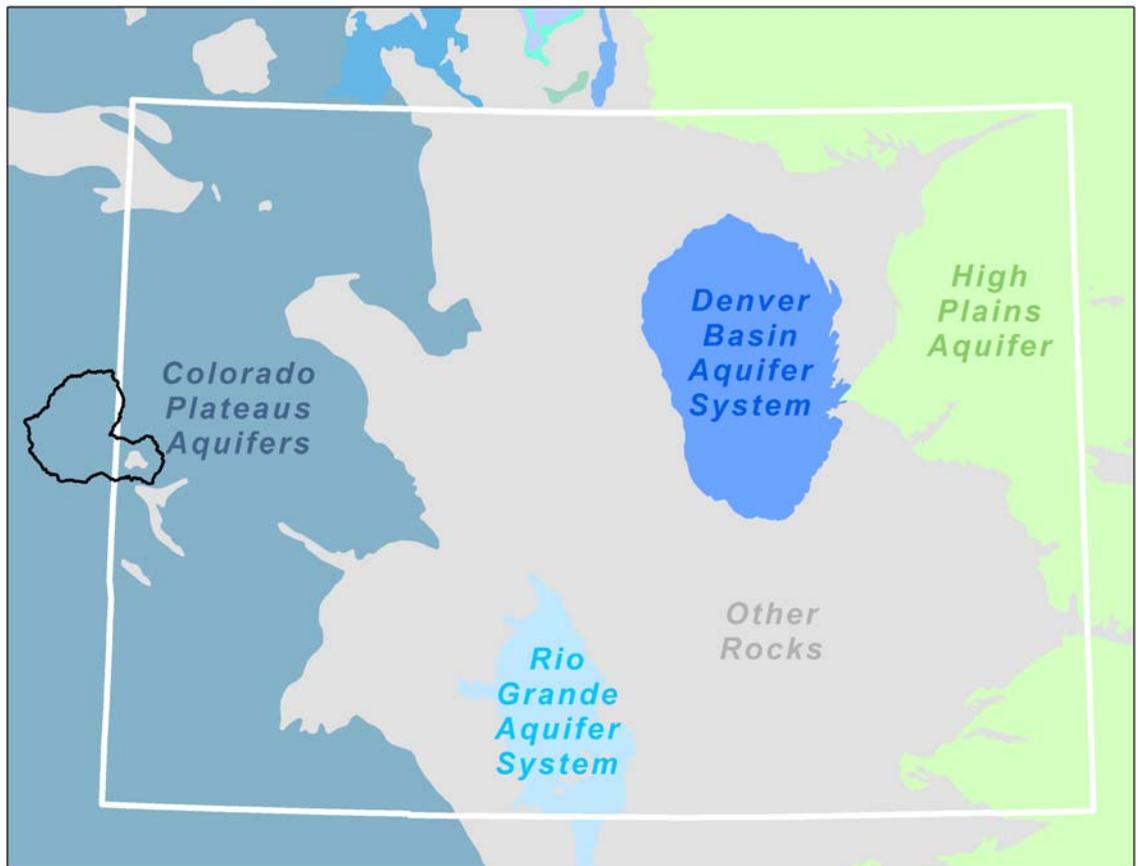
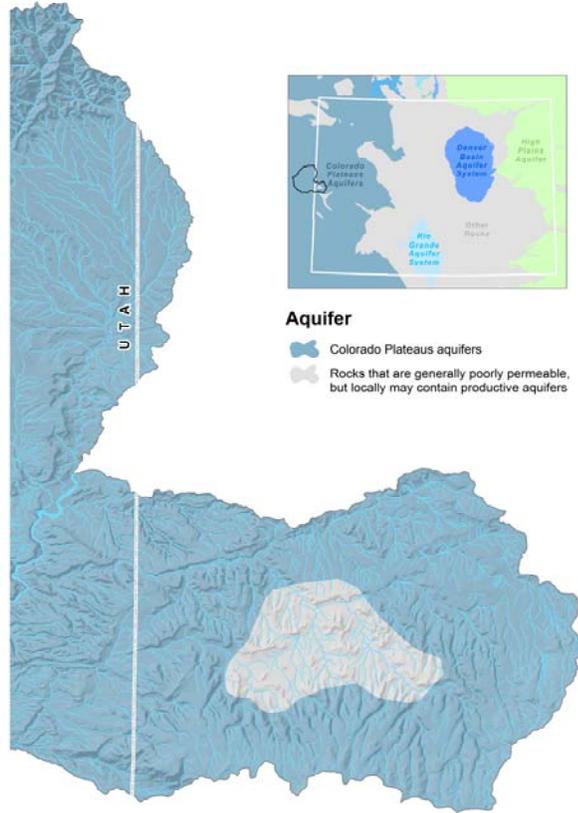
<u>WESTWATER CANYON WATERSHED Land Use</u>	Total Acreage	Vegetation	Acreage
Cropland	2,563	Irrigated Ag* Dryland Ag	1,910.0 653.0
Rangeland/Grassland	168,113	Disturbed Rangeland Gambel Oak Grass/Forb Rangeland Greasewood Juniper Juniper/Sagebrush Mix Mesic Mountain Shrub Mix PJ-Mtn Shrub Mix PJ-Oak Mix PJ-Sagebrush Mix Pinon-Juniper Rabbitbrush/Grass Mix Sagebrush Community Sagebrush/Gambel Oak Mix Sagebrush/Grass Mix Sagebrush/Greasewood Sagebrush/Mesic Mtn Shrub Mix Saltbush Community Shrub/Brush Rangeland Snakeweed/Shrub Mix Snowberry/Shrub Mix Sparse Juniper/Shrub/Rock Mix Sparse PJ/Shrub/Rock Mix	3,688.8 13,979.0 5,013.2 599.8 227.6 7.3 5,660.7 4,584.7 22.7 32,381.6 21,511.5 62.7 41,155.6 5,896.9 15,499.3 0.2 29.7 8,826.3 882.9 40.5 645.1 523.6 6,873.9
Forest	7,692	Aspen Douglas Fir Douglas Fir/Aspen Mix P. Pine/Gambel Oak Mix Ponderosa Pine Spruce/Fir/Aspen Mix	3,405.4 21.5 787.8 208.3 3,239.1 29.8
Riparian	686	Riparian	685.6
Water	189	Water	189.0
Other	2,564	Barren Land Commercial Rock Soil Talus Slopes & Rock Outcrops	2,201.0 0.3 0.3 188.6 173.7
<b>~Total Watershed Acres</b>			<b>181,806.8</b>

