



Colorado Department of  
Agriculture

State Conservation Board

United States Department  
of Agriculture

Natural Resources  
Conservation Service

Lakewood, Colorado

# Middle South Platte- Cherry Creek

Hydrologic Unit Code 10190003

RWA 10190012

## Rapid Assessment

October 2009



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

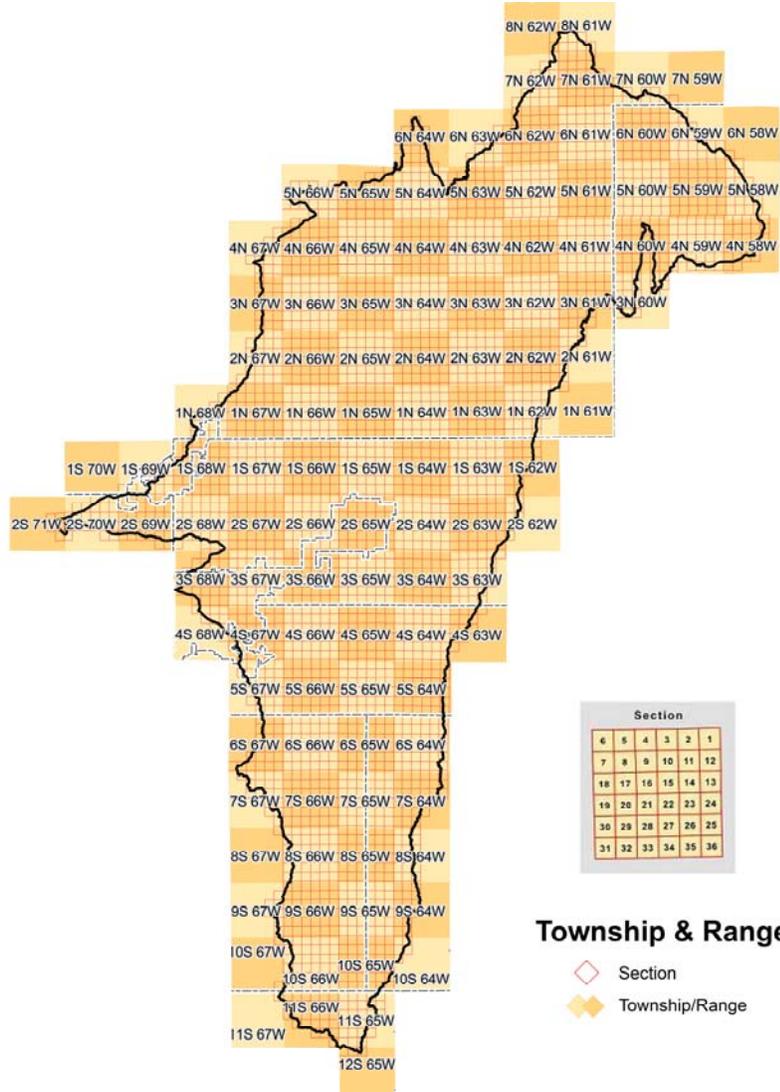
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

- 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)

