



United States Department
of Agriculture



Natural Resources
Conservation Service

Lakewood, Colorado

RWA 14010001

January 2009

Colorado Headwaters Watershed

Hydrologic Unit Code 14010001

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.

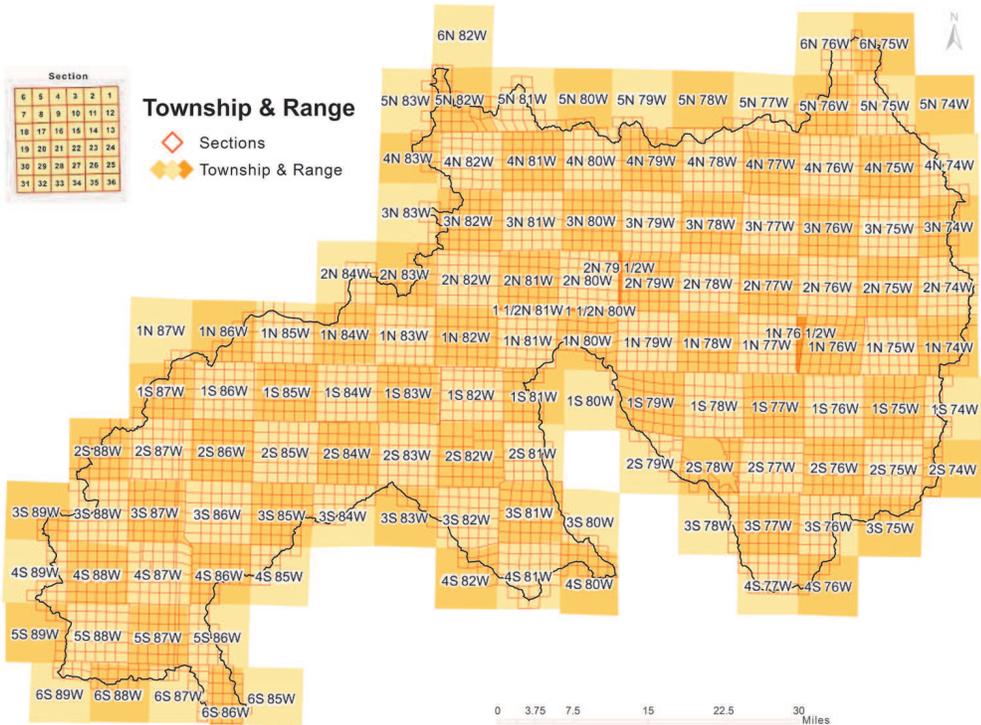
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best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

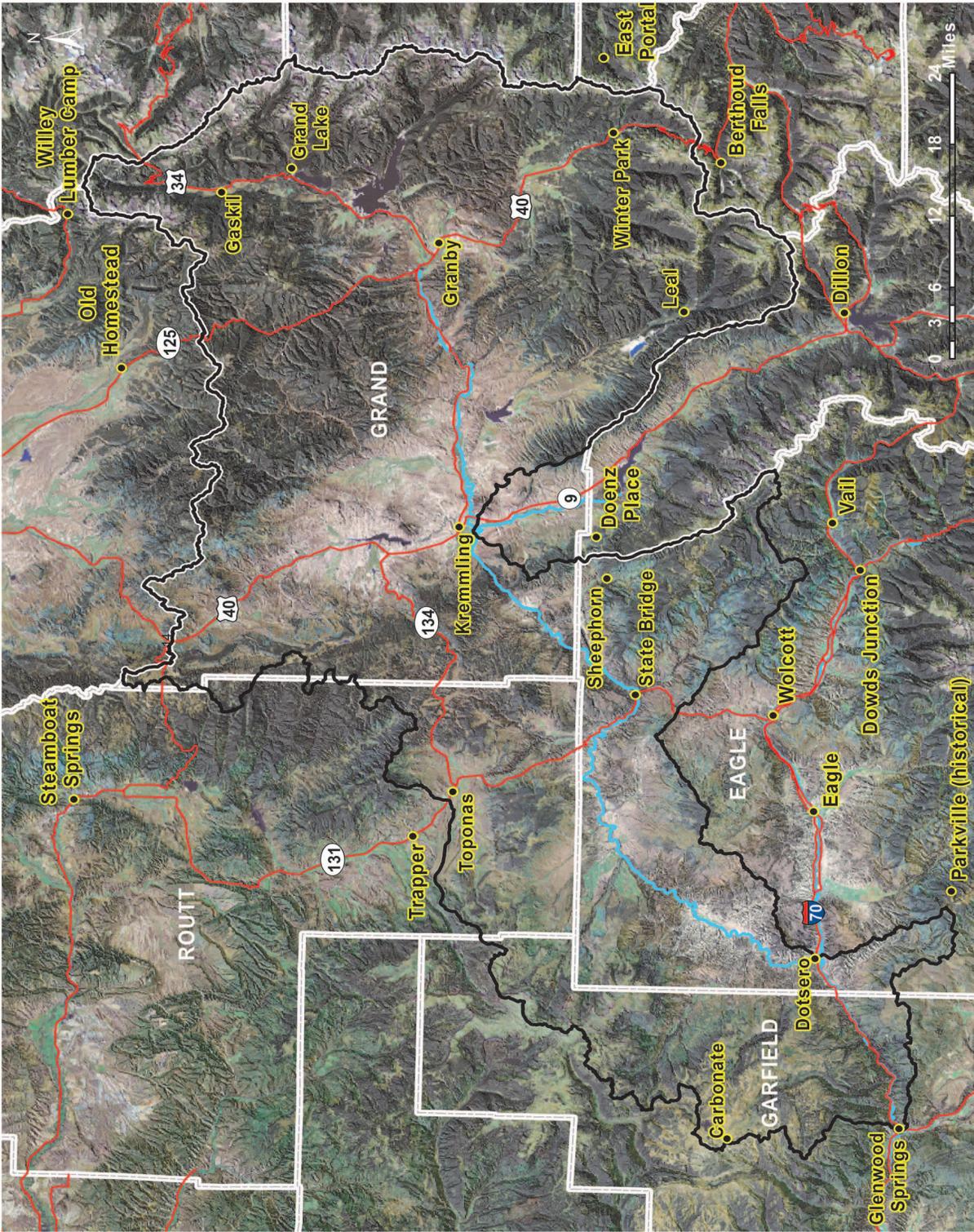
- Quick and inexpensive tools for setting priorities and taking action
- Providing a level of detail that is sufficient for identifying actions that can be taken with no further watershed-level studies or analyses
- Actions to be taken may require further Federal or State permits or ESA or NEPA analysis 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.



