



United States Department
of Agriculture

Fountain Watershed



Hydrologic Unit Code 11020003

Natural Resources
Conservation Service

Lakewood, Colorado

Rapid Assessment

RWA 11020003

August 2007



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

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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.

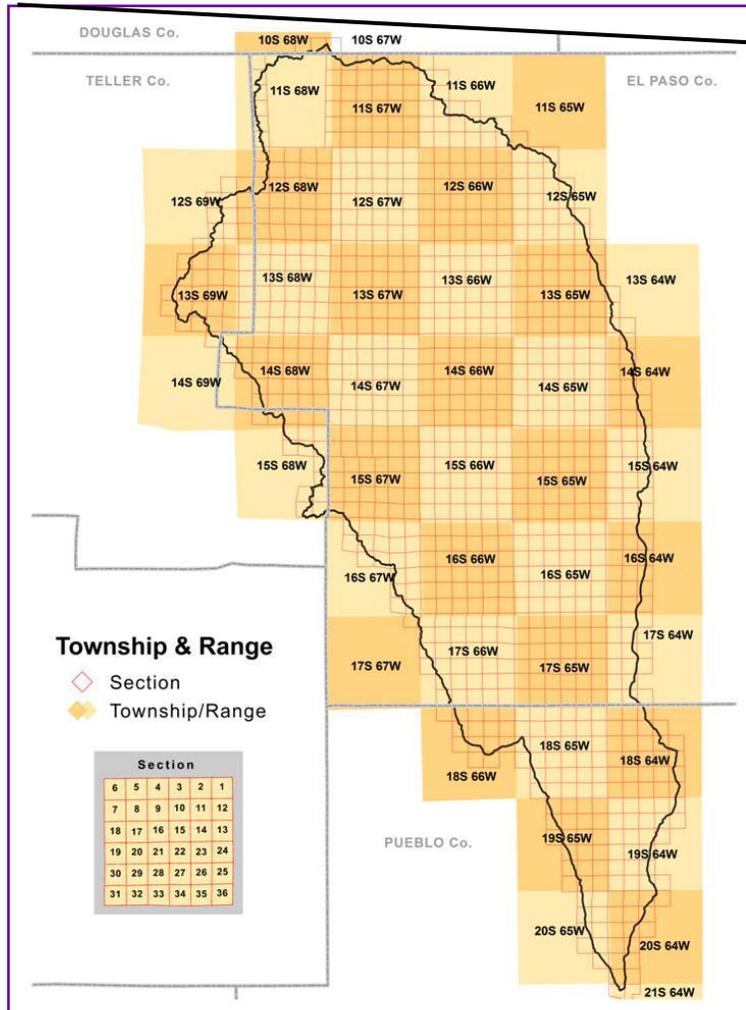
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best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

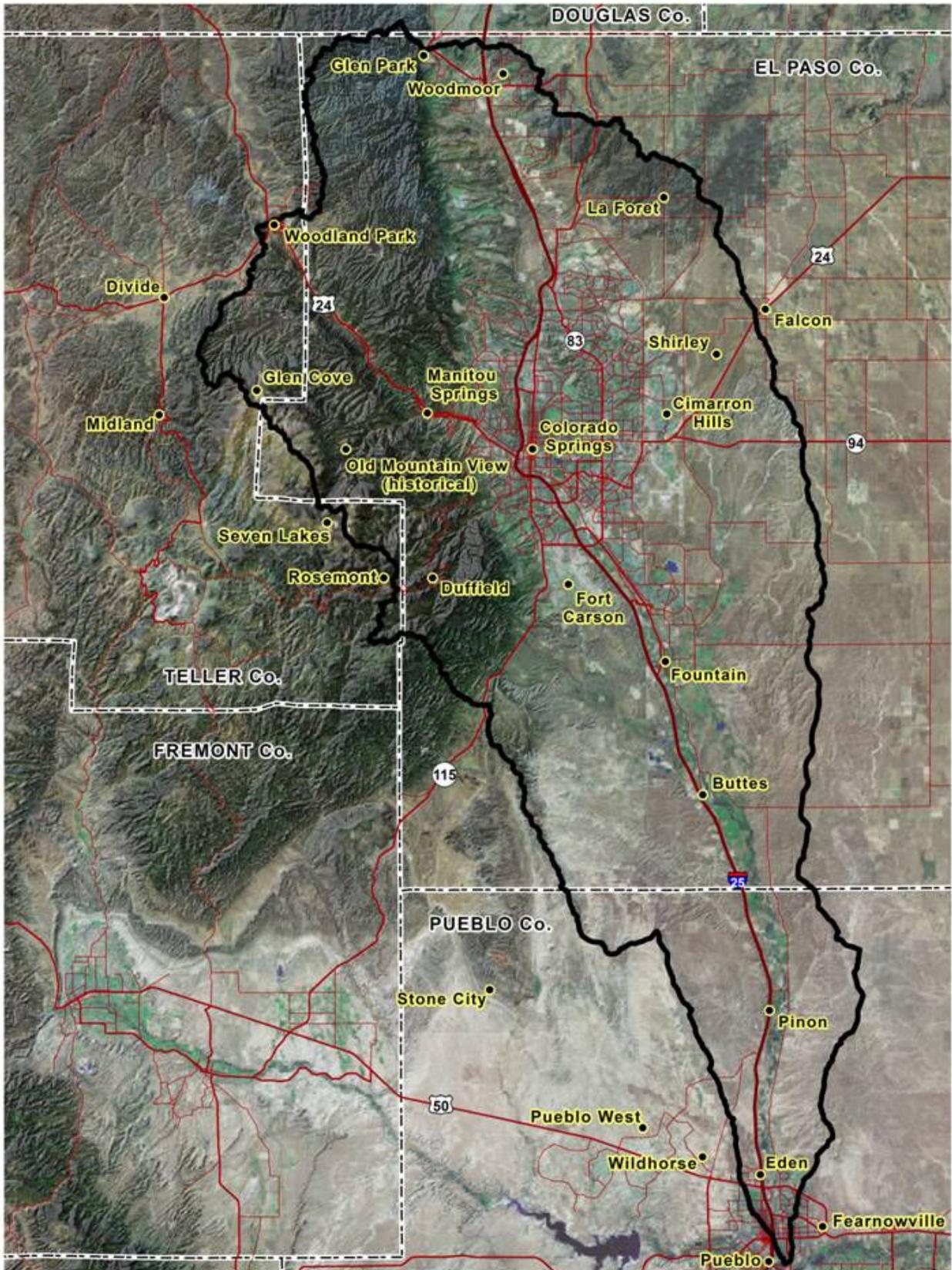
Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.



