United States Department of Agriculture

Natural Resources Conservation Service

Lakewood, Colorado

RWA 14010005

December 2008

Colorado Headwaters-Plateau Watershed

Hydrologic Unit Code 14010005

Rapid Assessment

Satellite Imagery: ArcIMS Server - Geographic Network Services hosted by ESRI

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.

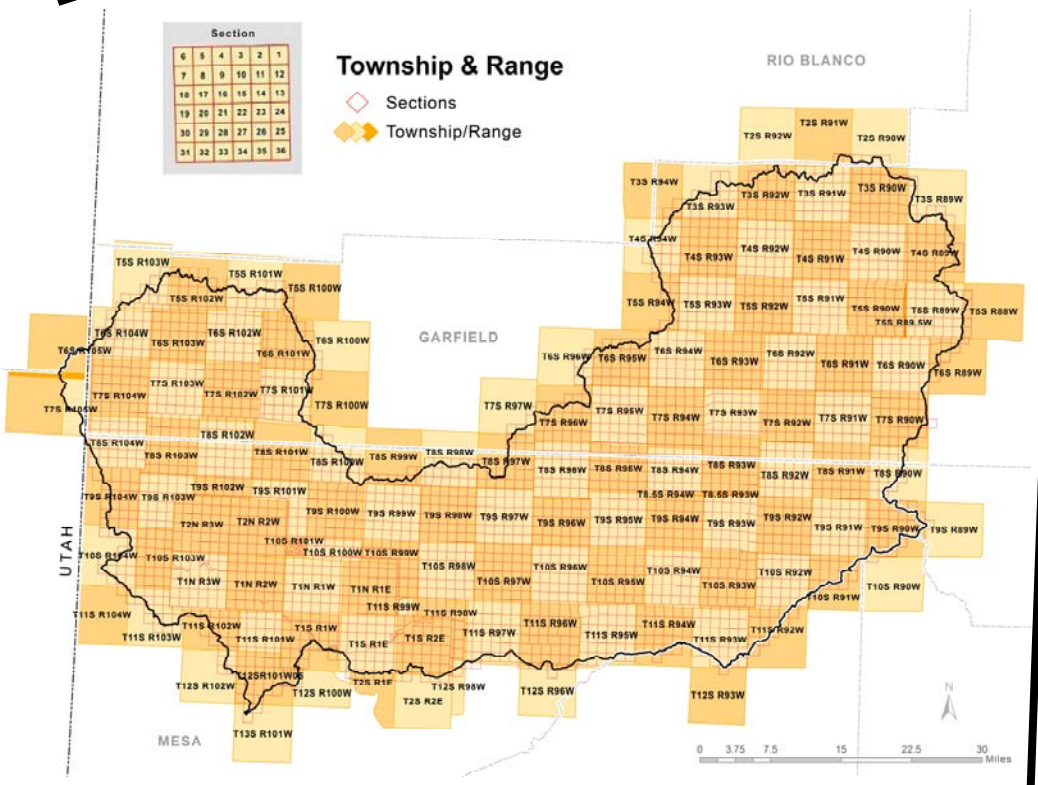
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best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

Benefits of these Activities

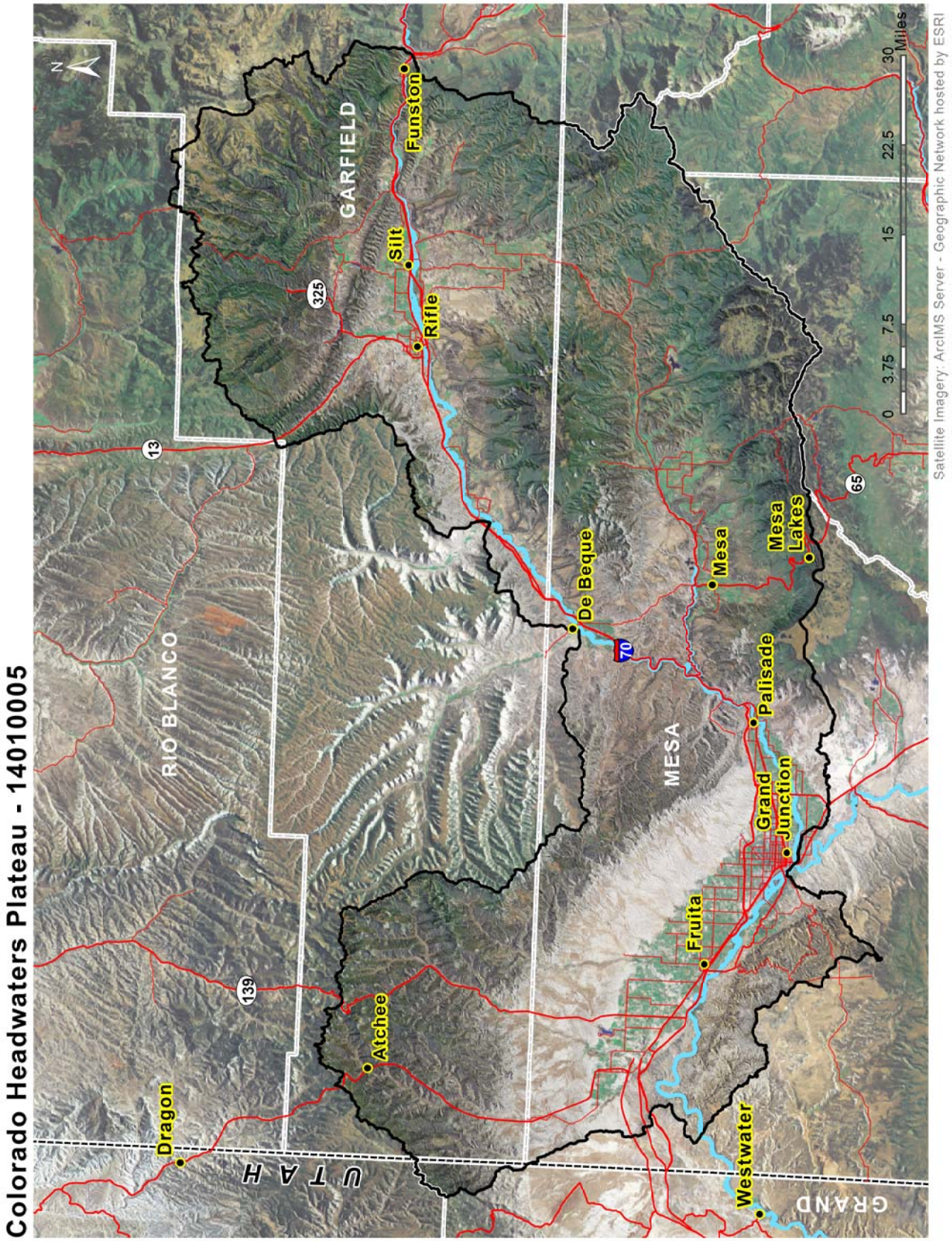
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