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

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Section				
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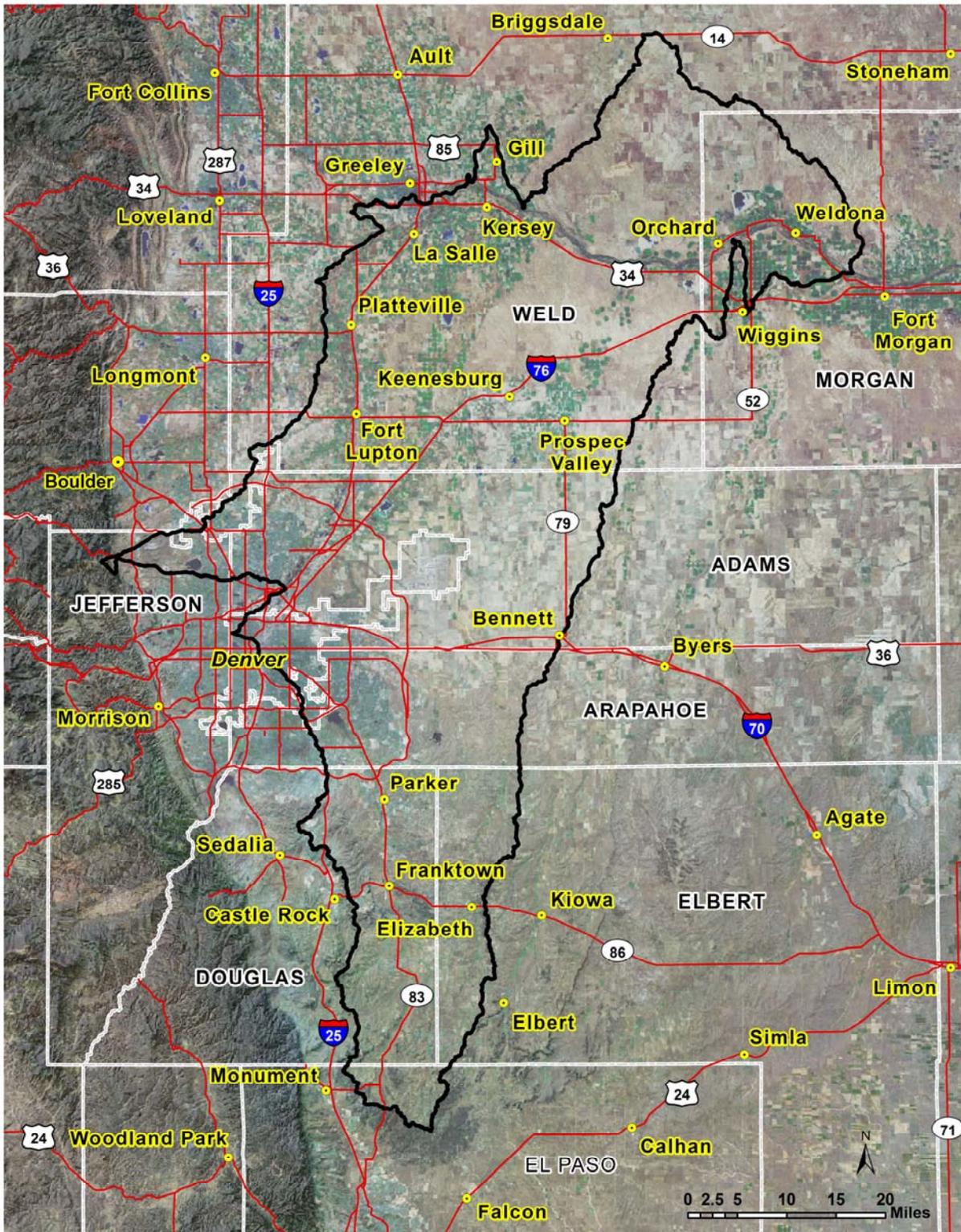
**Township & Range**