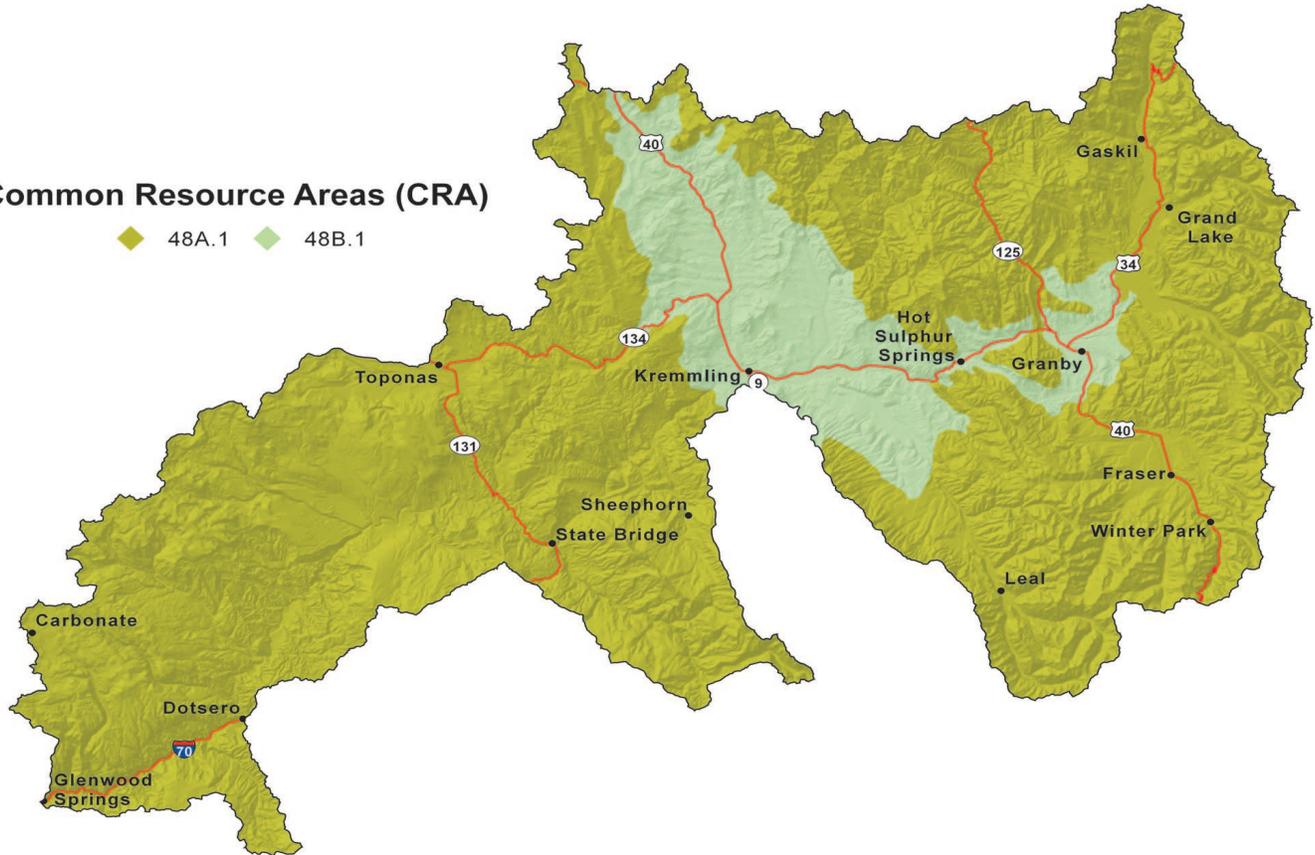
County	County Acres	County Acres in COLORADO HEADWATERS Watershed	% of County in the Watershed	% of Watershed in the County
Eagle	1,084,004	336,155	31.0%	18.1%
Garfield	1,893,489	201,488	10.6%	10.9%
Grand	1,195,555	1,150,220	96.2%	62.0%
Routt	1,516,045	167,980	11.1%	9.0%
		1,856,401		

Colorado Headwaters Watershed - 14010001



Satellite Imagery: ArcIMS Server - Geographic Network hosted by ESRI

Common Resource Areas (CRA)