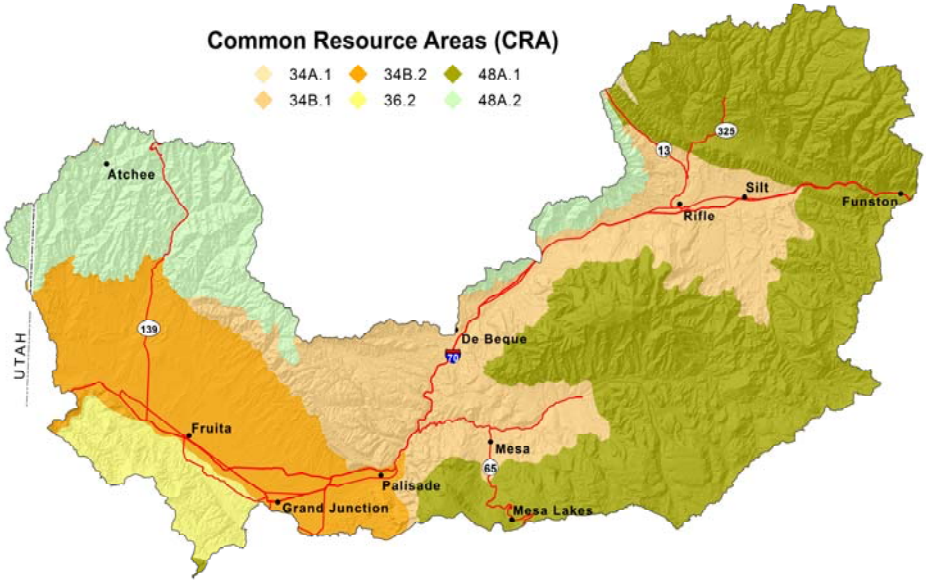
Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

- 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)



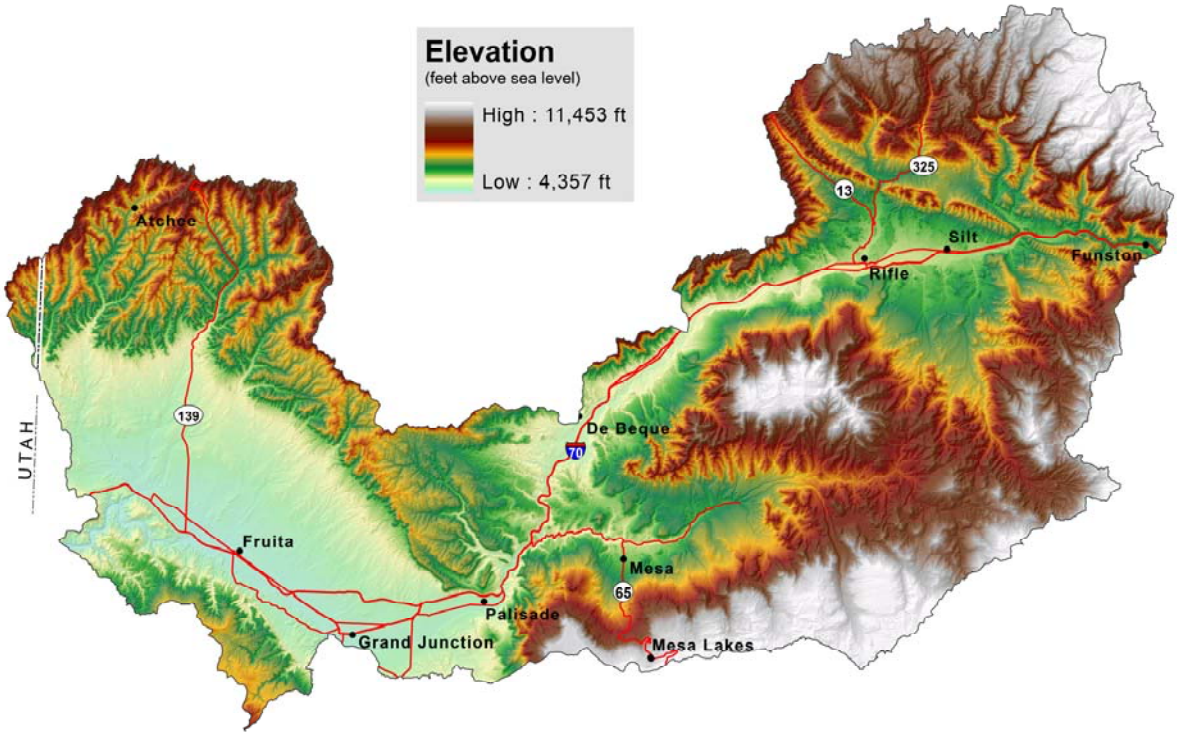
COLORADO County	County Acres	County Acres in COLORADO HEADWATERS PLATEAU Watershed	% of County in the Watershed	% of Watershed in the County
Garfield	1,893,185	870,115	46.0%	44.5%
Mesa	2,140,856	1,070,219	50.0%	54.8%
Rio Blanco	2,064,890	1,968	0.1%	0.1%
UTAH				
Grand	2,369,882	10,697	0.5%	0.5%
		1,953,150		


Colorado Headwaters Plateau - 14010005
N
GARFIELD
Funston
Silt
Rifle
325
13
RIO BLANCO
De Beque
70
MESA
Mesa
Mesa Lakes
65
Palisade
Grand Junction
Fruita
Atchee
139
Dragon
UTAH
Westwater
GRAND
0 3.75 7.5 15 22.5 30 Miles
Satellite Imagery: ArcIMS Server - Geographic Network hosted by ESRI