- Section
- Township/Range

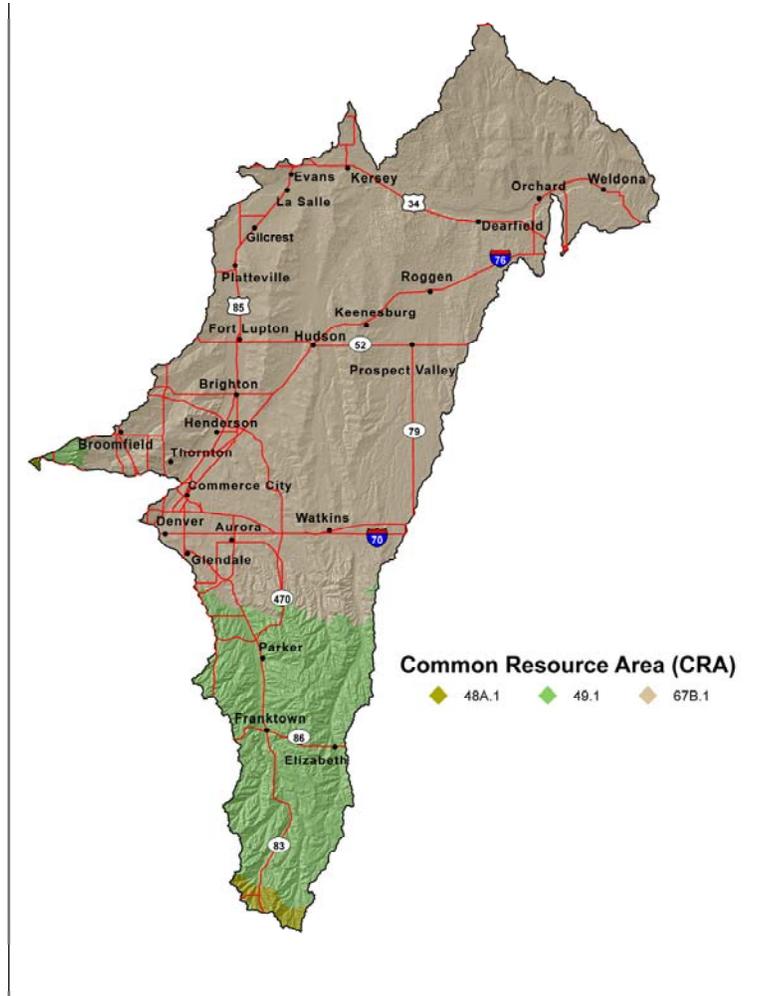
County	County Acres	County Acres in MIDDLE SOUTH PLATTE - CHERRY CREEK Watershed	% of County in the Watershed	% of Watershed in the County
Adams	756,499	340,933	45.1%	18.5%
Arapahoe	515,064	163,216	31.7%	8.9%
Boulder	473,815	18	0.004%	0.0%
Broomfield	21,482	15,926	74.1%	0.9%
Denver	99,733	72,199	72.4%	3.9%
Douglas	538,996	189,264	35.1%	10.3%
El Paso	1,362,117	27,953	2.1%	1.5%
Elbert	1,183,750	110,733	9.4%	6.0%
Jefferson	494,626	24,131	4.9%	1.3%
Morgan	827,504	147,845	17.9%	8.0%
Weld	2,568,823	748,688	29.1%	40.7%