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

County	County Acres	County Acres in FOUNTAIN Watershed	% of County in the Watershed	% of Watershed in the County
Douglas	538,995	255	0.05%	0.04%
El Paso	1,362,117	492,918	36.19%	83.07%
Pueblo	1,533,605	73,136	4.77%	12.32%
Teller	357,405	27,098	7.58%	4.57%

Fountain Watershed - 11020003

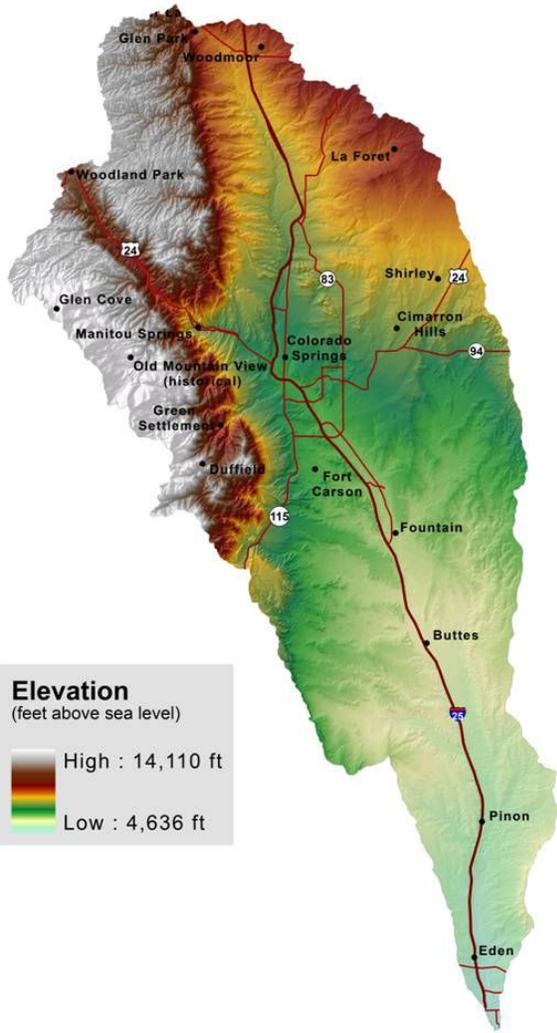


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Common Resource Areas (CRA): Geographical areas where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographical 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.
49	49.1	Southern Rocky Mountain Foot-hills	This area is generally a transition between the Great Plains and the Southern Rocky Mountains. The temperature regime is mesic or frigid, and moisture regime is ustic. Characteristic native vegetation ranges from grasslands and shrubs to ponderosa pine and Rocky Mountain Douglas fir forest.
69	69.1	Upper Arkansas Valley Rolling Plains	The Upper Arkansas Valley Rolling Plains CRA is broad, undulating to rolling shale plains occurring along the upper tributaries of the Arkansas River. Local relief reaches 200 feet. Soils are shallow to deep and formed in loess, aeolian, alluvial and outwash materials. Pre-settlement vegetation was short grass prairies and pinyon and juniper stands on the stony and rocky soils. Nearly all of this area is in rangeland. Small areas of irrigated cropland occur along the floodplains and terraces.