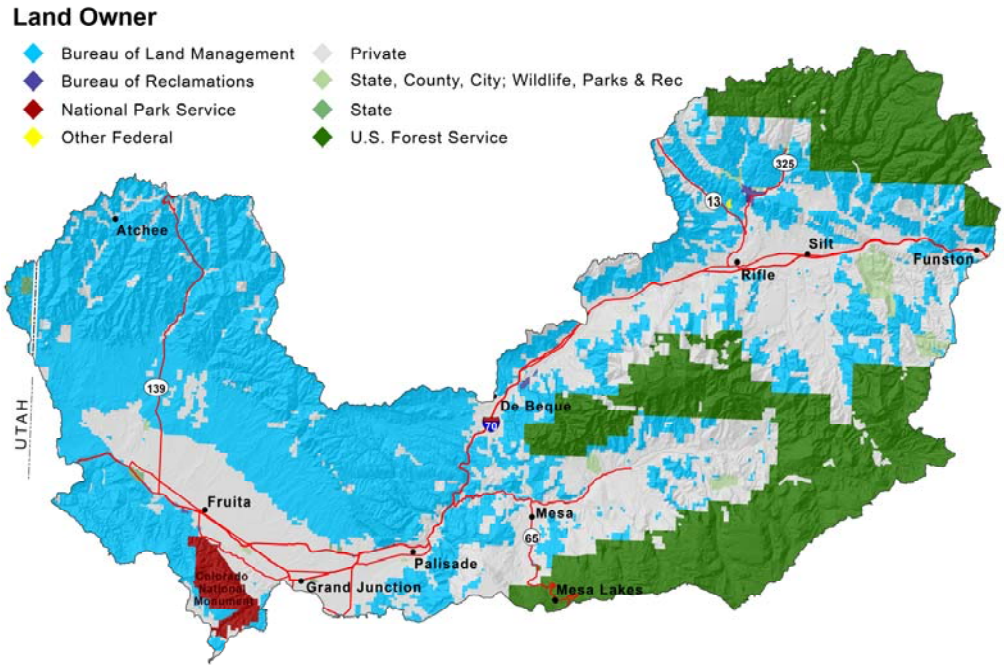


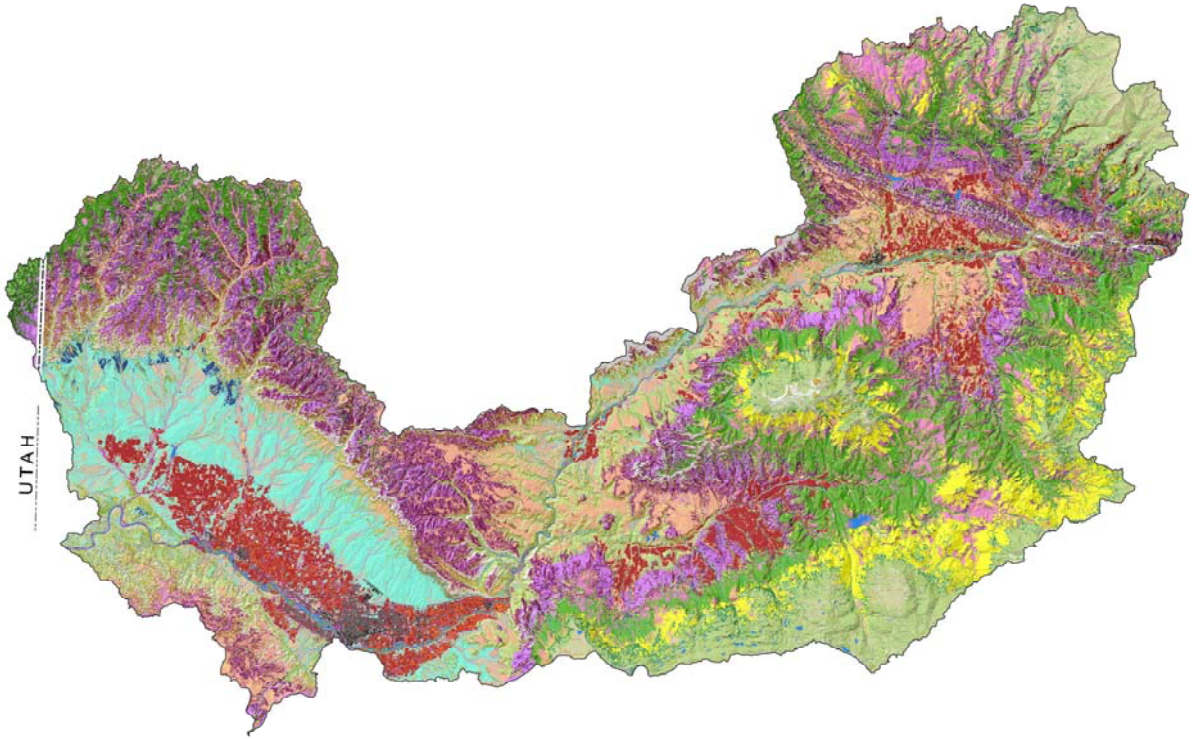
CRA: A geographical area where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

MLRA	CRA	CRA NAME	CRA DESCRIPTION
34A	34A.1	Cool Central Desertic Basins and Plateaus--Green River Basin	This unit is in the cool semiarid basins, plateaus, and low mountains that are west of the Continental Divide in MLRA 34A. Soils have an aridic moisture regime and frigid temperature regime. Vegetation is sagebrush or shadscale and bunchgrasses. Major use is range. Precipitation ranges from 7 to 14 inches. Elevations range from about 4,000 to 7,000 feet.
34B	**34B.1**	Warm Central Desertic Basins and Plateaus - Semiarid Plateaus and Low Mountains	This area is on broad plateaus and in narrow saline basins in Colorado and Utah. Soils have an aridic moisture regime and a mesic temperature regime. Natural vegetation is typically big sagebrush and bunchgrasses. Major use is range. Precipitation ranges from 5 to 16 inches. Elevations range from about 4,500 to 6,000 feet.
34B	**34B.2**	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	**36.2**	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	**48A.1**	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.
48A	**48A.2**	Southern Rocky Mountains - Semiarid High Plateaus, Utah and Colorado	This area is a dissected high plateau. The temperature regime is frigid or cryic, and the moisture regime is ustic. Characteristic native vegetation is sagebrush, aspen, and Rocky Mountain Douglas fir. Elevations range from 5,000 to 9,500 feet.



Bureau of Land Management	827,261
Bureau of Reclamation	1,957
National Park Service	20,453
Other Federal	222
Private	627,029
State	1,430
State, County, City; Wildlife, Parks & Rec	18,953
U.S. Forest Service	445,128