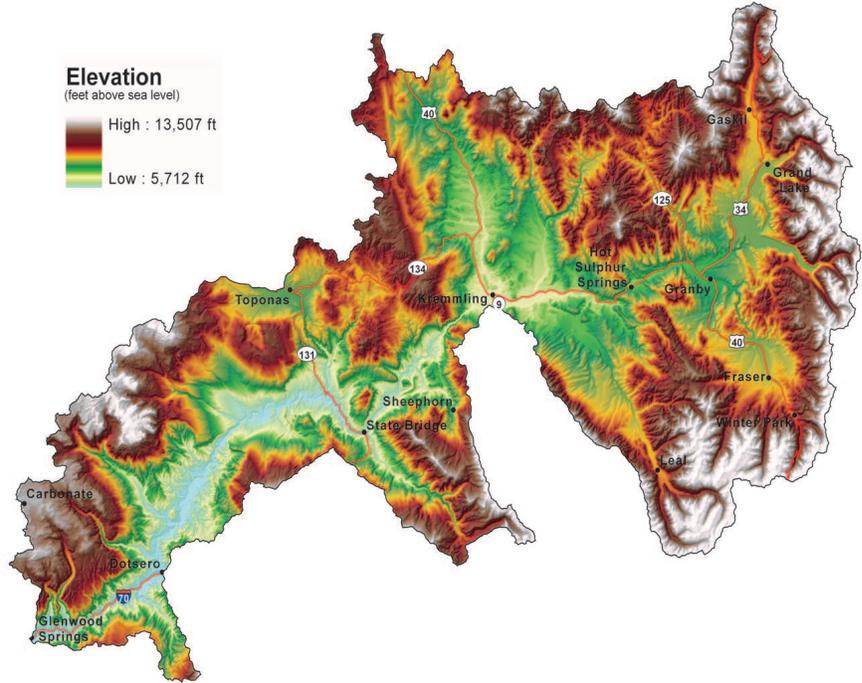
CRA: A geographical area where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical boundaries of the common resource area.

MLRA	CRA	CRA NAME	CRA DESCRIPTION
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.
48B	48B.1	Southern Rocky Mountain Parks	This is an area of high elevation intermontane valleys surrounded by the Southern Rocky Mountains. The temperature regimes are mainly cryic, moisture regimes are aridic and ustic. Characteristic vegetation is big sagebrush-grass or grassland. Grazing is the dominant land use.

Physical Description

This area is best characterized by steep, high mountain ranges and associated mountain valleys. 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.

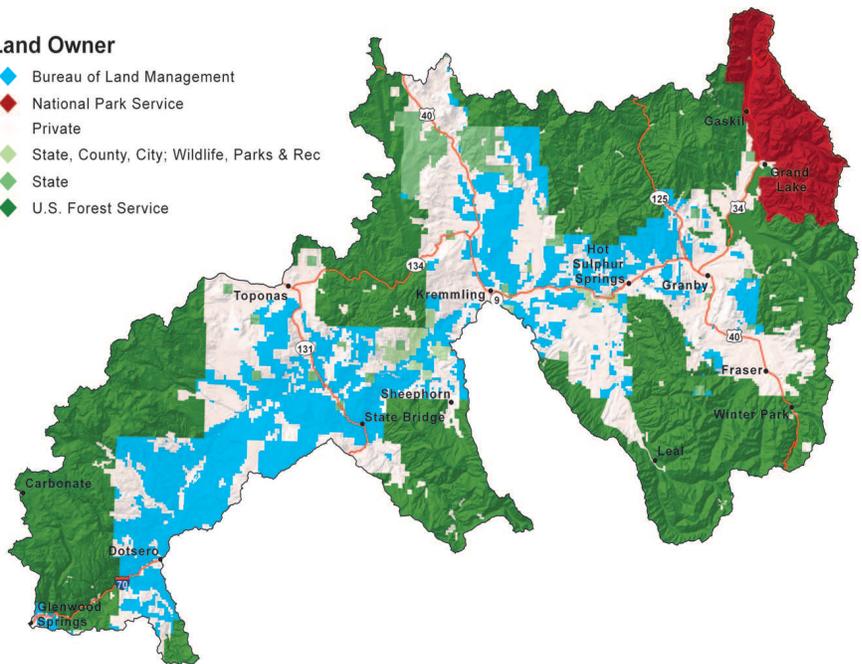
Much of this area is federally owned. The remainder consists of farms, ranches, or other private holdings. The upper mountain slopes, below timberline, are forested. Grassland occurs above timberline at lower elevations and in valleys. Most of the grassland and much of the open woodland is grazed. Recreation, mining, and wildlife habitat are important land uses throughout this area. Small valleys are irrigated and used for growing hay and pasture for livestock.



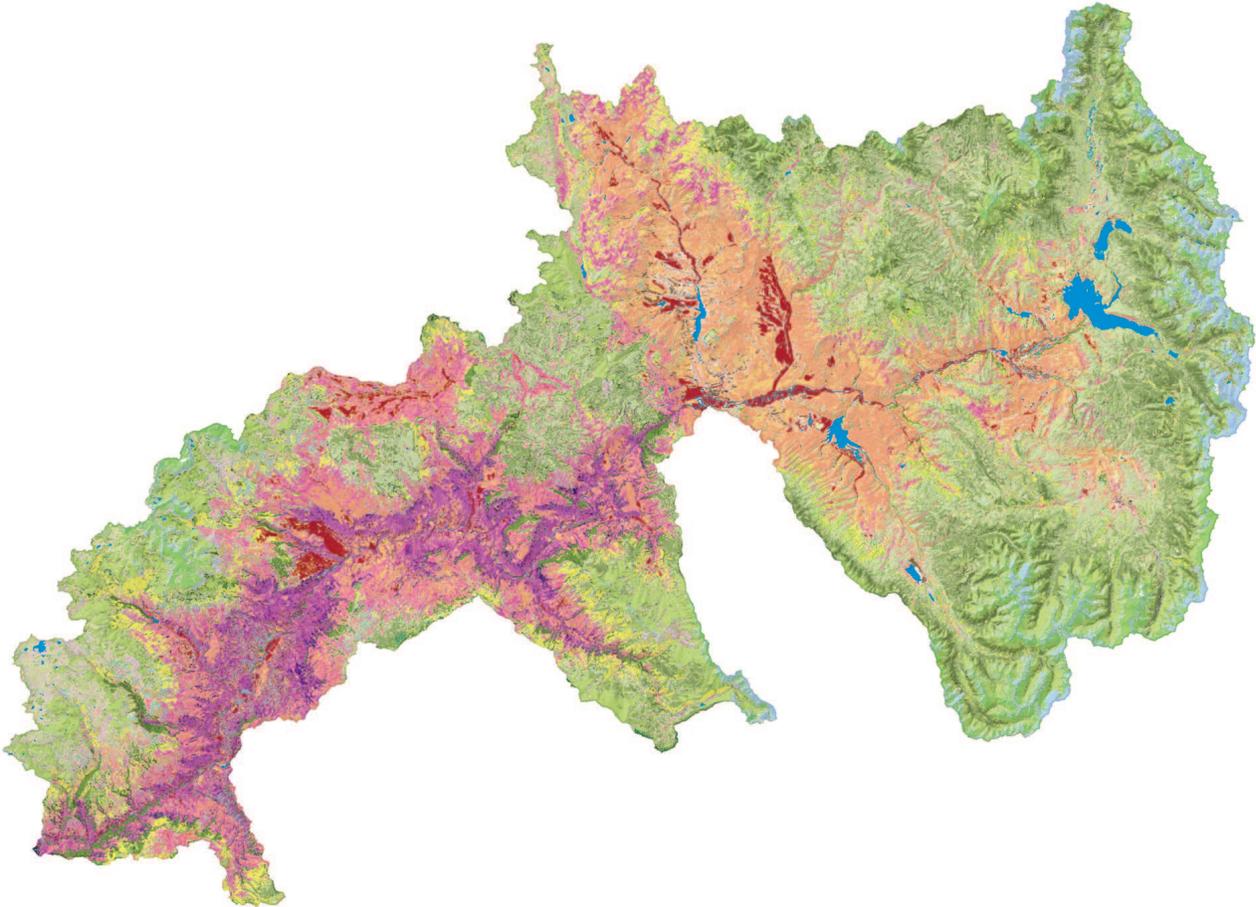
Bureau of Land Management	327,917
National Park Service	95,514
Private	472,100
State	42,936
State, County, City; Wildlife, Parks & Recreation	13,787
U.S. Forest Service	904,147