FOUNTAIN Land Use Total Acreage

Cropland	10,032
Rangeland/Grassland	346,543
Forest	158,139
Riparian	2,591
Water	3,950
Other	72,147
Total Watershed Acres	1,474,614

Land Ownership

Bureau of Land Management	1,245
Department of Defense	81,661
Private	377,671
State	23,731
State, County, City; Wildlife, Parks & Rec	3,051
U.S. Forest Service	106,050

Land Ownership

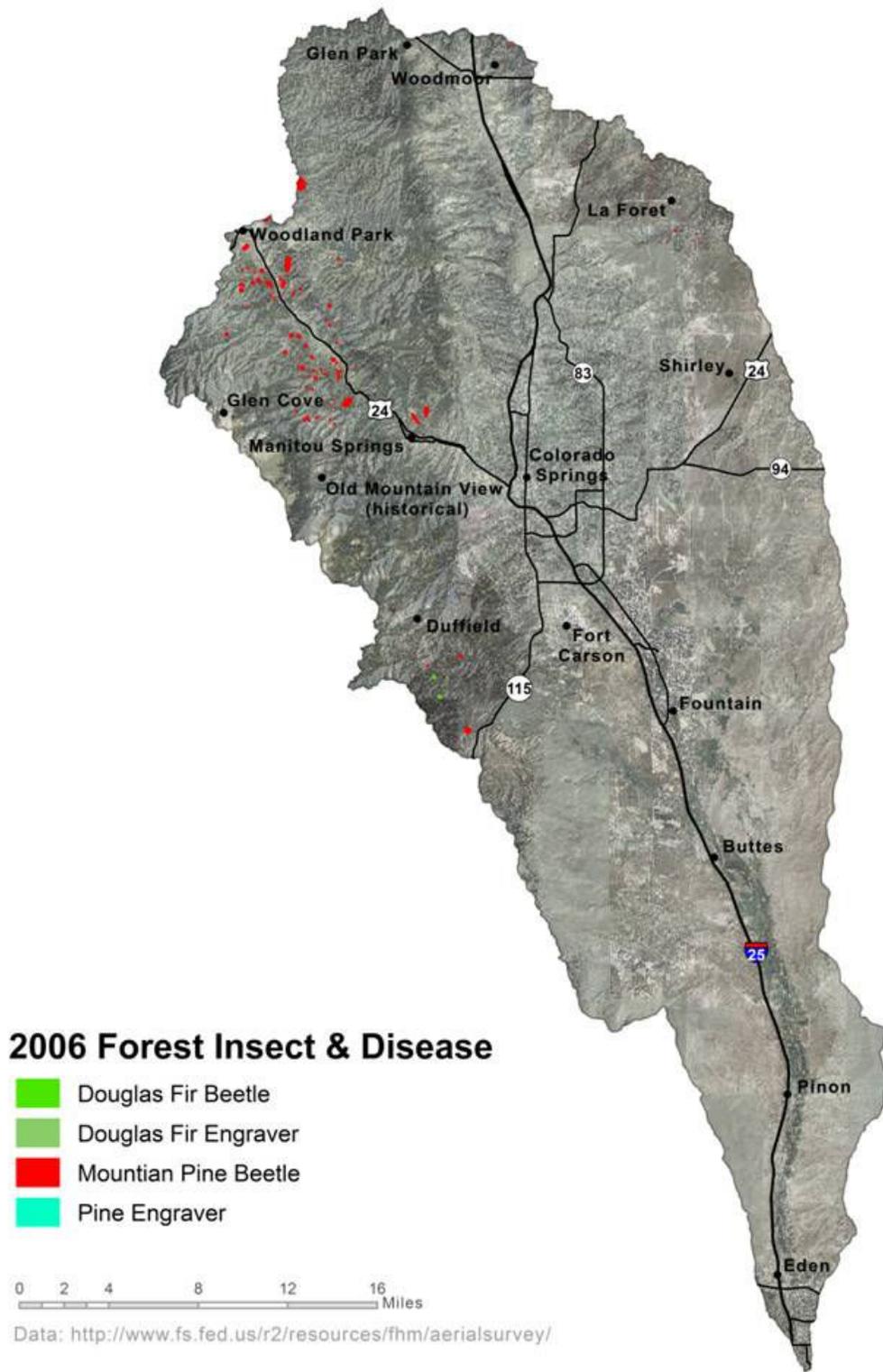
- ◆ Private Owner
- ◆ State Owned Land
- ◆ Bureau of Land Management
- ◆ U.S. Forest Service
- ◆ U.S. Department of Defense