Vegetation

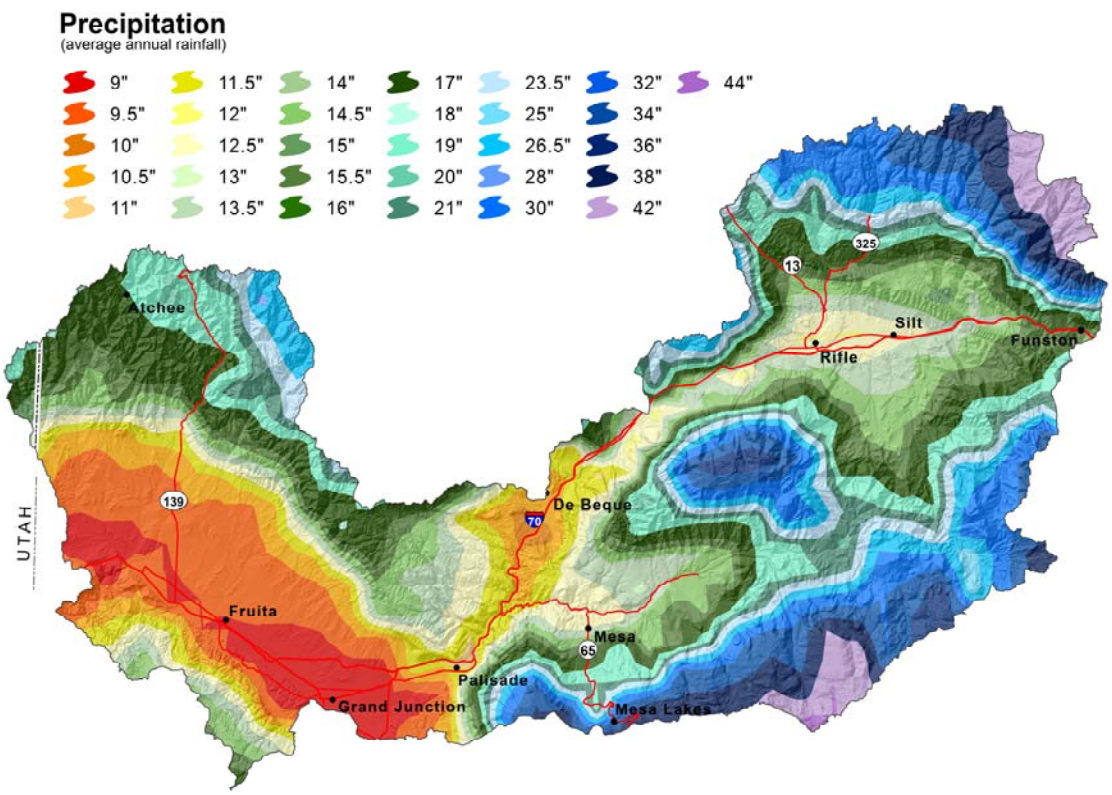
COLORADO - CVCP

- No Data
- Agriculture Land
- Alpine Forb Dominated
- Alpine Grass/Forb Mix
- Alpine Meadow
- Aspen
- Aspen/Mesic Mountain Shrub Mix
- Barren Land
- Commercial
- Conifer Riparian
- Cottonwood
- Disturbed Rangeland
- Douglas Fir
- Douglas Fir/Aspen Mix
- Douglas Fir/Englemann Spruce Mix
- Dryland Ag
- Englemann Spruce/Fir Mix
- Exotic Riparian Shrubs
- Fir/Lodgepole Pine Mix
- Foothill and Mountain Grasses
- Forb Dominated
- Forested Riparian
- Gambel Oak
- Grass Dominated
- Grass/Forb Mix
- Grass/Forb Rangeland
- Greasewood
- Herbaceous Riparian
- Irrigated Ag
- Juniper
- Juniper/Sagebrush Mix
- Lodgepole Pine
- Lodgepole Pine/Aspen Mix
- Lodgepole/Spruce/Fir Mix
- Mesic Mountain Shrub Mix
- P. Pine/Gambel Oak Mix
- Orchard
- PJ-Mtn Shrub Mix
- PJ-Oak Mix
- PJ-Sagebrush Mix
- Pinon-Juniper
- Ponderosa Pine
- Rabbitbrush/Grass Mix
- Residential
- Riparian
- Rock
- Sagebrush Community
- Sagebrush/Grass Mix
- Sagebrush/Greasewood
- Sagebrush/Mesic Mtn Shrub Mix
- Sagebrush/Rabbitbrush Mix
- Saltbush Community
- Sedge
- Serviceberry/Shrub Mix
- Shrub Riparian
- Shrub/Brush Rangeland
- Shrub/Grass/Forb Mix
- Snakeweed
- Snakeweed/Shrub Mix
- Snowberry
- Snowberry/Shrub Mix
- Soil
- Sparse Juniper/Shrub/Rock Mix
- Sparse PJ/Shrub/Rock Mix
- Spruce/Fir Regeneration
- Spruce/Fir/Aspen Mix
- Spruce/Fir/Lodgepole/Aspen Mix
- Sub-Alpine Fir
- SubAlpine Shrub Community
- Subalpine Grass/Forb Mix
- Subalpine Meadow
- Talus Slopes & Rock Outcrops
- Upland Willow/Shrub Mix
- Urban/Built Up
- Water
- Willow
- Xeric Mountain Shrub Mix