Total Acres 1,840,907

### Middle South Platte-Cherry Creek Watershed - 10190003

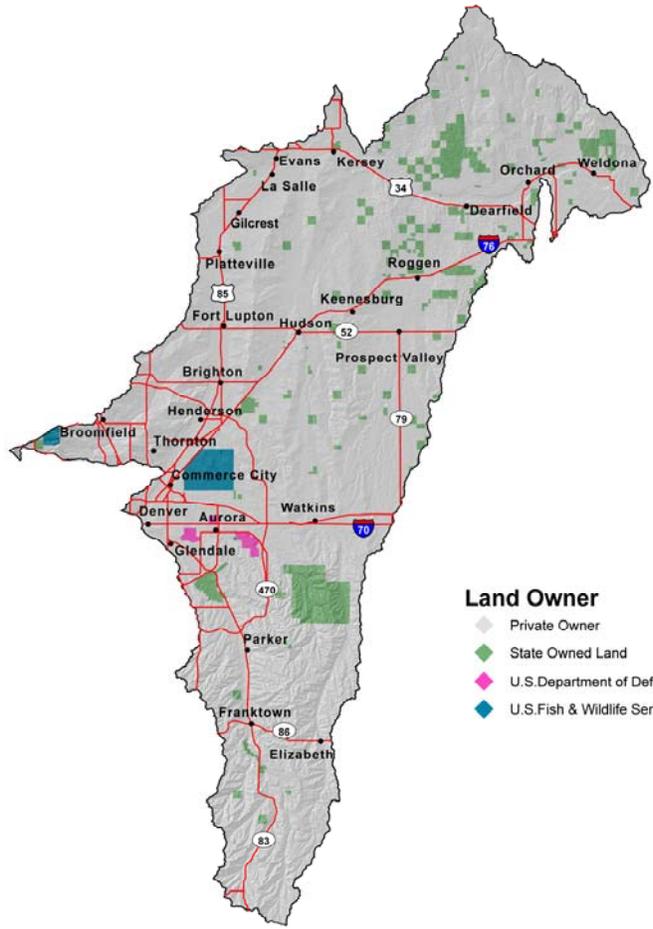
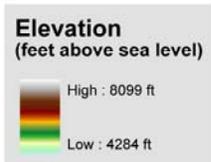
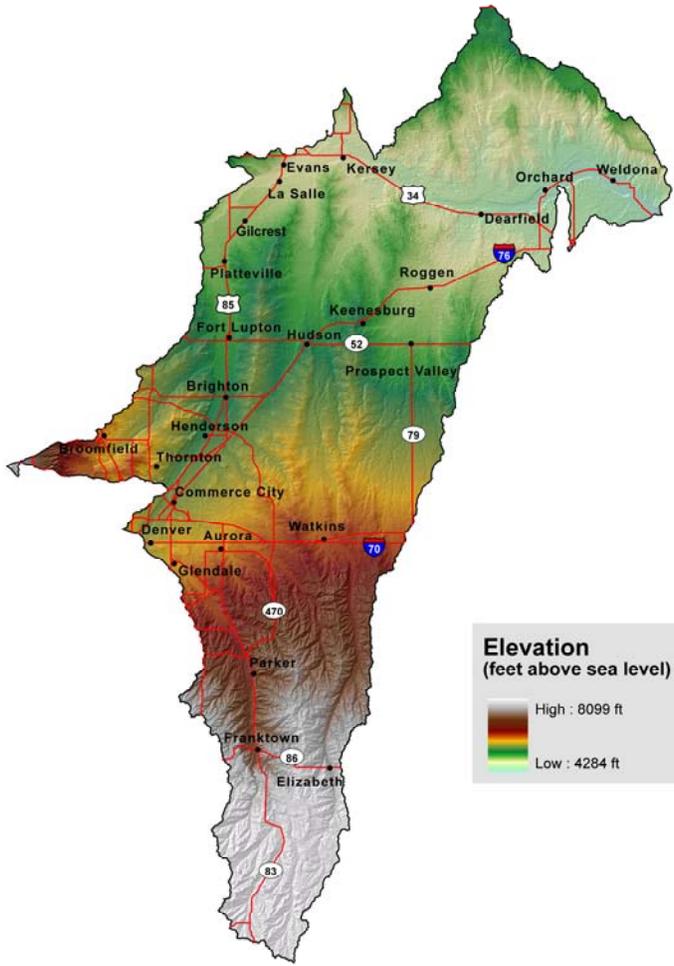