Vegetation

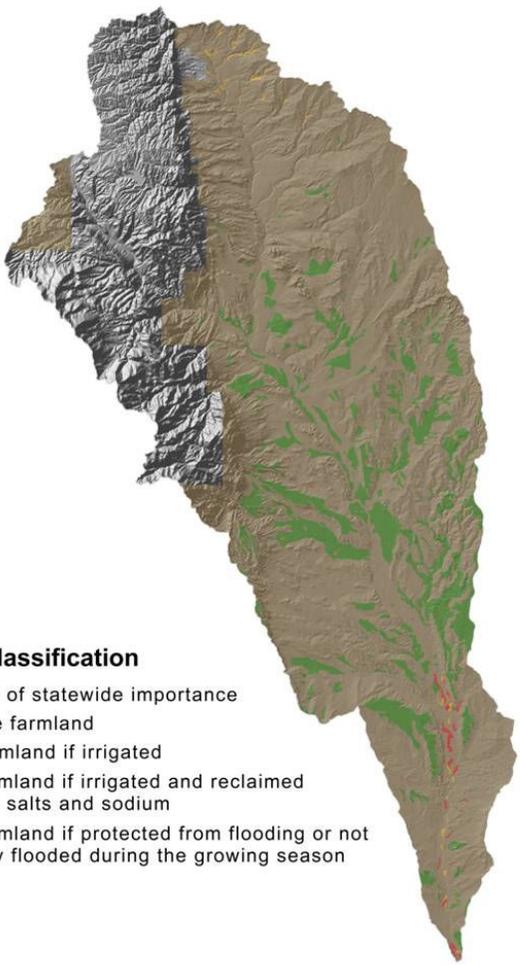
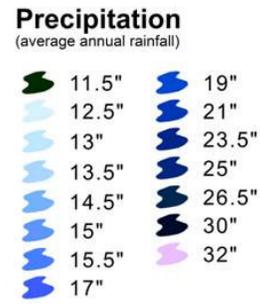
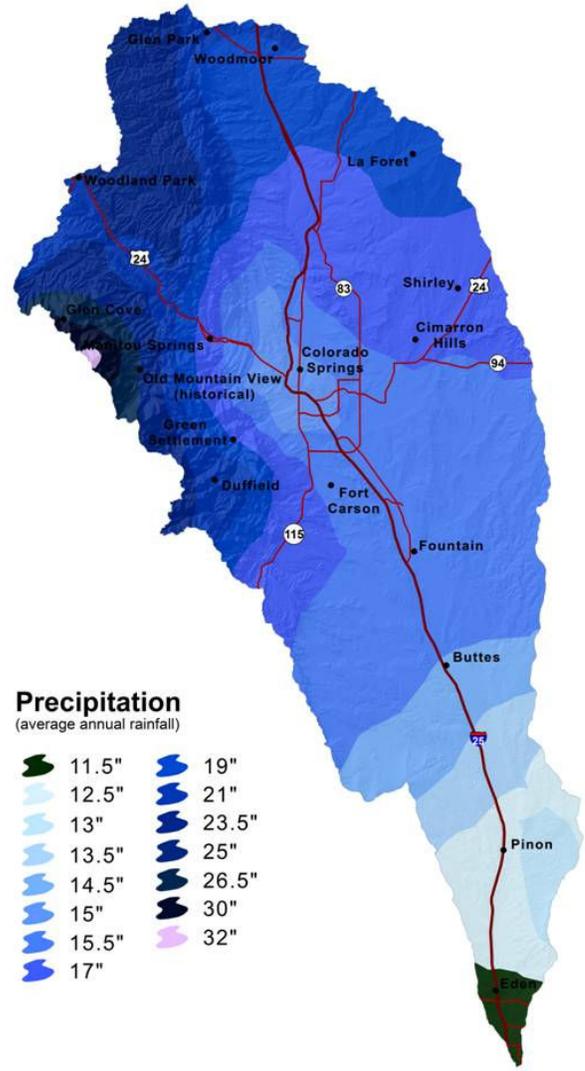
- | | |
|------------------------------------|----------------------------------|
| ◆ No Data | ◆ Rock |
| ◆ Alpine Grass Dominated | ◆ Sagebrush/Grass Mix |
| ◆ Alpine Grass/Forb Mix | ◆ Saltbush Community |
| ◆ Aspen | ◆ Shrub Riparian |
| ◆ Aspen/Mesic Mountain Shrub Mix | ◆ Shrub/Grass/Forb Mix |
| ◆ Barren Land | ◆ Soil |
| ◆ Bristlecone Pine | ◆ Sparse Grass (Blowouts) |
| ◆ Commercial | ◆ Sparse PJ/Shrub/Rock Mix |
| ◆ Cottonwood | ◆ Spruce/Fir/Aspen Mix |
| ◆ Douglas Fir | ◆ Spruce/Fir/Lodgepole/Aspen Mix |
| ◆ Douglas Fir/Aspen Mix | ◆ Spruce/Lodgepole Pine Mix |
| ◆ Douglas Fir/Englemann Spruce Mix | ◆ SubAlpine Shrub Community |
| ◆ Dryland Ag | ◆ Subalpine Grass/Forb Mix |
| ◆ Englemann Spruce/Fir Mix | ◆ Talus Slopes & Rock Outcrops |
| ◆ Fir/Lodgepole Pine Mix | ◆ Upland Willow/Shrub Mix |
| ◆ Gambel Oak | ◆ Urban/Built Up |
| ◆ Grass Dominated | ◆ Water |
| ◆ Grass/Forb Mix | ◆ Willow |
| ◆ Grass/Misc. Cactus Mix | ◆ Xeric Mountain Shrub Mix |
| ◆ Grass/Yucca Mix | |
| ◆ Herbaceous Riparian | |
| ◆ Irrigated Ag | |
| ◆ Limber Pine | |
| ◆ Lodgepole Pine | |
| ◆ Lodgepole Pine/Aspen Mix | |
| ◆ Lodgepole/Spruce/Fir Mix | |
| ◆ Mesic Mountain Shrub Mix | |
| ◆ P. Pine/Gambel Oak Mix | |
| ◆ PJ-Mtn Shrub Mix | |
| ◆ PJ-Oak Mix | |
| ◆ Pinon-Juniper | |
| ◆ Ponderosa Pine | |
| ◆ Ponderosa Pine/Aspen Mix | |
| ◆ Ponderosa Pine/Douglas Fir Mix | |
| ◆ Ponderosa Pine/Mesic Mtn. Shrub | |
| ◆ Rabbitbrush/Grass Mix | |
| ◆ Residential | |
| ◆ Riparian | |