\* Colorado Decision Support System Data

## Precipitation

Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series of hot, dry summers following a period of scant mountain snowpack created water shortages. The fourth drought hit parts of Colorado in the late 1970s. In this century, the most severe drought since 1723 hit the state in 2002. Prior to the 1700's, researchers looking at tree ring records have found evidence of even more severe droughts, some lasting many years. Rainfall occurs as frontal storms in the spring and early summer and high intensity, convective thunderstorms in late summer. Maximum precipitation is from mid spring through late autumn. Precipitation in winter is usually snow.





**Class 1** - soils have few limitations that restrict their use.

**Class 2** - soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

**Class 3** - soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

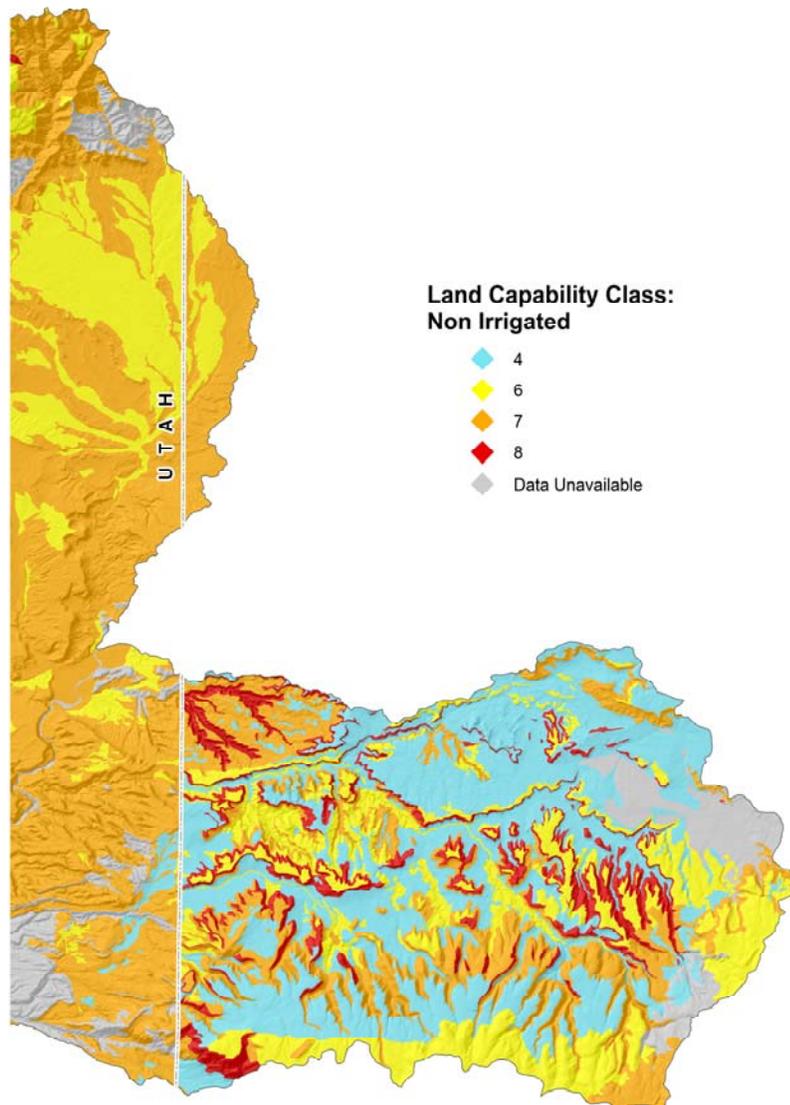
**Class 4** - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

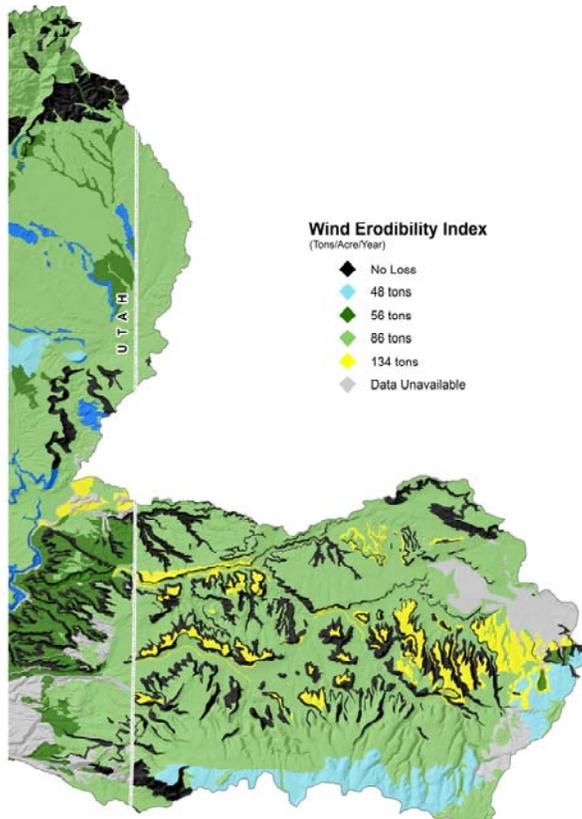
**Class 5** - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