Land Owner

- ◆ Bureau of Land Management
- ◆ National Park Service
- Private
- ◆ State, County, City; Wildlife, Parks & Rec
- ◆ State
- ◆ U.S. Forest Service

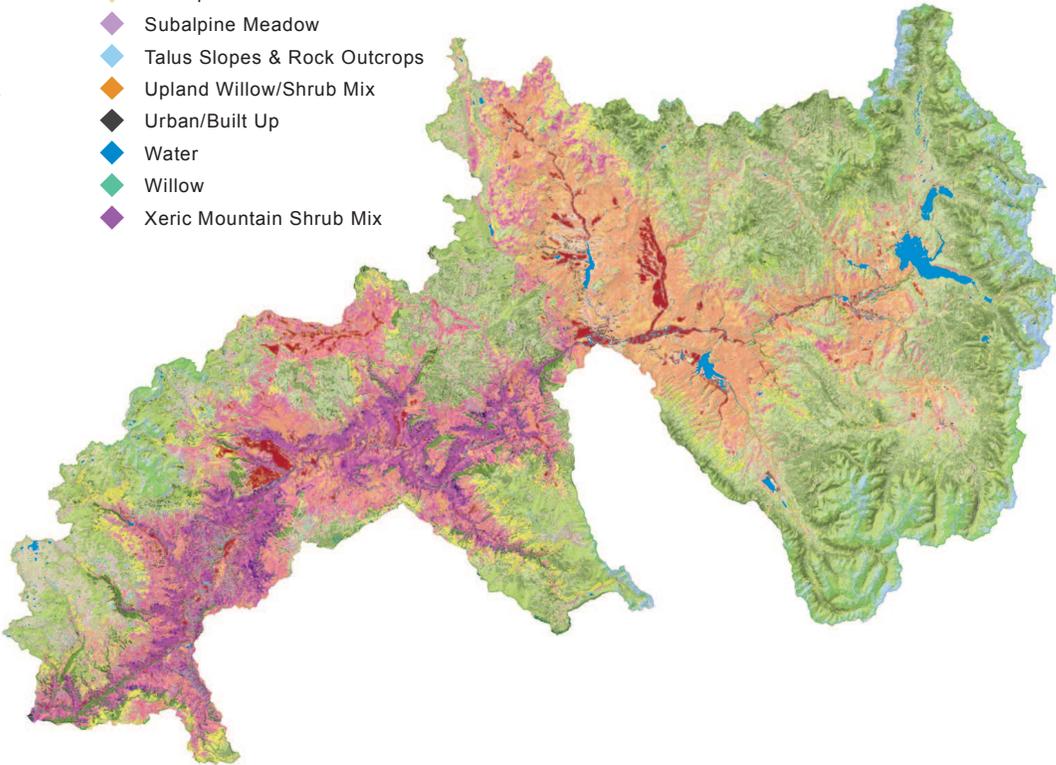


COLORADO HEADWATERS Land Use	Acreage
Cropland	36,166
Riparian/Grassland	803,076
Forest	906,673
Riparian	8,517
Water	16,648
Other	85,230
Total Watershed Acres	1,856,310