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.



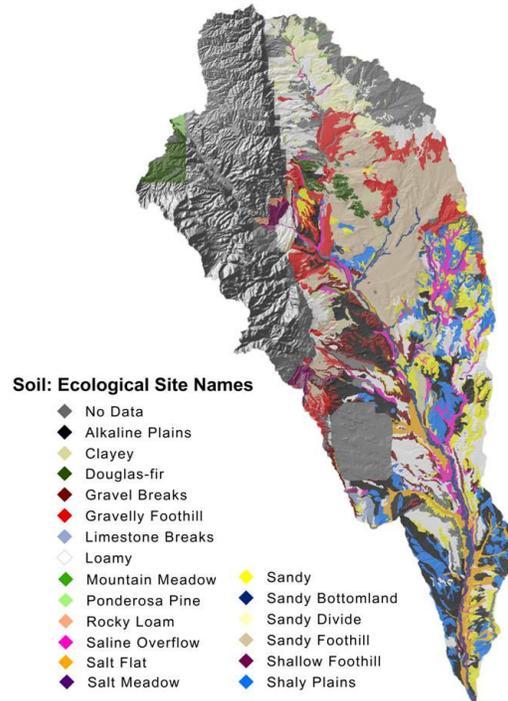
Farmland Classification

- ◆ Farmland of statewide importance
- ◆ Not prime farmland
- ◆ Prime farmland if irrigated
- ◆ Prime farmland if irrigated and reclaimed of excess salts and sodium
- ◆ Prime farmland if protected from flooding or not frequently flooded during the growing season

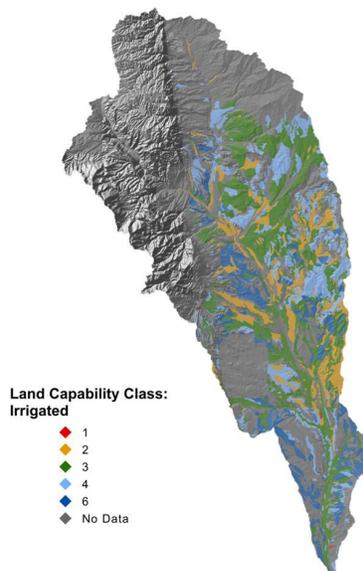
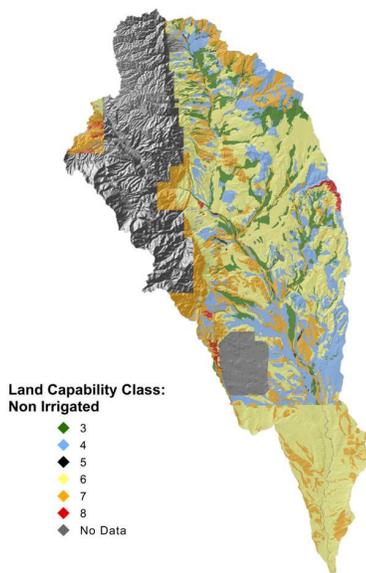
Ecological Sites

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 Classification



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.