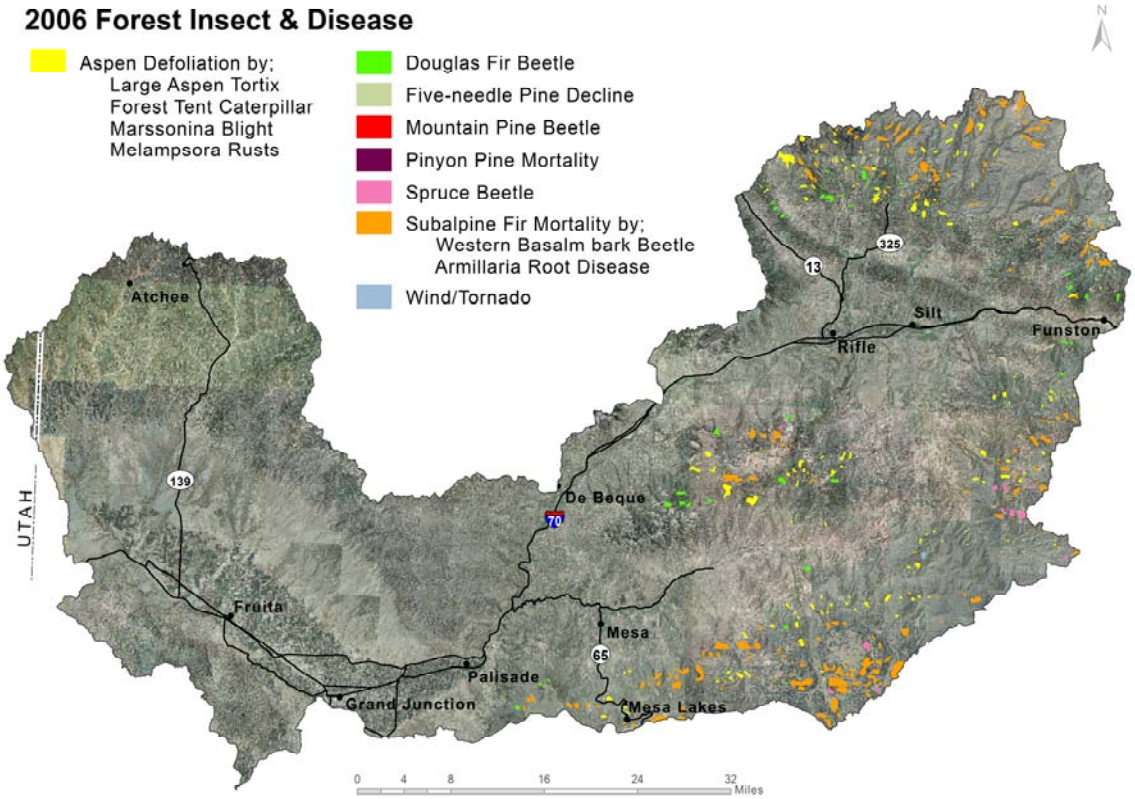
UTAH - NLCD

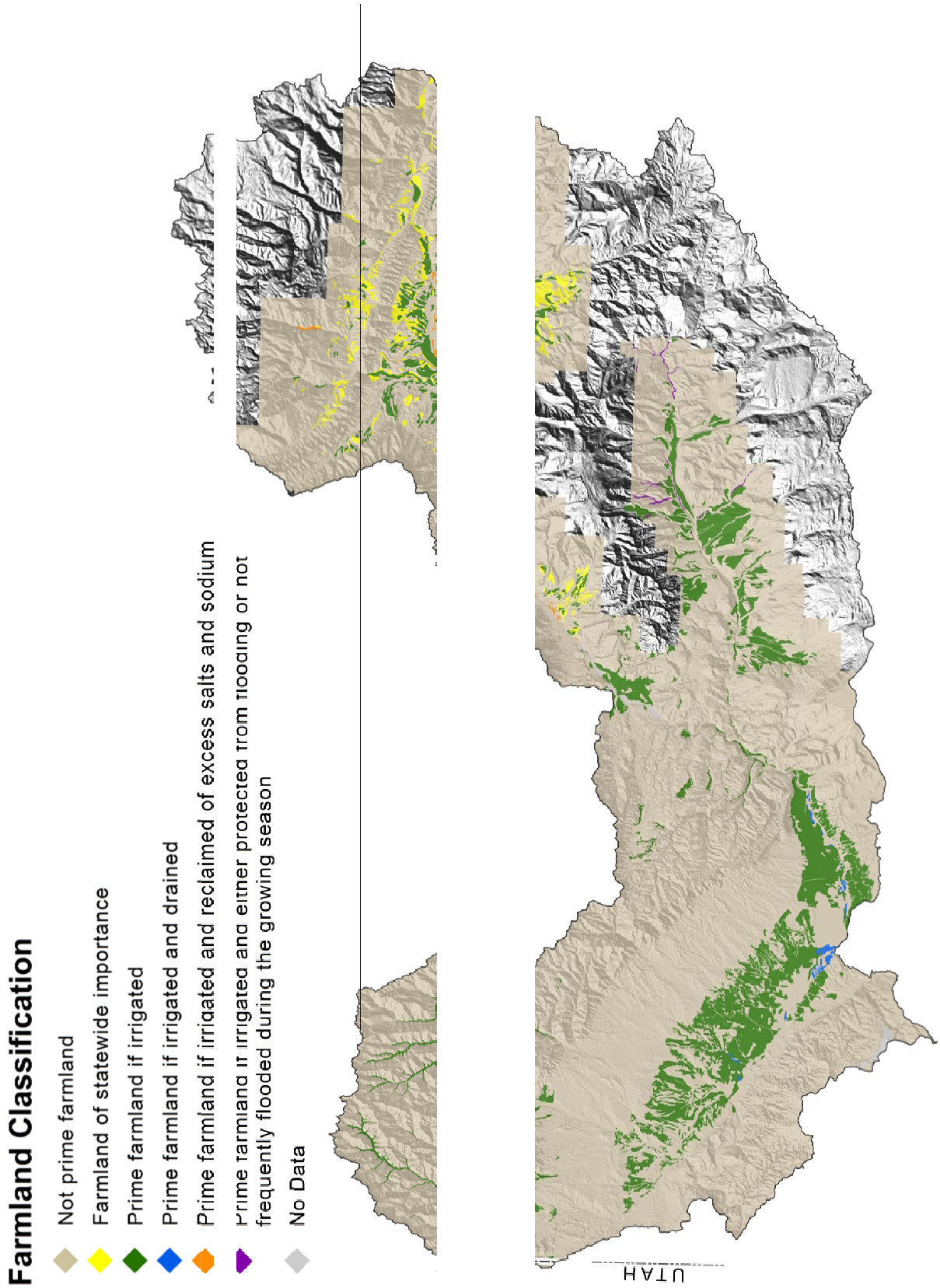
- Commercial/Industrial/Transportation
- Bare Rock/Sand/Clay
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrubland
- Grasslands/Herbaceous

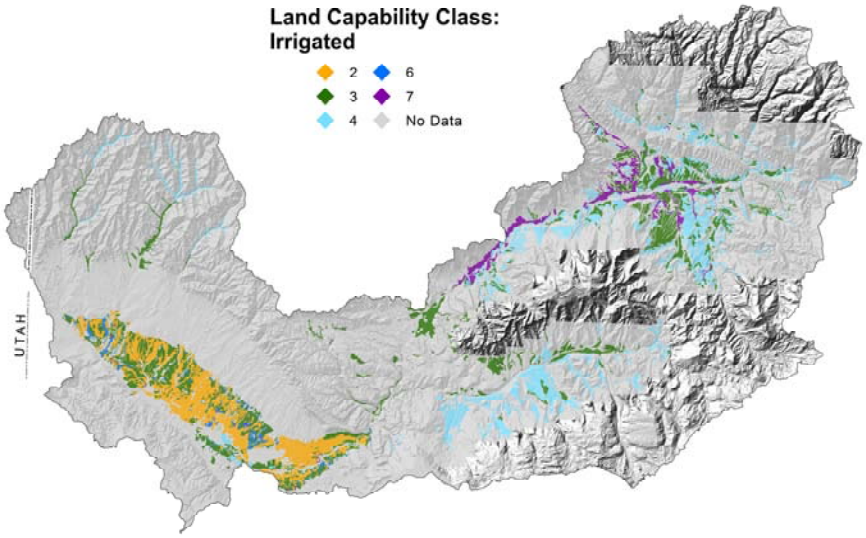
COLORADO HEADWATERS PLATEAU Colorado Land Use	Acreage
Agricultural Homesteads	54.9
Dryland Ag	5,891.6
Irrigated Ag	106,163.4
Orchard	9,030.5
Rangeland/Grassland	1,325,767
Forest	361,436
Riparian	20,659
Water	7,733.2
Barren Land	73.6
Commercial	7,593.6
No Data	92.1
Residential	7,925.7
Rock	2,368.7
Soil	5,082.9
Talus Slopes & Rock Outcrops	82,738.1
Urban/Built Up	194.3
Total Colorado Watershed Acres	**1,942,804**
COLORADO HEADWATERS PLATEAU Utah Land Use	**Acreage**
Rangeland/Grassland	3,398
Forest	6,687
Other	25
Total Utah Watershed Acres	**10,110**

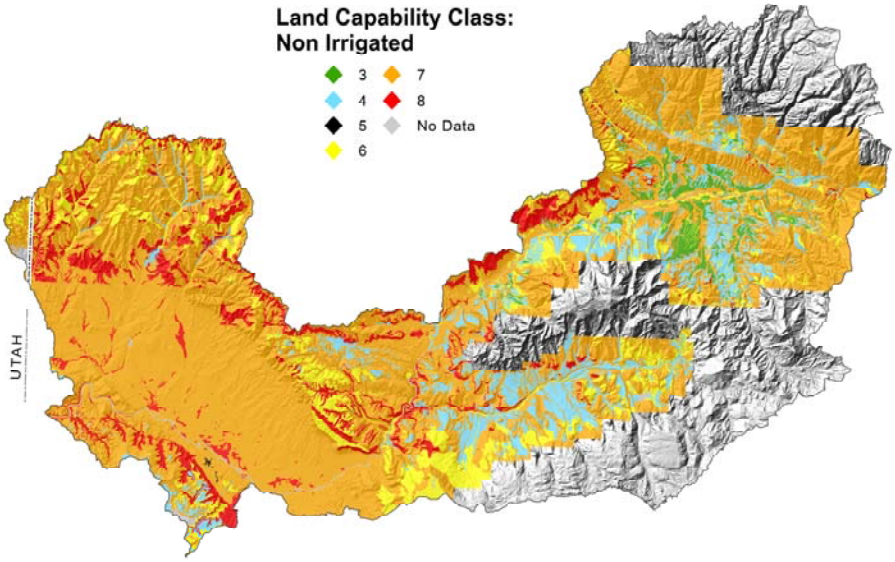


Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series 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.




Farmland Classification
Not prime farmland
Farmland of statewide importance
Prime farmland if irrigated
Prime farmland if irrigated and drained
Prime farmland if irrigated and reclaimed of excess salts and sodium
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
No Data
UTAH





Land Capability Classes

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.