**Class 6** - soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

**Class 7** - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

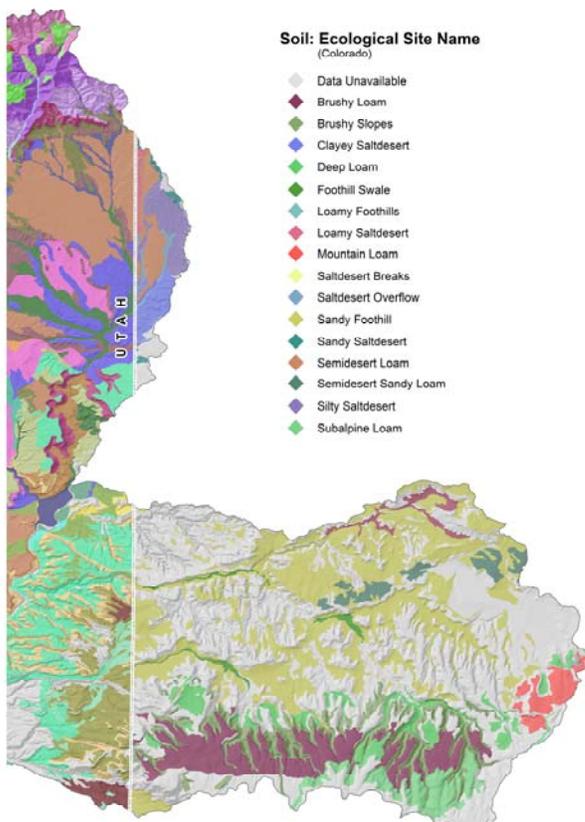
**Class 8** - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

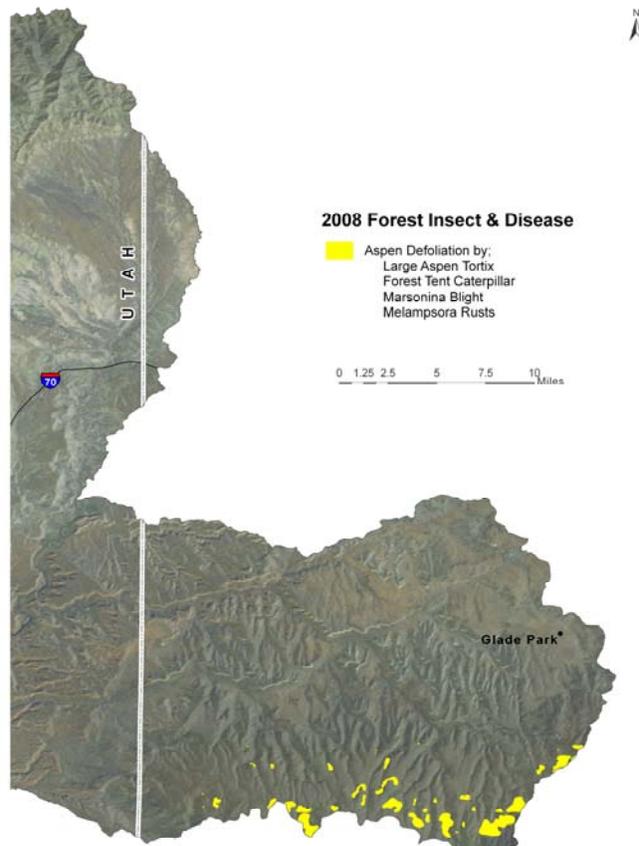
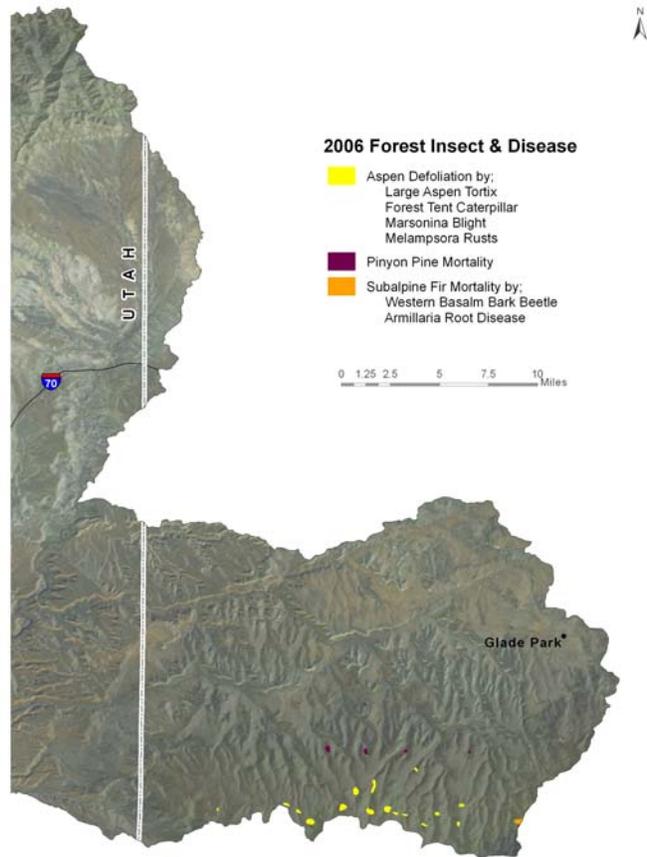