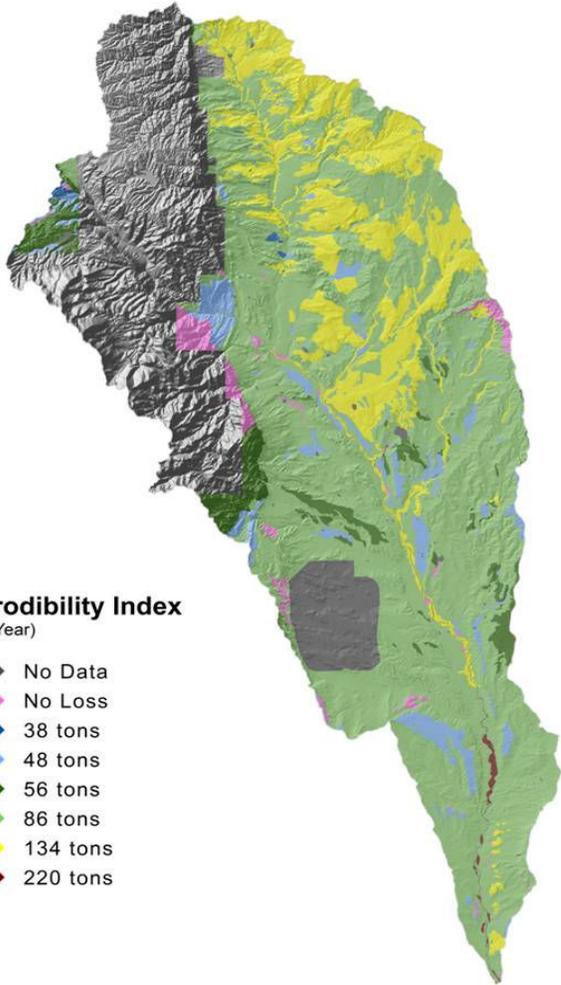
Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

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.

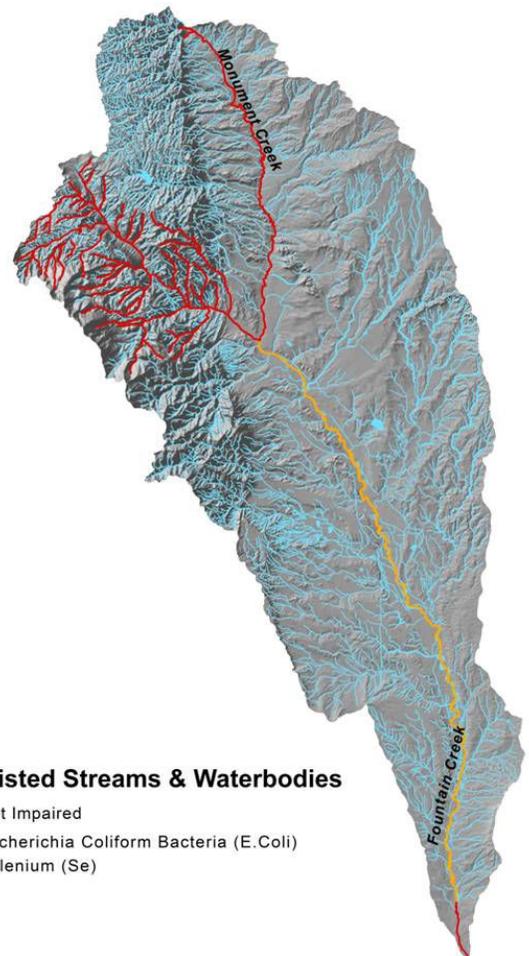
Class 8 - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.



The Wind Erodibility Index (WEI), is a 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.