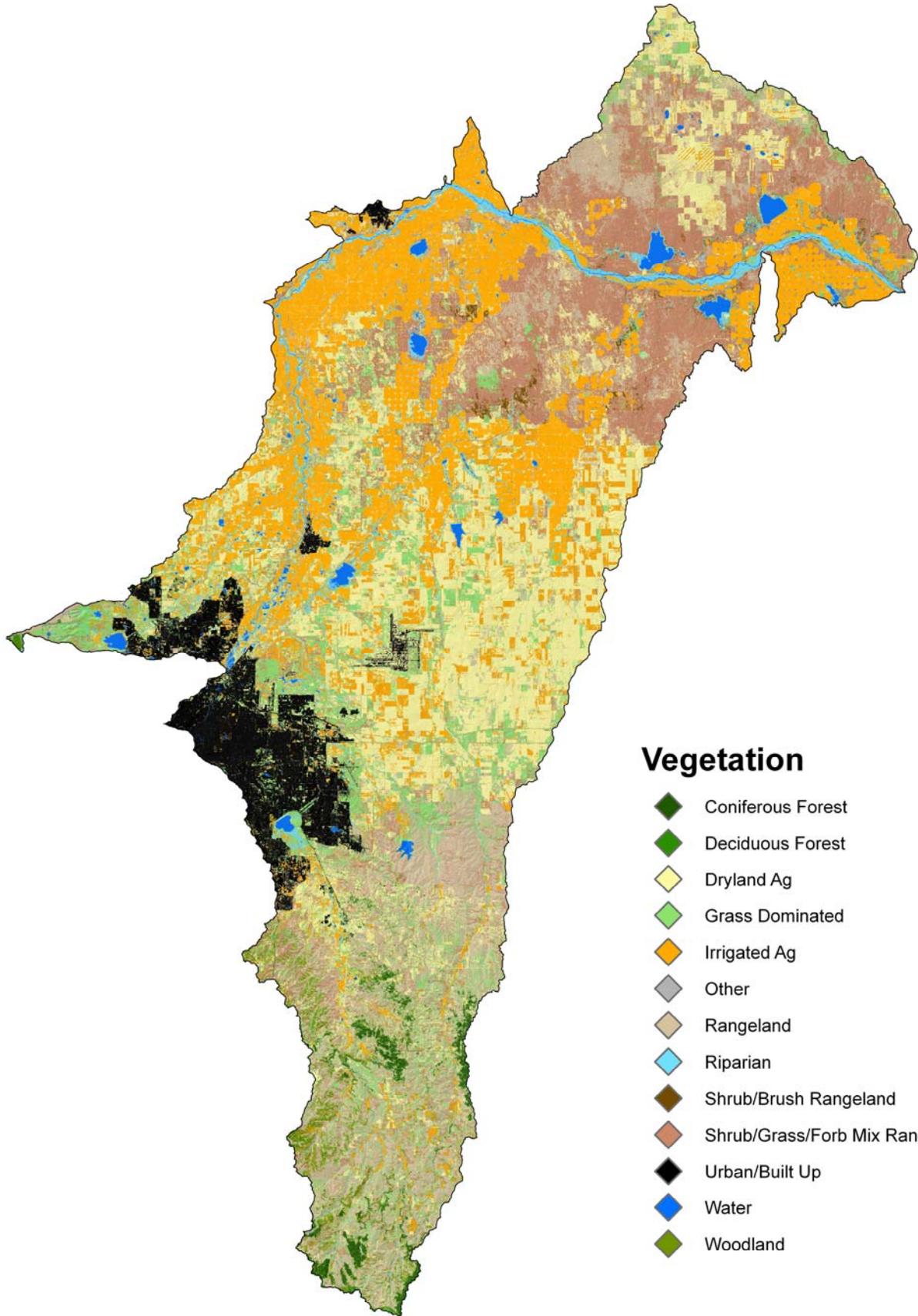
Satellite Imagery: Arc IMS Server - Geography Network Services hosted by ESRI



**Common Resource Area:** 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.
49	49.1	Southern Rocky Mountain Foothills	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.
67B	67B.1	Central Great Plains, Southern Part	The Central High Plains, Southern Part CRA is broad, undulating to rolling plains dissected by streams and rivers. Local relief is measured in tens of feet on the plains. Soils are deep and formed in aeolian and alluvial materials. Pre-settlement vegetation was short grass prairies. Nearly all of this area in fallow cropland rotations or rangeland. Some cropland areas are irrigated.





<b>MIDDLE SOUTH PLATTE - CHERRY CREEK Land Use</b>	<b>Total Acreage</b>	<b>Vegetation</b>	<b>Acreage</b>
Cropland	775,137	Dryland Ag	479,068.54
		Irrigated Ag	296,069.26
Rangeland/Grassland	852,917	Gambel Oak	26,799.26
		Grass Dominated	198,734.96
		Grass/Forb Mix	288,732.50
		Grass/Misc. Cactus Mix	201.95
		Mesic Mountain Shrub Mix	562.52
		Sagebrush Community	7,819.39
		Sagebrush/Grass Mix	262,537.19
		Shrub/Grass/Forb Mix	67,396.42
		Sparse Grass (Blowouts)	51.35
		Sparse PJ/Shrub/Rock Mix	14.99
		Xeric Mountain Shrub Mix	66.04
Forest	23,144	Douglas Fir	10.14
		Douglas Fir/Aspen Mix	10.95
		P. Pine/Gambel Oak Mix	7,795.79
		Ponderosa Pine	14,841.73
		Ponderosa Pine/Aspen Mix	2.82
		Ponderosa Pine/Douglas Fir Mix	478.48
Riparian	55,119	Ponderosa Pine/Mesic Mtn. Shrub	4.63
		Cottonwood	33,257.18
		Forested Riparian	47.22
		Herbaceous Riparian	21,789.57
Water	23,509	Riparian	25.14
Water	23,509	Water	23,509.38
Other	110,993	Barren Land	12.97
		Commercial	46,854.52
		Disturbed Soil	156.73
		Residential	63,557.84
		Rock	51.87
		Soil	22.97
		Talus Slopes & Rock Outcrops	42.99
		Urban/Built Up	269.49
No Data	23.16		
<b>~Total Watershed Acres</b>			<b>1,840,820</b>