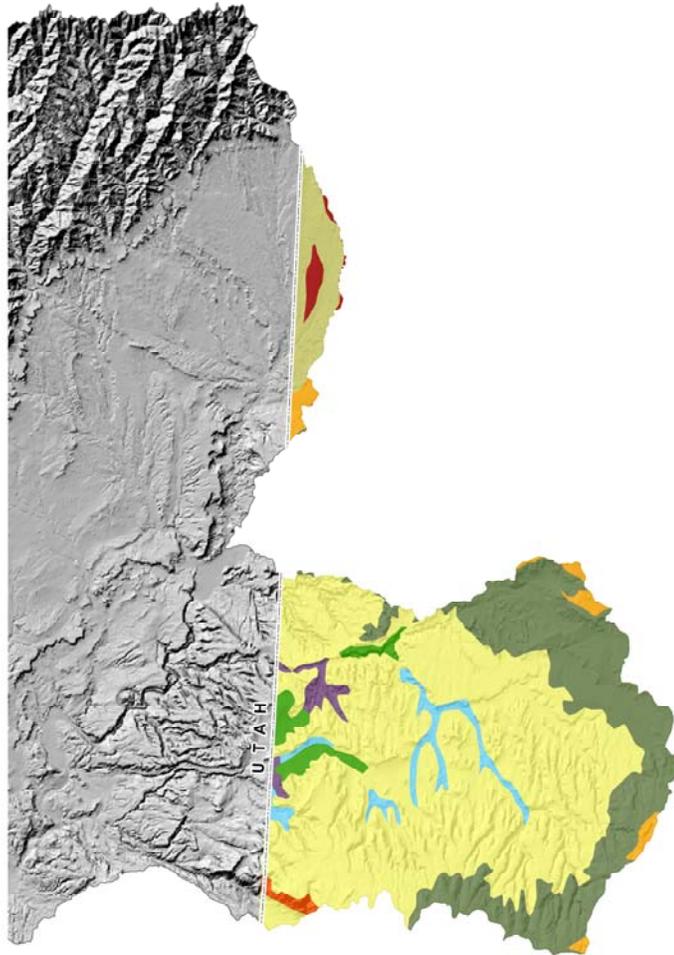


**The Wind Erodibility Index (WEI):** numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion if it is assumed there is no vegetative cover or management.

Soils with an erodibility index equal to or greater than 8 are considered highly erodible.







## Geology

- ◆ BIOTITIC GNEISS, SCHIST, AND MIGMATITE
- ◆ CUTLER FORMATION
- ◆ DAKOTA SANDSTONE AND BURRO CANYON FORMATION
- ◆ GRANITIC ROCKS OF 1,400-M.Y. AGE GROUP (AGE 1,350-1,480 M.Y.)
- ◆ GRANITIC ROCKS OF 1,700-M.Y. AGE GROUP (AGE 1,650-1,730 M.Y.)
- ◆ KAYENTA FORMATION, WINGATE SANDSTONE, AND CHINLE FORMATION
- ◆ MANCOS SHALE
- ◆ MODERN ALLUVIUM
- ◆ MORRISON FORMATION, SUMMERVILLE FORMATION (SHALE AND SILTSTONE), AND ENTRADA SANDSTONE
- ◆ OLDER GRAVELS AND ALLUVIUMS (PRE-BULL LAKE AGE)