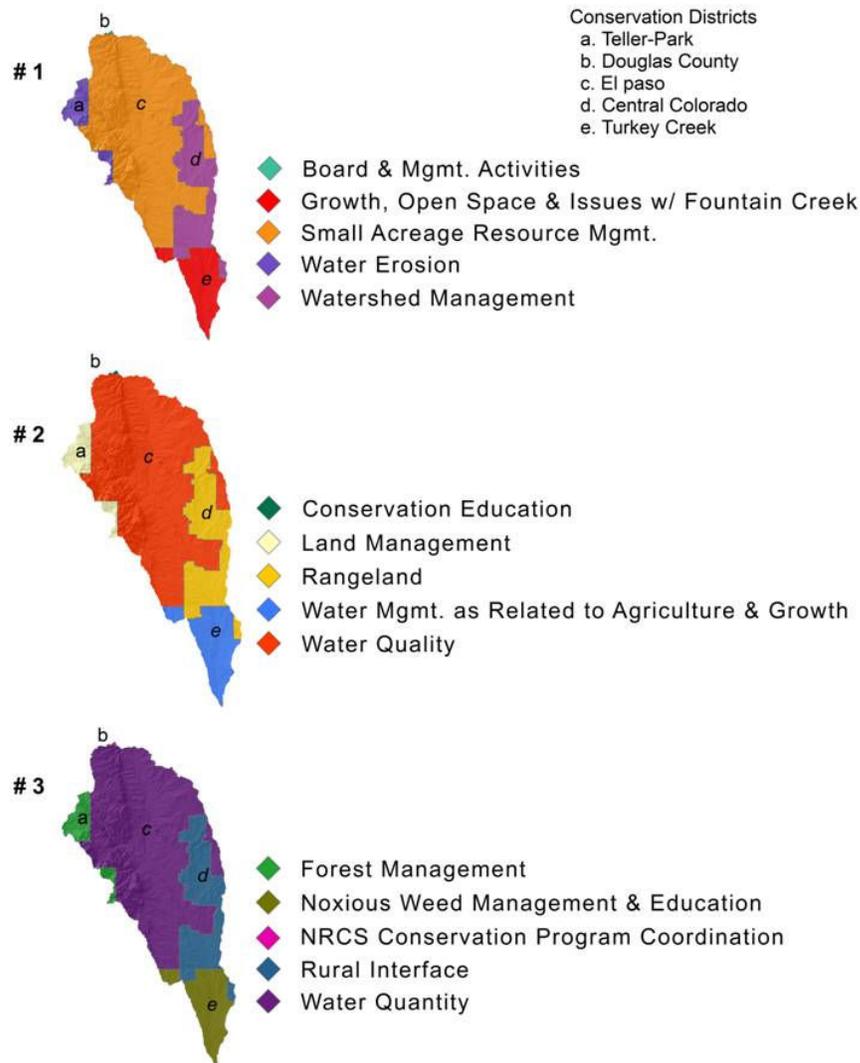
As shown on the Wind Erodibility Index map below, most soils in the Fountain Watershed are highly erodible.



303(d) Listed Streams & Waterbodies

Fountain Watershed Natural Resource Concerns

Identified Long Range Resource Concerns Top Three Concerns within Conservation Districts



Ranking of Conservation District's Natural Resource Concerns

	Erosion	Rangeland	Water Quality	Water Quantity	Wildlife	Invasive Species	Small Ag Acreage Mgt	Urban
Teller Park	5							
El Paso County			4	3		2	5	1
Douglas			5	4				
Turkey Creek				4	2	3		5
Central Colorado		4	5	5	1	2		3
Total Points	5	4	14	16	3	7	5	9

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

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Birds	Concern/None	Occurs in the watershed
Arkansas Darter	<i>Etheostoma cragini</i>	Fish	Threatened/Candidate	May occur in the watershed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened/None	Winter along Fountain Creek
Black-footed Ferret	<i>Mustela nigripes</i>	Mammals	Endangered/Endangered	No current records of occurrence
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	Mammals	Concern/None	Occurs in the watershed
Burrowing Owl	<i>Athene cunicularia</i>	Birds	Threatened/None	Occurs in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	May occur in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern/None	Occurs in the watershed
Flathead Chub	<i>Platygobio gracilus</i>	Fish	Concern/None	Occurs in the watershed
Greenback Cutthroat Trout	<i>Oncorhynchus clarki stomias</i>	Fish	Threatened/Threatened	Occurs in the watershed
Long-Billed Curlew	<i>Numenius americanus</i>	Birds	Concern/None	May occur in the watershed
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Birds	Threatened/Threatened	Occurs in the watershed
Mountain Plover	<i>Charadrius montanus</i>	Birds	Concern/None	Occurs in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibians	Concern/None	Occurs in the watershed
Plains Leopard Frog	<i>Rana blairi</i>	Amphibians	Concern/None	Occurs in the watershed
Preble's Meadow Jumping Mouse	<i>Zapus hudsonius preblei</i>	Mammals	Threatened/Threatened	Occurs in the watershed
Swift Fox	<i>Vulpes velox</i>	Mammals	Concern/None	Occurs in the watershed
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/None	May occur in the watershed
Triploid checkered whiptail	<i>Cnemidophorus neotesselatus</i>	Reptiles	Concern/None	May occur in south part of the watershed
Ute Ladies'-tresses	<i>Spiranthes diluvialis</i>	Plants	None/Threatened	Occurs in the watershed
Slender Moonwort	<i>Botrychium lineare</i>	Plants	None/Candidate	Occurs in the watershed

The diverse terrestrial habitat types in this watershed range from shortgrass prairie to foothills shrublands to coniferous forest. Wildlife species found in this watershed are equally diverse. Species such as mountain plover, black-tailed prairie dog, and swift fox are adapted to the shortgrass prairie and its arid climate. Fountain Creek, seasonal streams with associated riparian areas, suburban ponds, and stock ponds provide aquatic habitats in the area. Higher in the watershed, in the shrub and forest habitats, species such as elk, Canada lynx, and Mexican spotted owl may be found. Economically important wildlife species that occur in the watershed include channel catfish, green sunfish, bluegill, trout, pronghorn (antelope), mule and white-tailed deer, elk, wild turkey, geese, mourning dove, and scaled quail.