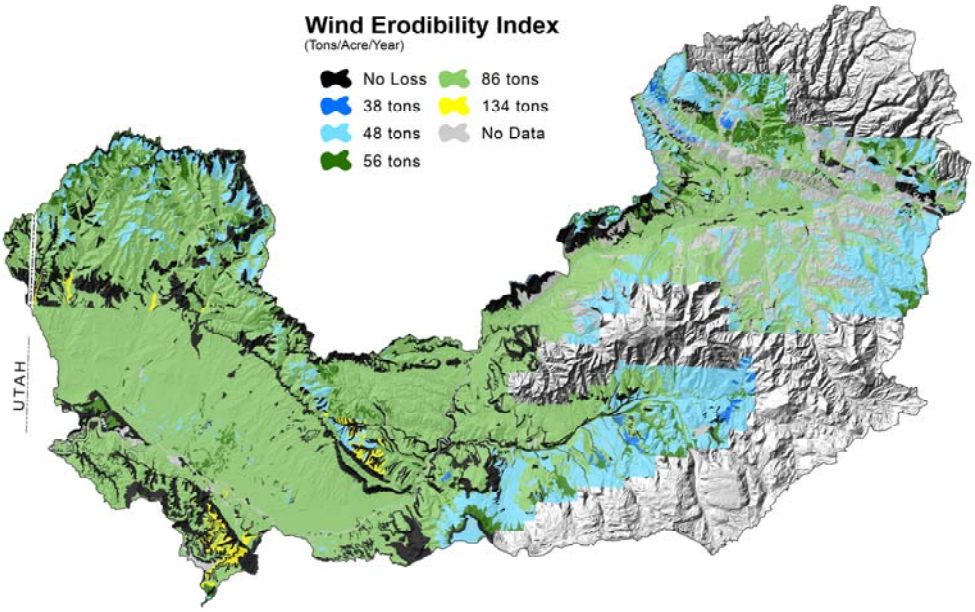
Class 5 - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

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.

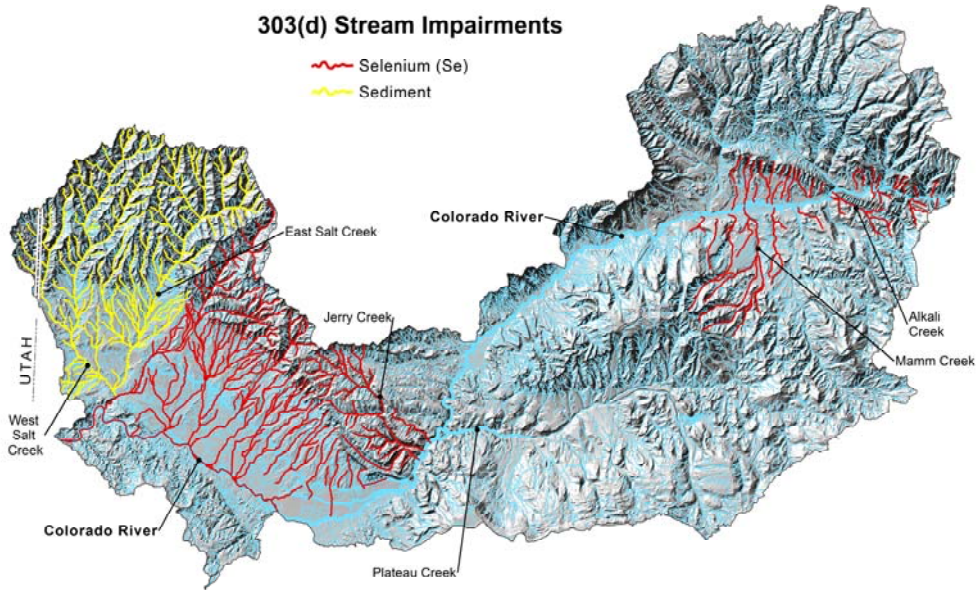


Soils with an erodibility index equal to or greater than 8 are considered highly erodible.

As shown on the Wind Erodibility Index map below, most cropland soils in the Colorado Headwaters-Plateau Watershed are considered highly erodible.

Stream Impairments

Section 303(d) of the Clean Water Act requires states to identify and list all water bodies where state water quality standards are not being met. Thereafter, TMDLs compromising quantitative objectives and strategies have been or will be developed for these impaired waters within the watershed in order to achieve their water quality standards.



Impairment Definition

Selenium: A naturally occurring metal in marine shale that serves as a micronutrient. Excessive amounts impair aquatic life and bioaccumulation up the food chain occurs causing toxicity to birds, mammals, and humans.

Social Data

	Garfield	Mesa	Rio Blanco
Demographics (US Census, American Factfinder)			
Total population	43,791	126,588	5,986
Male	22,489	61,566	3,021
Female	21,302	65,022	2,965
Median age (years)	34.2	36.9	37.5
White	39,394	114,662	5,687
Black or African American	196	670	11
American Indian and Alaska Native	310	734	46
Asian	191	955	17
Native Hawaiian and Other Pacific Islander	35	161	0
Some other race	2861	6852	121
Hispanic or Latino (of any race)	7300	13718	296
Economic Characteristics (US Census, American Fact-finder)			
In labor force (population 16 years and over)	23,562	66,835	3,143
Median household income (dollars)	47,016	39,487	37,711
Median family income (dollars)	53,840	46,858	44,425
Per capita income (dollars)	21,341	21,318	17,344
Families below poverty level	522	x	112
Individuals below poverty level	3206	x	556
X means that value is not applicable or not available			
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)			
Farms (number)	499	1599	245
Land in farms/ranches (acres)	404,335	385,255	376,509
Average size farm/ranch (acres)	810	241	1,537
Median size farm (acres)	110	24	305
Average age of farmer or rancher	54	55.2	56.5
Net cash return from ag sales ($1,000)	-1,364	4,746	2,081
Cattle and calves (number)	22,000	39,000	21,000