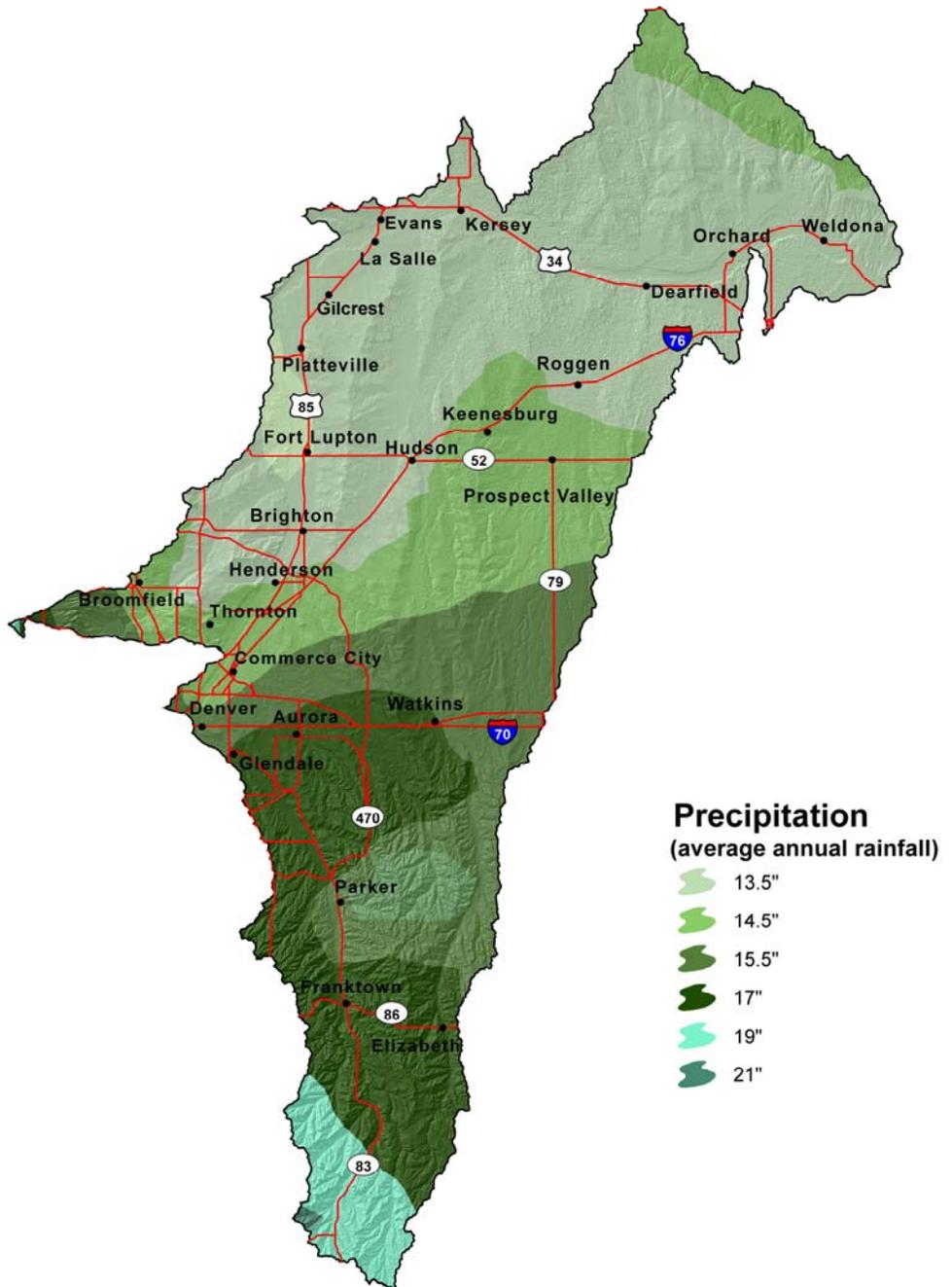
## Precipitation

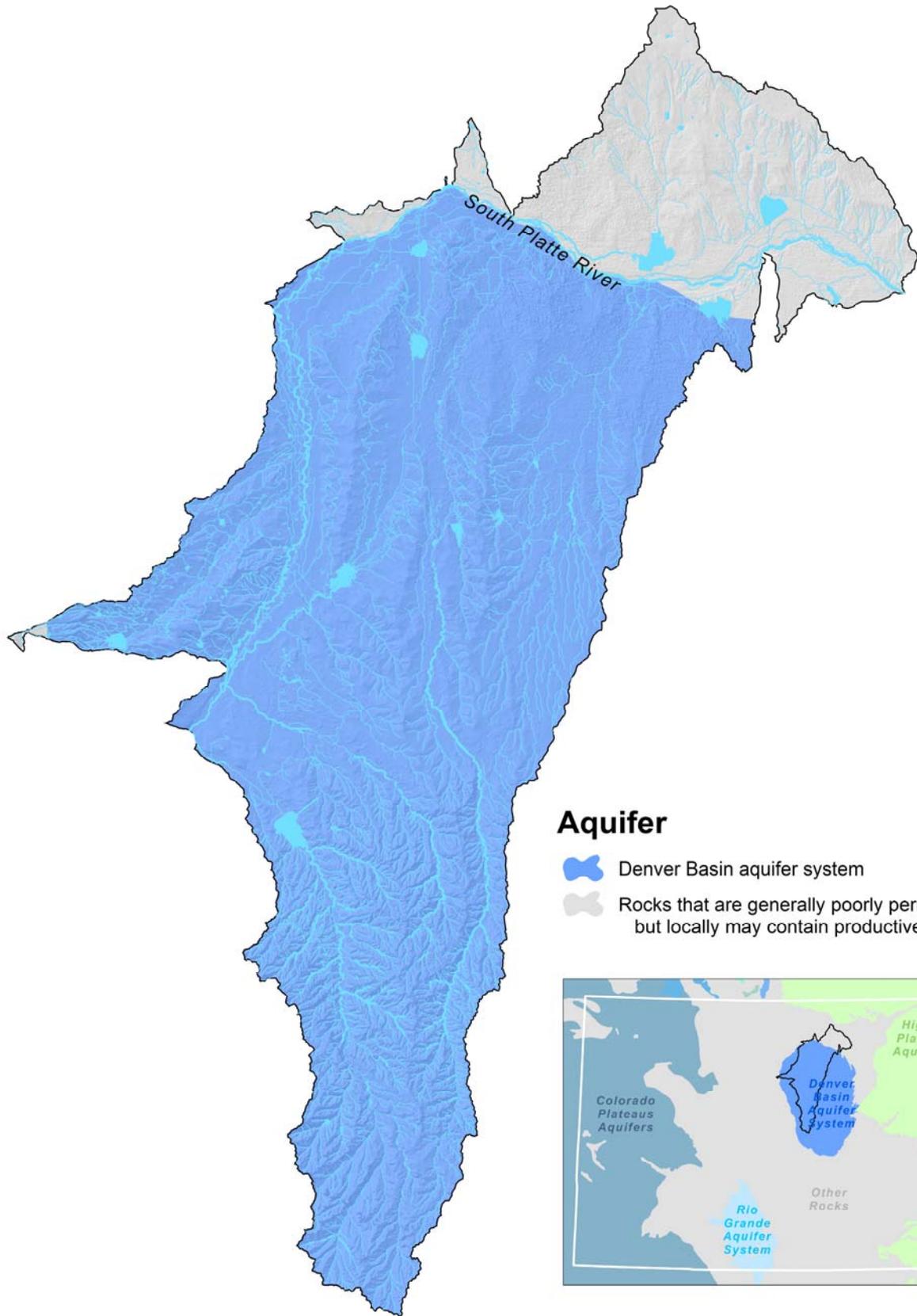
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series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