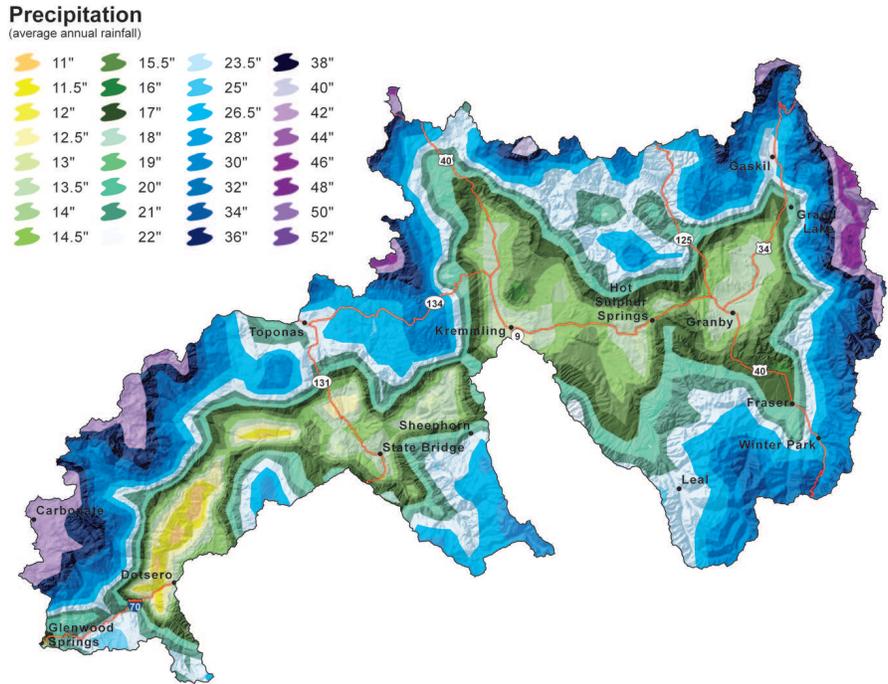
Vegetation

- ◆ No Data
- ◆ Agriculture Land
- ◆ Alpine Forb Dominated
- ◆ Alpine Grass 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
- ◆ 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
- ◆ Limber Pine
- ◆ Lodgepole Pine
- ◆ Lodgepole Pine/Aspen Mix
- ◆ Lodgepole/Spruce/Fir Mix
- ◆ Mesic Mountain Shrub Mix
- ◆ Mixed Forest Land
- ◆ Orchard
- ◆ PJ-Mtn Shrub 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
- ◆ Snow
- ◆ Snowberry
- ◆ Snowberry/Shrub Mix
- ◆ Soil
- ◆ Sparse Grass (Blowouts)
- ◆ Sparse Juniper/Shrub/Rock Mix
- ◆ Sparse PJ/Shrub/Rock Mix
- ◆ Spruce/Fir Regeneration
- ◆ Spruce/Fir/Aspen Mix
- ◆ Spruce/Fir/Lodgepole/Aspen Mix
- ◆ Spruce/Lodgepole Pine Mix
- ◆ 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



Climate

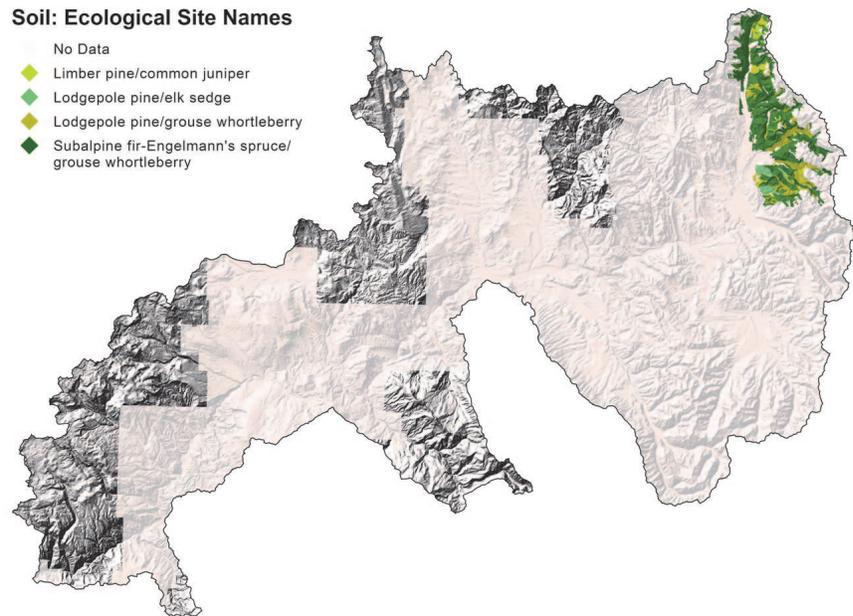
The average annual precipitation in the foothills and valleys in this area is 15 to 30 inches (380 to 760 millimeters). In some of the lower elevation valleys on the lee side of a mountain range, it is 7 to 15 inches (190 to 380 millimeters) per year. Average annual precipitation in the mountains themselves is 30 to 63 inches (760 to 1,605 millimeters). Rainfall occurs as high intensity, convective thunderstorms during the growing season but most of the precipitation falls in winter as snow. The average annual temperature is 26 to 54 degrees F (-3 to 12 degrees C). The frost-free period averages 135 days but ranges from 45 to 230 days.