### State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Westwater Canyon Watershed

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Birds	Concern/None	May occur in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Occurs in the watershed
Bonytail	<i>Gila elegans</i>	Fish	Endangered/Endangered	Critical habitat in the area
Burrowing Owl	<i>Athene cucularia</i>	Birds	Threatened/None	May occur in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	May occur in the watershed
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Fish	Threatened/Endangered	Critical habitat in the area
Colorado Roundtail Chub	<i>Gila robusta</i>	Fish	Concern/None	Occurs in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern/None	May occur in the watershed
Greenback/Colorado River Cutthroat Trout	<i>Oncorhynchus clarki stomia/pleuriticus*</i>	Fish	Threatened/Threatened	Occurs in the watershed
Gunnison Sage-grouse	<i>Centrocercus minimus</i>	Birds	Concern/None	Occurs in the watershed
Humpback Chub	<i>Gila cypha</i>	Fish	Threatened/Endangered	Critical habitat in the area
Kit Fox	<i>Vulpes macrotis</i>	Mammals	Endangered/None	Occurs in the watershed
Longnose Leopard Lizard	<i>Gambelia wislizenii</i>	Reptiles	Concern/None	Occurs in the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	May occur in the watershed
Midget Faded Rattlesnake	<i>Crotalus viridis concolor</i>	Reptiles	Concern/None	May occur in the watershed
Mountain Sucker	<i>Catostomus platyrhynchus</i>	Fish	Concern/None	
Northern leopard frog	<i>Rana pipiens</i>	Amphibians	Concern/None	Occurs in the watershed
Razorback Sucker	<i>Xyrauchen texanus</i>	Fish	Endangered/Endangered	Critical habitat in the area
River Otter	<i>Lontra Canadensis</i>	Mammals	Threatened/None	May occur in the watershed
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/None	May occur in the watershed
Uinta/Colorado Basin Hookless Cactus	<i>Sclerocactus glaucus</i>	Plants	None/Threatened	May occur in the watershed
Western Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Birds	Concern/Candidate	May occur in the watershed

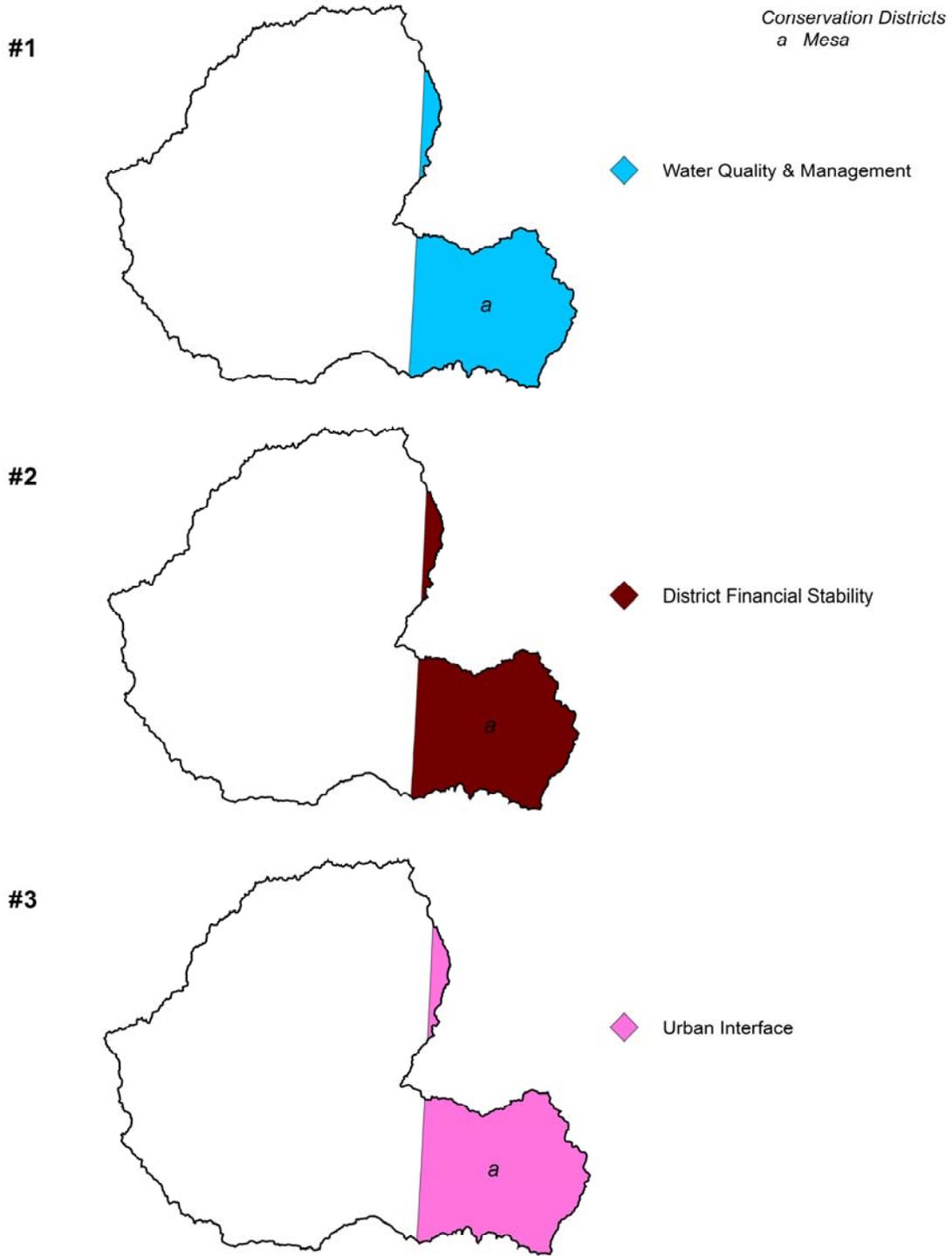
The terrestrial habitats in this watershed include small amounts of dry and irrigated cropland; desert shrub, saltbush, greasewood, oak, and big sagebrush shrub lands; and pinyon-juniper and aspen woodlands. Significant aquatic habitats are found in the streams and riparian and wetland areas in the watershed. These habitats provide food, cover, or water for many native species at some life stage.