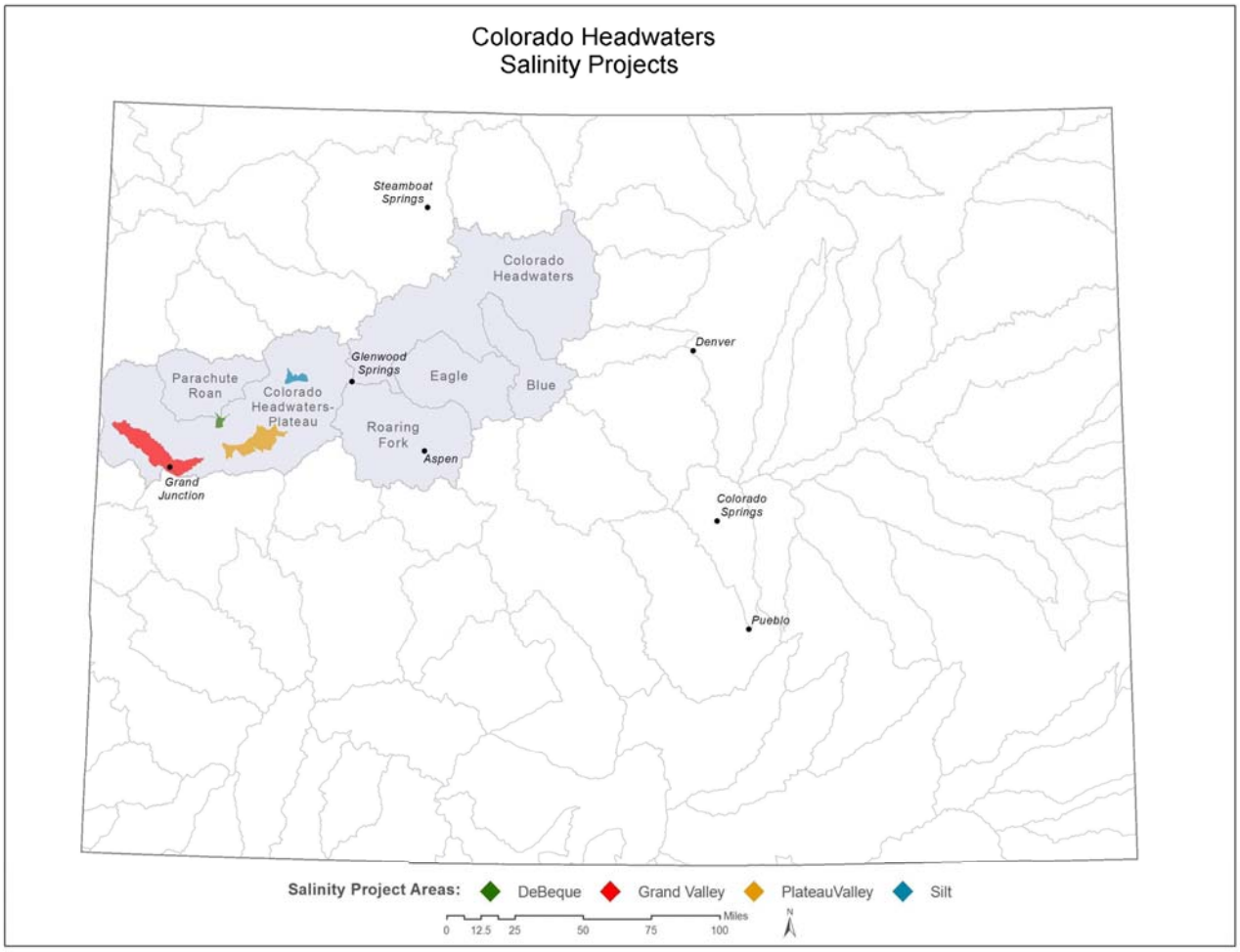
State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Colorado Headwaters Plateau Watershed

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
American Peregrine Falcon	*Falco peregrinus anatum*	Birds	Concern/None	Occurs in the watershed
Bald Eagle	*Haliaeetus leucocephalus*	Birds	Threatened/None	Winters and nests near the Colorado River in the watershed
Bonytail	*Gila elegans*	Fish	Endangered/Endangered	Critical habitat in the watershed
Boreal toad	*Bufo boreas*	Amphibians	Endangered/None	May occur in the watershed
Brassy Minnow	*Hybognathus hankinsoni*	Fish	Threatened/None	May occur in the watershed
Burrowing Owl	*Athene cunicularia*	Birds	Threatened/None	Occurs in the watershed
Canada Lynx	*Lynx canadensis*	Mammals	Endangered/Threatened	May occur in the watershed
Colorado Pikeminnow	*Ptychocheilus lucius*	Fish	Threatened/Endangered	Critical habitat in the watershed
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*	Fish	Concern/None	Occurs in the watershed
Colorado Roundtail Chub	*Gila robusta*	Fish	Concern/None	Occurs in the watershed
DeBeque Phacelia	*Phacelia submutica*	Plants	None/Candidate	May occur in the watershed
Ferruginous Hawk	*Buteo regalis*	Birds	Concern/None	Occurs in the watershed
Greater Sandhill Crane	*Grus canadensis tabida*	Birds	Concern/None	May occur in the watershed
Humpback Chub	*Gila cypha*	Fish	Threatened/Endangered	Critical habitat in the watershed
Kit Fox	*Vulpes macrotis*	Mammals	Endangered/None	Occurs in the watershed
Longnose Leopard Lizard	*Gambelia wislizenii*	Reptiles	Concern/None	Occurs in the watershed
Mexican Spotted Owl	*Strix occidentalis lucida*	Birds	Threatened/Threatened	May occur in the watershed
Midget Faded Rattlesnake	*Crotalus viridis concolor*	Reptiles	Concern/None	May occur in the watershed
Northern leopard frog	*Rana pipiens*	Amphibians	Concern/None	Occurs in the watershed
Razorback Sucker	*Xyrauchen texanus*	Fish	Endangered/Endangered	Critical habitat in the watershed
River Otter	*Lontra Canadensis*	Mammals	Threatened/None	Occurs in the watershed
Townsend's big-eared bat (pale ssp)	*Corynorhinus townsendii pallescens*	Mammals	Concern/None	Occurs in the watershed
Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	Plants	None/Threatened	Occurs in the watershed
Western Yellow-billed Cuckoo	*Coccyzus americanus*	Birds	Concern/Candidate	May occur in the watershed

The terrestrial habitats in this watershed include irrigated cropland; desert shrub and grassland; foothills, montane, and sub-alpine shrub and forest including aspen and mixed conifer forest, and saltbush, big sagebrush, and pinyon-juniper shrublands. Significant aquatic habitats are found on the Grand Mesa, the Colorado River, and in other 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; moose in the southeastern part of the watershed; and pronghorn in the western part of the watershed in lower elevation cropland, shrubs, and grasslands. Snow geese make use of the Colorado River and associated riparian fields. Trout occur at higher elevations where water temperatures are cooler and warm-water fish at lower elevations. The watershed also supports a few populations of bighorn sheep and wild turkey.