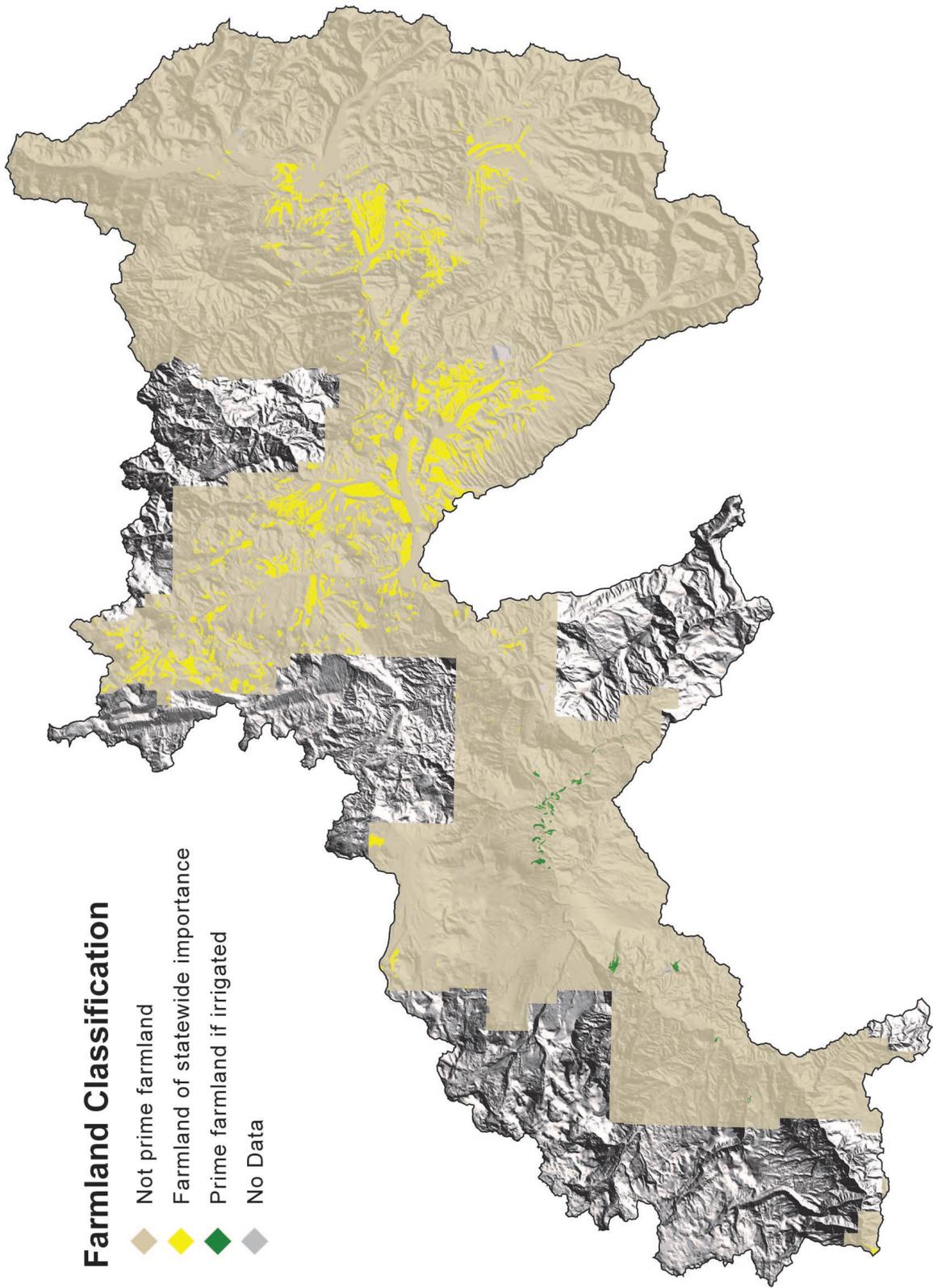


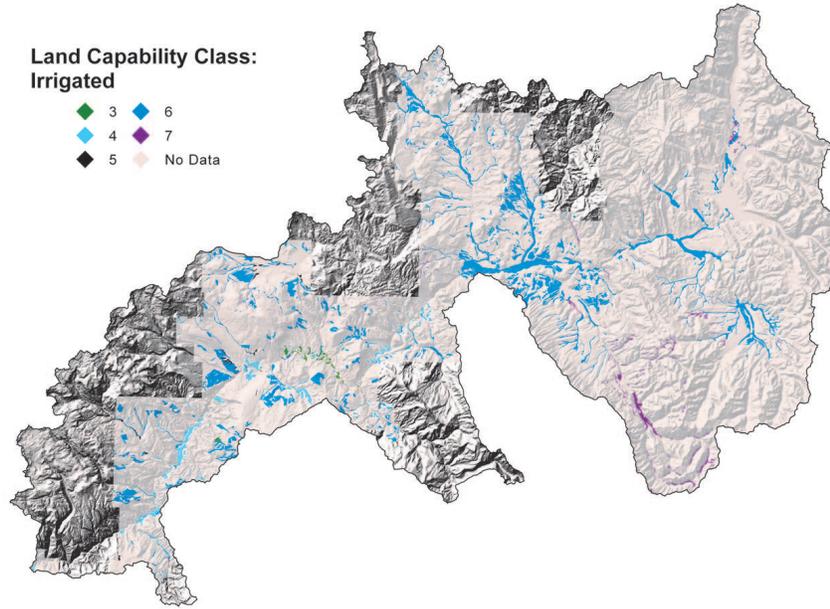
Ecological Sites

The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

Ecological Site maps give an overall indication of the soils plant relationship in the area. More detailed descriptions of ecological sites are provided in the Field Office Technical Guide (FOTG). The FOTG is available in local offices of the Natural Resources Conservation Service (NRCS) and online at <http://www.nrcs.usda.gov/technical/efotg/>.







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.

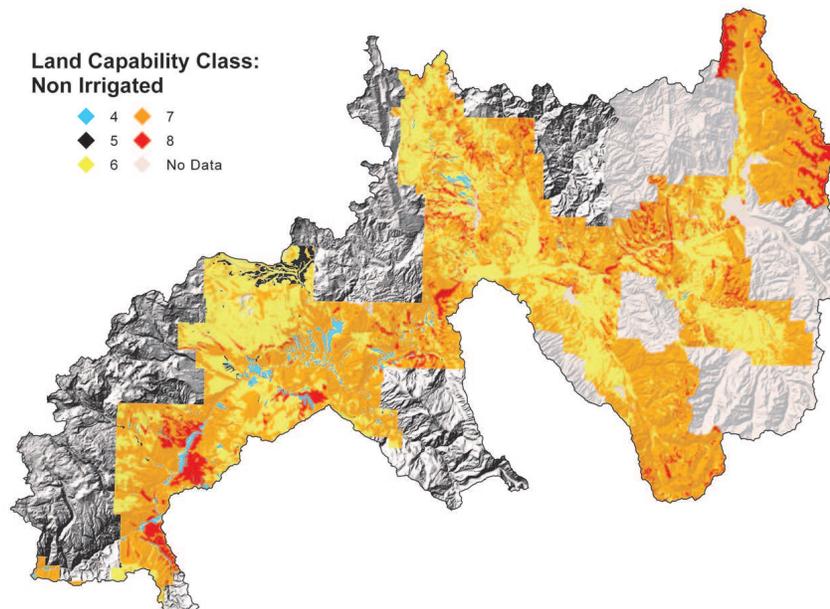
Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