Economically important species in the watershed include: black bear, elk, mule deer, mountain lion, and sport fish throughout most of the watershed; pronghorn in the northern part of the watershed, and wild turkey in the south part. Snow geese are found near this watershed along the Colorado River and associated riparian fields. Trout occur at higher elevations where water temperatures are cooler and warm-water fish at lower elevations.

Social Data	Mesa
<b>Demographics (US Census, American Factfinder)</b>	
Total population	126,588
Male	61,566
Female	65,022
Median age (years)	36.9
White	114,662
Black or African American	670
American Indian and Alaska Native	734
Asian	955
Native Hawaiian and Other Pacific Islander	161
Some other race	6852
Hispanic or Latino (of any race)	13718
<b>Economic Characteristics (US Census, American Factfinder)</b>	
In labor force (population 16 years and over)	66,835
Median household income (dollars)	39,487
Median family income (dollars)	46,858
Per capita income (dollars)	21,318
Families below poverty level	x
Individuals below poverty level	x
<b>County Agricultural Characteristics (Colorado Agricultural Census, county data tables)</b>	
Farms (number)	1599
Land in farms/ranches (acres)	385,255
Average size farm/ranch (acres)	241
Median size farm (acres)	24
Average age of farmer or rancher	55.2
Net cash return from ag sales (\$1,000)	4,746
Cattle and calves (number)	39,000

# Identified Long Range Resource Concerns

## Top Three Concerns within Conservation Districts



### Conservation Practices Applied, FY 2005 through FY 2009\*

Practice Code	Practice Name	Practice Unit	Applied Amount	Applied Count
442	Irrigation System, Sprinkler, Pasture and Hayland	ac	275	11
* Practices applied in Colorado portion of the watershed				

### Conservation Systems to Address Major Resource Concerns *from the Field Office Technical Guide*

Hayland—The Irrigation system is comprised of pipeline with side roll. The system efficiency is 65%.		CO 36.2-HY-Sideroll—R-1
<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
442 Irrigation System, Sprinkler	Cool season grasses, alfalfa, or alfalfa/grass hay. Annual precipitation ranges from 8 - 20". Moisture usually lacking in the summer during peak ET and supplemented with gravity irrigation, the water source may be ground or surface water; rainfall often comes in short intense spring and early summer storms and as snowfall in the winter. Wildlife potential for use by elk, deer and other wildlife.	Soil Erosion - Sheet and Rill
449 Irrigation Water Management		Soil Erosion - Wind
511 Forage Harvest Management		Water Quantity - Inefficient Water Use on Irrigated Land
587 Structure for Water Control		