Social Data				
County	Douglas	ElPaso	Pueblo	Teller
Demographics (US Census, American Factfinder)				
Total population	248,950	550,130	147,187	2,055
Male	124,213	272,922	71,711	10,412
Female	124,737	277,208	75,476	10,143
Median age (years)	32.9	33.5	36	39.4
White	225,373	444,799	120,922	19,510
Black or African American	3530	33484	2046	113
American Indian and Alaska Native	991	4855	1647	200
Asian	8045	15516	1072	120
Native Hawaiian and Other Pacific Islander	224	1241	202	16
Some other race	4655	29575	16496	185
Hispanic or Latino (of any race)	16205	70312	58024	718
Economic Characteristics (US Census, American Factfinder)				
In labor force (population 16 years and over)	140,132	288,867	72,727	11,493
Median household income (dollars)	87,670	50,714	37,305	50,165
Median family income (dollars)	99,531	61,719	45,765	57,071
Per capita income (dollars)	37,931	25,261	19,668	23,412
Families below poverty level	x	x	x	202
Individuals below poverty level	x	x	x	1096
X means that value is not applicable or not available				
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)				
Farms (number)	903	1175	801	118
Land in farms/ranches (acres)	199,491	811,931	774,352	73,643
Average size farm/ranch (acres)	221	691	967	624
Median size farm (acres)	55	160	175	90
Average age of farmer or rancher	55	54.1	55.5	55.3
Net cash return from ag sales (\$1,000)	-3,441	2,485	5,788	-227
Cattle and calves (number)	4,000	26,000	33,000	1,500

Selected Conservation Application Data

Fountain Watershed–11020003

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	29,771	1,466	na	31,226	1,831	11,512	75,806
Total Conservation Systems Applied (Acres)	27,385	161	na	28,663	55	13,947	70,211
Practices Applied							
Prescribed Grazing	4,532	0	4,740	22,571	0	13,480	45,323
Upland Wildlife Habitat Management	1,137	0	0	9,834	0	13,486	24,457
Irrigation Water Management	6000	0	35	1071	0	0	7106

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 75,800 acres to be treated on a median sized ranch of 1,500 acres.			Based on Conservation System Guide Code: CO 69.1-GR-01-R-Grazing
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost per Median Sized Ranch (\$)
Prescribed Grazing				
Fence (382)	Ft.	3,000	0.6	1,800
Pest Management (595)	Ac.	300	15	4,500
Pipeline (516)	Ft.	7,200	2.40	17,280
Upland Wildlife Habitat Management (645)	Ac.	300	na	0
Watering Facility (614)	No.	2	410	820
Windbreak/Shelterbelt Establishment (380)	Ft.	500	.85	425
Subtotal: Costs to apply prescribed grazing per median sized ranch of 1,500 acres	No.	50	24,825	\$1,241,250

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

Primary Resource Concern: Water Quality				
Conservation System Description:		Sprinkler irrigation system with IWM, Crop rotation, Mulch-till, Nutrient and Pest Mgt.		Reference Conservation System Guide Code: CO 69.1-CR-Pivot-R-2
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Conservation Crop Rotation (328)	Ac	3,000	10	30,000
Irrigation System, Sprinkler (442)	Ac	3,000	779	2,337,000
Irrigation Water Management (449)	Ac	3,000	5	15,000
Residue Mgmt, Mulch Till (345)	Ac	3,000	5	15,000
Nutrient Management (590)	Ac	9,000	5	45,000
Pest Management (595)	Ac	9,000	15	135,000
Subtotal Irrigated Crops:				\$2,577,000

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.	1,241,250
Irrigated Crop	Water		Nutrients and organics are stored, handled, disposed of, and managed so that surface water uses are not adversely affected.	2,577,000
Estimated Total Costs to Address Major Resource Concerns:				\$3,818,250

References Not Cited in Document

303(d) listed streams within Big Sandy Watershed 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/wqceregs/100293wqlimitedsegmdls.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:

El Paso County Area (CO625) Published 12/19/2005

Pueblo Area (CO626) Published 12/19/2005

Teller-Park Area (CO638) Published 01/24/2006

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.