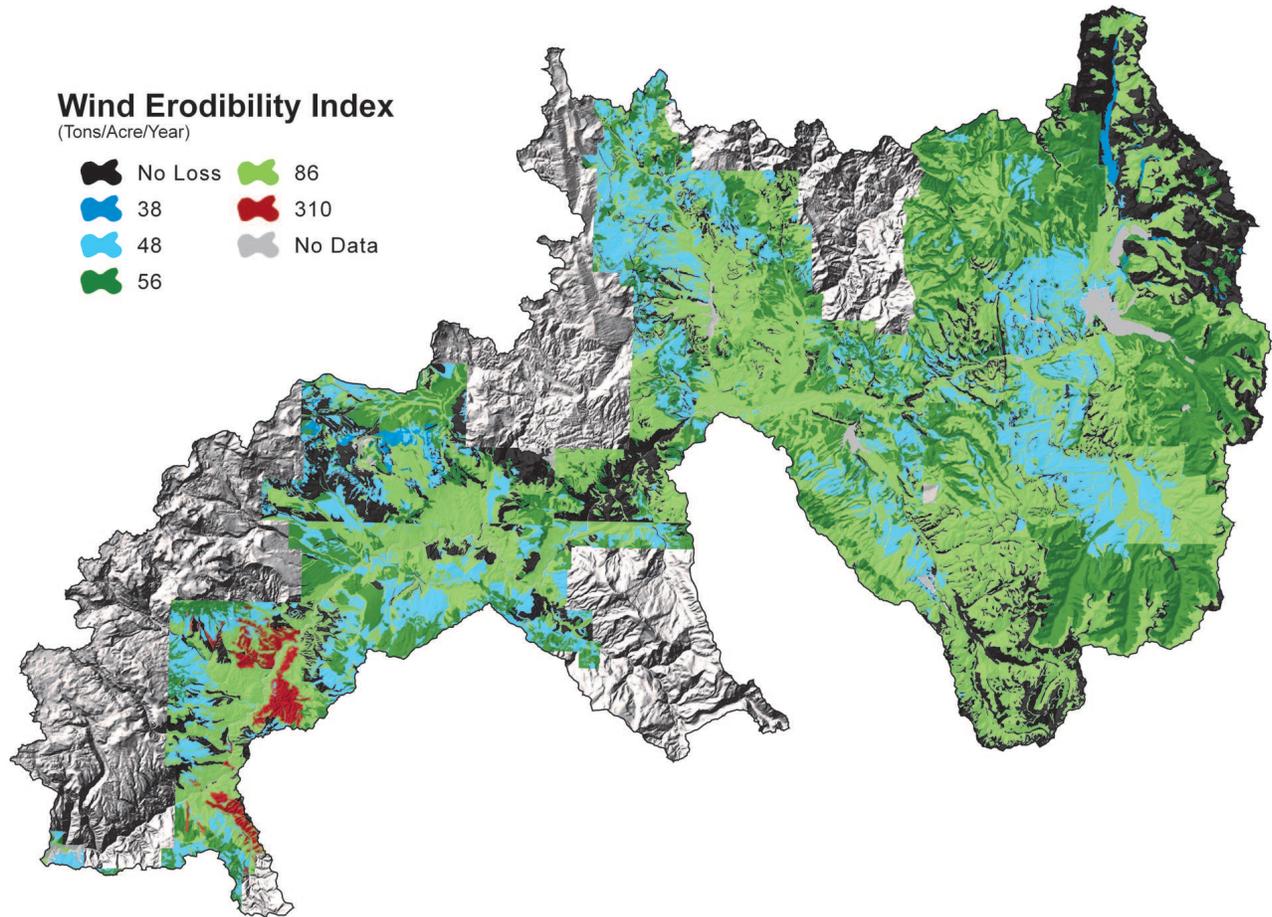
Class 5 - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

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 Watershed are considered highly erodible.

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

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Birds	Concern/None	Nests in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Winter range and nest and roost sites in the watershed
Boreal Toad	<i>Bufo boreas boreas</i>	Amphibians	Endangered/None	Occurs in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	Occurs in the watershed
Colorado River Cutthroat Trout	<i>Oncorhynchus clarki pleuriticus</i>	Fish	Concern/None	Occurs in the watershed
Colorado Roundtail Chub	<i>Gila robusta</i>	Fish	Concern/None	May occur in the watershed
Columbian Sharp-tailed Grouse	<i>Tympanuchus phasianellus columbianus</i>	Birds	Concern/None	Occurs in the Routt County portion of the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	May occur in the watershed
Mountain Sucker	<i>Catostomus playtrhynchus</i>	Fish	Concern/None	May occur in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibians	Concern/None	Occurs in the watershed
Osterhout Milkvetch	<i>Astragalus osterhoutii</i>	Plants	None/Endangered	Occurs in the watershed
Penland Beardtongue	<i>Penstemon penlandii</i>	Plants	None/Endangered	Occurs in the watershed
River Otter	<i>Lontra canadensis</i>	Mammals	Threatened/None	Occurs in the watershed
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	Birds	Concern/None	Occurs in the watershed
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/None	Occurs in the watershed
Wolverine	<i>Gulo gulo</i>	Mammals	Endangered/None	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 a small amount of irrigated hayland; big sagebrush, oak, and pinyon-juniper shrub habitats; coniferous and aspen forest habitats; subalpine meadows; and alpine tundra. Numerous riparian areas and wetlands provide aquatic habitats in the watershed.