Natural Resource Concerns



From NRCS Field Office Survey *July 2008*

Water Quality

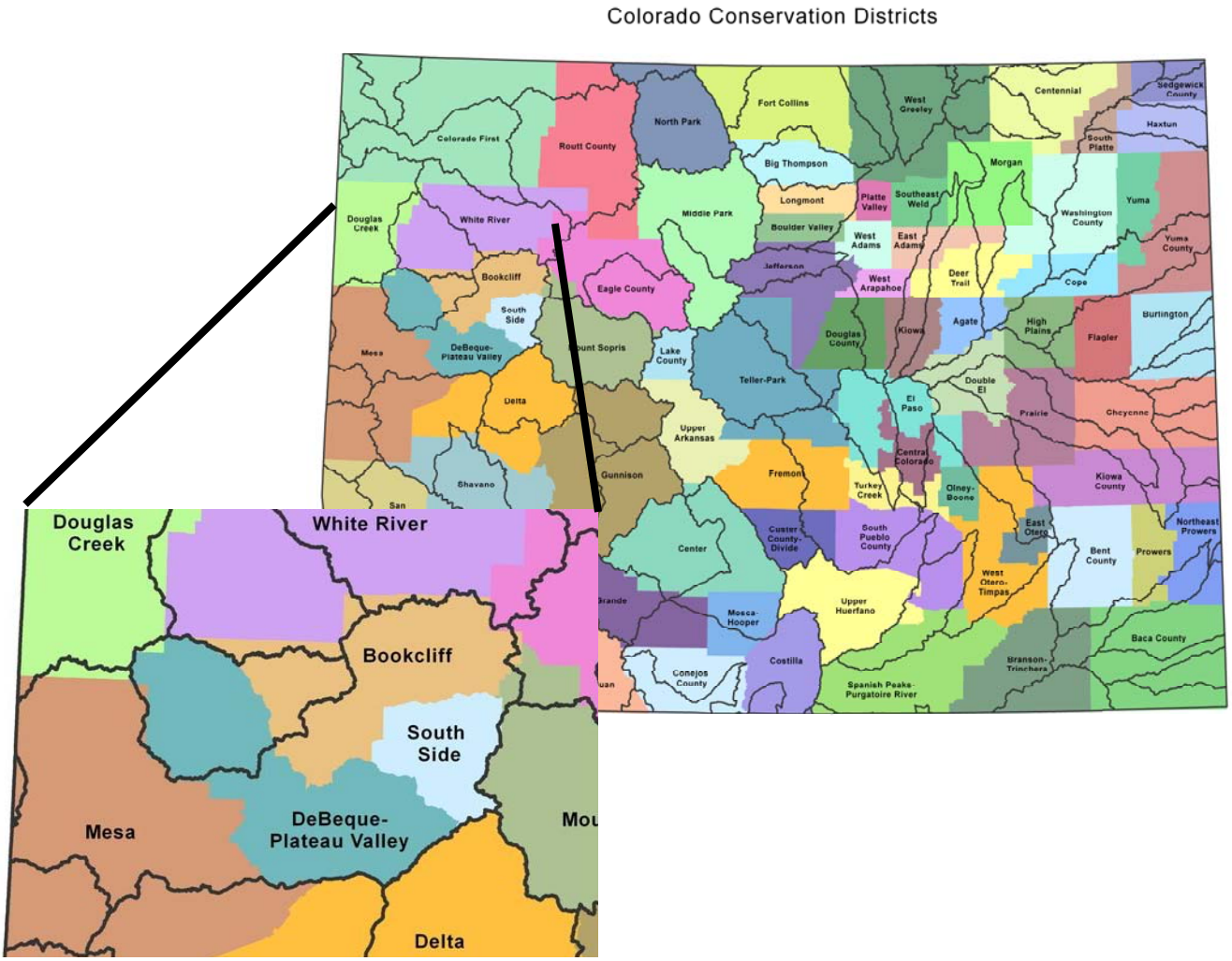
Water Quantity

Range Health

Plants—Noxious Weeds

Wildlife Management

Natural Resource Concerns, continued



Colorado Headwaters— Plateau Watershed

Conservation District's Natural Resource Concerns, *extracted from their Long Range Plans*

	Mesa	DeBeque-Plateau Valley	South Side	Bookcliff	Total
Water Quality and Quantity	5	5	2	4	16
Noxious Weeds	3	4	5	3	15
Range Health	2	2			4
Agriculture Sustainability			3		3
Urban/Rural Interface	4	3	4		11

Selected Conservation Application Data

Colorado Headwaters-Plateau Watershed 14010005

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	7,163	20,612	Not Avail.	13,482	16,034	15,736	73,027
Total Conservation Systems Applied (Acres)	2,090	20,369	Not Avail.	27,008	4,436	9,012	62,915
Practices							
Prescribed Grazing	92	18,776	3,116	20,062	0	0	42,046
Upland Wildlife Habitat Management	1,247	142	834	2,197	323	5	4,748
Conservation Cropping System	Not Avail.	Not Avail.	658	798	569	770	2,795
Irrigation Water Management	68	11	658	364	989	770	2,860

Conservation Systems to Address Major Resource Concerns

Primary Resource Concern: **Rangeland Health**

Conservation System Description: Prescribed Grazing—planned management that provides adequate recovery opportunity between grazing events and proper stocking of animals. Estimate 55,000 acres need to be treated on median sized ranches of 400 acres.

Based on Conservation System Guide Code: CO 48A.1-GR-01-R-Grazing

Practices	Unit	Quantity	Cost/Unit ($)	Estimated Cost per Median Sized Ranch ($)
Prescribed Grazing				
Fence (382)	Ft.	3,100	1.60	4,960
Pest Management (595)	Ac.	300	15.00	4,500
Pipeline (516)	Ft.	2,000	3.40	6,800
Upland Wildlife Habitat Management (645)	Ac.	200	na	
Irrigation Water Management	Ac.	85	850.00	51,850
Watering Facility (614)	No.	2	610	1,220
Costs to apply prescribed grazing per median sized ranch of 400 acres	No.	138	69,330	9,567,540
			Subtotal Rangeland costs:	**$9,567,540**

Conservation Systems to Address Major Resource Concerns (cont'd)

Conservation System Description:	Surface irrigation converted to more efficient systems with IWM, Nutrient and Pest Mgt.			**Reference Conservation System Guide Code:** CO 48A-CR-R-2
Practices	**Unit**	**Quantity**	**Cost/Unit ($)**	**Estimated Cost ($)**
Irrigation Water Management (449)	Ac	24,000	1200	28,800,000
Nutrient Management (590)	Ac	24,000	5	120,000
Pest Management (595)	Ac	24,000	15	360,000
			Subtotal Irrigated Crops:	**29,280,000**

General Effects, Impacts, and Estimated Costs of Application of Conservation Systems

Landuse	**Resource Concern**	**Measurable Effects**	**Non-measurable Effects**	**Estimated Cost ($)**
Rangeland	Plants		Improved plant condition, productivity, health and vigor. Grazing animals have adequate feed, forage, and shelter. Wildlife habitat is sustained or improved.	9,567,540
Dryland Crop	Water Quality		Improved water use	29,280,000
			Estimated Total Costs to Address Major Resource Concerns:	**$38,847,540**

References Not Cited in Document

303(d) listed streams were created using data from Colorado Department of Public Health & Environments' Water Quality & Control Commission. Impaired streams are current as of April 30, 2006. For a list of all Colorado impaired streams, locations and priority ratings, visit http://www.cdphe.state.co.us/regulations/wqccregs/100293wqlimitedsegtmdls.pdf.

Threatened and Endangered Species information was gathered using data from the Colorado Division of Wildlife (CDOW) Natural Diversity Information Source (NDIS).

Resource Concerns were identified using the Colorado Association of Conservation Districts' (CACD) long range (10 year) plans from the period of 1996-2000. 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 surveys:

Mesa County Area (CO680) Published 01/06/2006
Rifle Area (CO683) Published 01/10/2007
Grand County, UT (UT624) Published 12/21/2006
Douglas-Plateau Area (CO682) Published 12/05/2006
Rio Blanco County Area (CO685) Published 01/11/2006

Vegetation data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. visit http://ndis.nrel.colostate.edu/coveg.

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. 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 visit http://www.ncgc.nrcs.usda.gov/products/datasets/climate/docs/fact-sheet.html or http://www.ocs.orst.edu/prism.

Land Ownership (status, 2004 dataset) data was obtained from the Colorado Department of Transportation (CDOT). For more information, visit http://www.dot.state.co.us.

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). The data was downloaded from the NRCS Geospatial Data Gateway at http://datagateway.nrcs.usda.gov.

Conservation Systems to address major resource concerns were extracted from the Conservation Systems Guides (CSG) compiled from local conservationists by the NRCS Ecological Sciences Section at the Lakewood State Office.

Effects and Impacts of application of conservation systems were extracted from Colorado eFOTG, Section III, Resource Quality Criteria, NRCS, Colorado, March 2005.

.