### Estimated Costs of Application of Conservation Systems

Landuse	Estimated Acres Need to be Treated	Estimated Average Cost per Acre (\$)	Total Costs (\$)
Hayland	1,000	880	880,000
Total Estimated Costs:			\$880,000

---

## FOOTNOTES/ BIBLIOGRAPHY

**Threatened and Endangered Species** information was gathered using data from the Colorado Division of Wildlife (CDOW) Natural Diversity Information Source (NDIS). NDIS GIS data may be downloaded at <http://ndis.nrel.colostate.edu>. For more information on Colorado's Endangered & Threatened Species, as well as Species of Concern, visit <http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/ThreatenedEndangeredList/ListOfThreatenedAndEndangeredSpecies.htm> or <http://mountainprairie.fws.gov/endspp/CountyLists/COLORADO.htm>

**Resource Concerns** were identified using the Colorado Association of Conservation Districts' (CACD) long range (10 year) plans from the period of 1996-2000. Only the top three environmental resource concerns for each district were used. For more information on Colorado's Conservation Districts, visit <http://www.cacd.us>.

Maps were generated using Soil Survey Geographic Database (SSURGO) tabular and spatial data. SSURGO data was downloaded for the following Colorado & Utah surveys:

Mesa County Area (CO680) Published 01/06/2006

Uintah Counties (UT047) Published 11/14/2006

Grand County (UT624) Published 12/21/2006

Canyonlands Area (UT633) Published 1/1/2007

**Vegetation** data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. Completed in 2003, the CVCP is a landscape level vegetation dataset created using Landsat TM imagery and then formatted for GIS use. The species identified are an overview of the most common species associated in each cover type, in order of greatest occurrence. For more information on the Colorado Vegetation Classification Project, visit <http://ndis.nrel.colostate.edu/coveg>.

All border state (if applicable) vegetation data courtesy of the National Land Cover Dataset (NLCD). For more information visit [http://www.mrlc.gov/mrlc2k\\_nlcd.asp](http://www.mrlc.gov/mrlc2k_nlcd.asp)

**Common Resource Area** (CRA), a subdivision of the Major Land Resource Area (MLRA), is a geographical area where resource concerns, problems, or treatment needs are similar. Geographic boundaries of a CRA are determined by landscape conditions, soil, climate, human considerations and other natural resource information. For more information on Common Resource Areas visit <http://soils.usda.gov/survey/geography/cra.html>.

**Average Annual Precipitation** data was developed through a partnership between the Natural Resources Conservation Service's (NRCS) National Water and Climate Center (NWCC), the National Cartography and Geospatial Center (NCGC), and the PRISM (the Parameter-elevation Regressions on Independent Slopes Model) group at Oregon State University (OSU), developers of PRISM. Mean annual precipitation maps were developed calculating averages of rainfall for the period of 1961-1990. For more information on PRISM data visit <http://www.ncgc.nrcs.usda.gov/products/datasets/climate/docs/fact-sheet.html> or for more information about technical aspects of PRISM, visit the PRISM website at <http://www.ocs.orst.edu/prism>.

**Land Ownership** (status,07/22/2006 dataset) data was obtained from the Bureau of Land Management, Colorado State Office. For more information, visit [http://www.blm.gov/co/st/en/BLM\\_Programs/geographical\\_sciences/gis.html](http://www.blm.gov/co/st/en/BLM_Programs/geographical_sciences/gis.html)

**Relief & Elevation** maps were created using the National Elevation Dataset (NED), 30m Digital Elevation Model (DEM) raster product assembled by the U.S. Geological Survey (USGS). A hillshade grid was created from the 30m DEM to create a 3D effect. For more information about the NED visit <http://ned.usgs.gov>. The data was downloaded from the NRCS Geospatial Data Gateway at <http://datagateway.nrcs.usda.gov>.

**Forest Insect & Disease** data obtained from the U.S. Forest Service annual aerial survey. For more information visit <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>