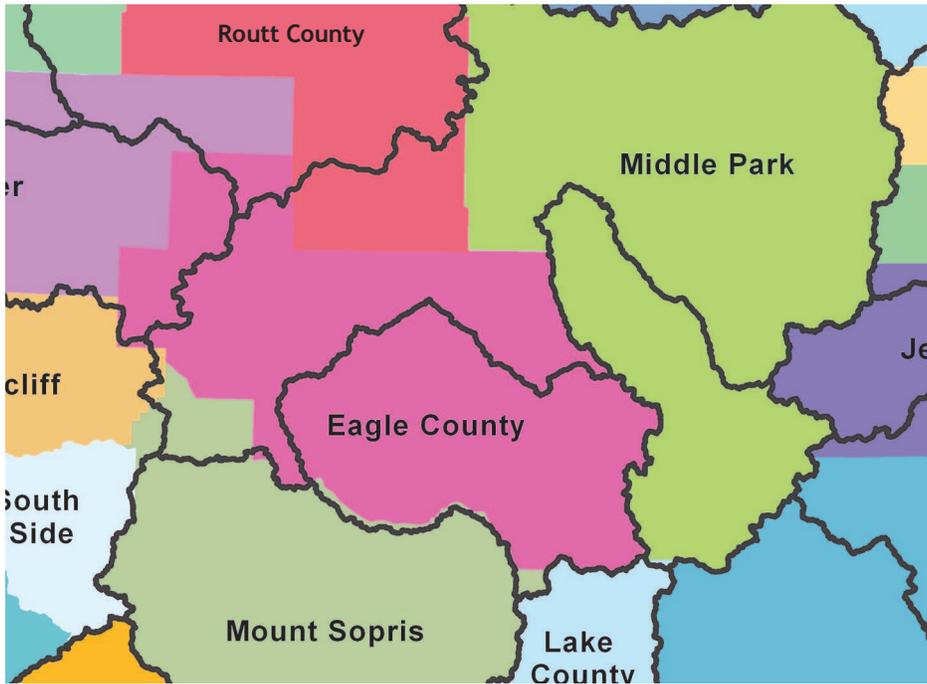
Wildlife species found in this watershed are diverse. Wildlife species found at the highest elevations in the watershed include pika, marmot, bighorn sheep, mountain goats, and white-tailed ptarmigan.

Economically important species in the watershed include: black bear, elk, mule deer, moose, mountain lion, and trout, throughout most of the watershed; and wild turkey in the foothills and mountain zones in the center and southern parts of the watershed.

Social Data

	Eagle	Garfield	Grand	Routt
Demographics (US Census, American Factfinder)				
Total population	41,659	43,791	12,442	19,690
Male	22,813	22,489	6,593	10,599
Female	18,846	21,302	5,849	9,091
Median age (years)	31.2	34.2	36.9	35
White	35,558	39,394	11,839	19,079
Black or African American	142	196	60	25
American Indian and Alaska Native	296	310	54	96
Asian	342	191	85	76
Native Hawaiian and Other Pacific Islander	30	35	12	18
Some other race	4498	2861	249	144
Hispanic or Latino (of any race)	9682	7300	543	634
Economic Characteristics (US Census, American Factfinder)				
In labor force (population 16 years and over)	26,598	23,562	7,768	12,687
Median household income (dollars)	62,682	47,016	47,759	53,612
Median family income (dollars)	68,226	53,840	55,217	61,927
Per capita income (dollars)	32,011	21,341	25,198	28,792
Families below poverty level	358	522	172	135
Individuals below poverty level	3221	3206	901	1183
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)				
Farms (number)	114	499	173	593
Land in farms/ranches (acres)	115,998	404,335	219,598	450,239
Average size farm/ranch (acres)	1,018	810	1,269	759
Median size farm (acres)	181	110	350	188
Average age of farmer or rancher	53.9	54	54.8	52.1
Net cash return from ag sales (\$1,000)	1,239	-1,364	-1,467	1,626
Cattle and calves (number)	6,000	22,000	18,000	26,000

Natural Resource Concerns



The Conservation Districts identified and prioritized these resource concerns during facilitated public meetings held between 1998 and 2000 and are part of the Conservation District's Long Range Plans. Higher scores indicate higher priority

	Middle Park	Routt County	Eagle County	Mount Sopris	Totals
Rangeland and Vegetation Health	5		4	5	14
Water Quality & Quantity	4		4	4	12
Urban/Rural Interface	3	3	3	3	12
Weed Control		4	5		9
Wetlands and Riparian Areas		5			5

Selected Conservation Application Data		Colorado Headwaters Watershed 14010001					
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	20,518	24,457	Not Avail.	19,854	8,841	22,551	96,221
Total Conservation Systems Applied (Acres)	8,307	13,045	Not Avail.	15,453	11,355	8,596	56,756
Practices							
Prescribed Grazing	5,726	12,224	1,935	13,296	3,157	1,751	38,089

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 65,000 acres need to be treated on median sized ranches of 900 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	1.6	4,960
Pest Management (595)	Ac.	300	4,500	4,500
Pipeline (516)	Ft.	2,000	3.40	6,800
Upland Wildlife Habitat Management (645)	Ac.	300	na	
Irrigation Water Management	Ac.	85	450.00	38,250
Watering Facility (614)	No.	2	610	1,220
Costs to apply prescribed grazing per median sized ranch of 900 acres	No.	72	55,730	4,012,560
Subtotal Rangeland costs:				4,012,560

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/100293wqlimitedsegtdmlds.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:

Roosevelt Arapahoe Routt Area (CO645) Published 09/24/2007
 Grand County Area (CO649) Published 12/21/2006
 RMNP (CO651) Published 01/08/2007
 Georgetown Area (CO653) Published 01/08/2007
 Aspen-Gypsum Area (CO655) Published 01/08/2007
 Rifle Area (CO683) Published 01/10/2007

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.