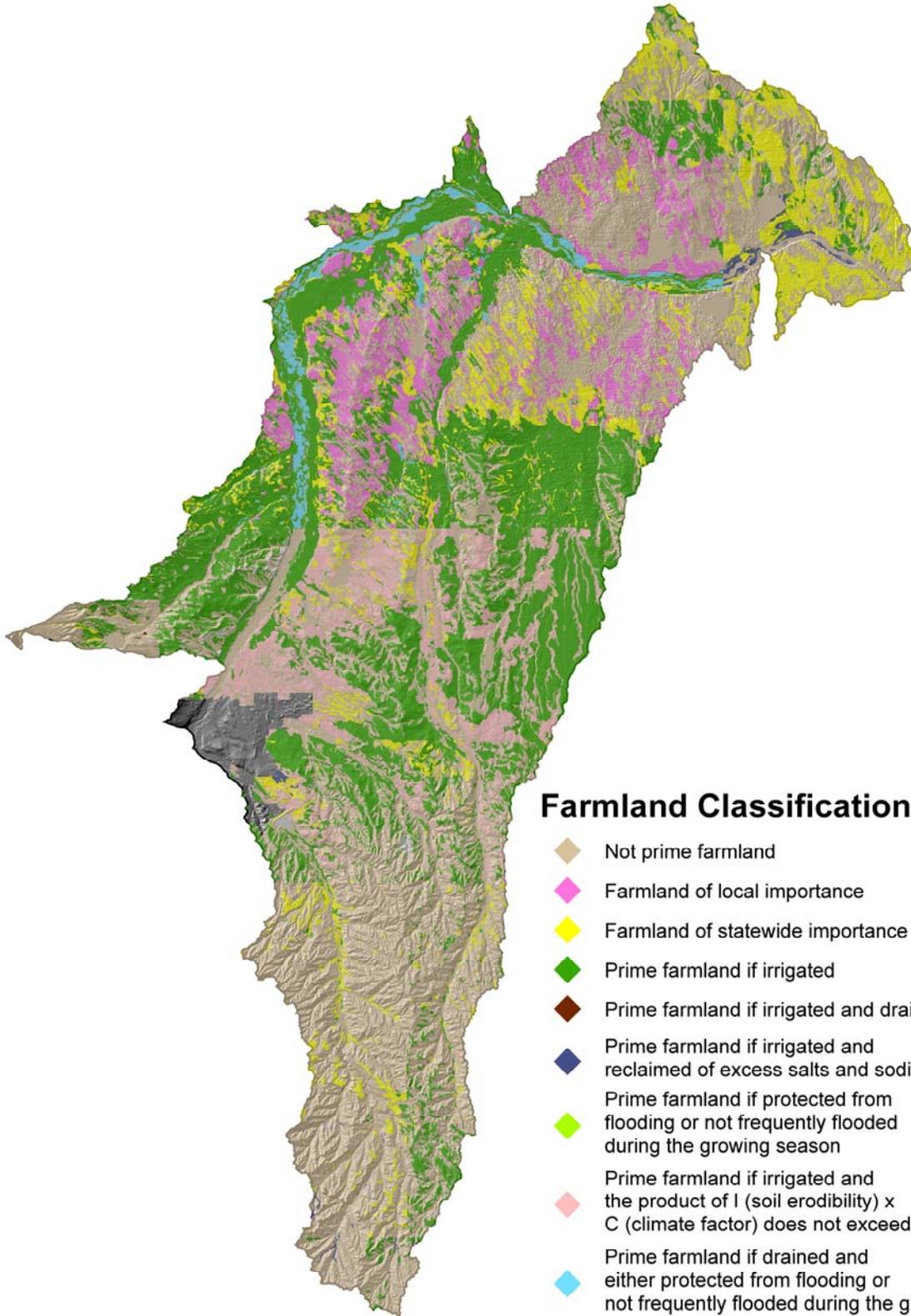
The average annual temperature varies between 48°F and 51°F degrees and ranges between 46°F and 54°F. July is warmest month while December and January are the coolest months. It is not uncommon for the temperatures to reach 100°F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds that produce extreme cold temperatures dropping to -35°F or lower. Winds average about

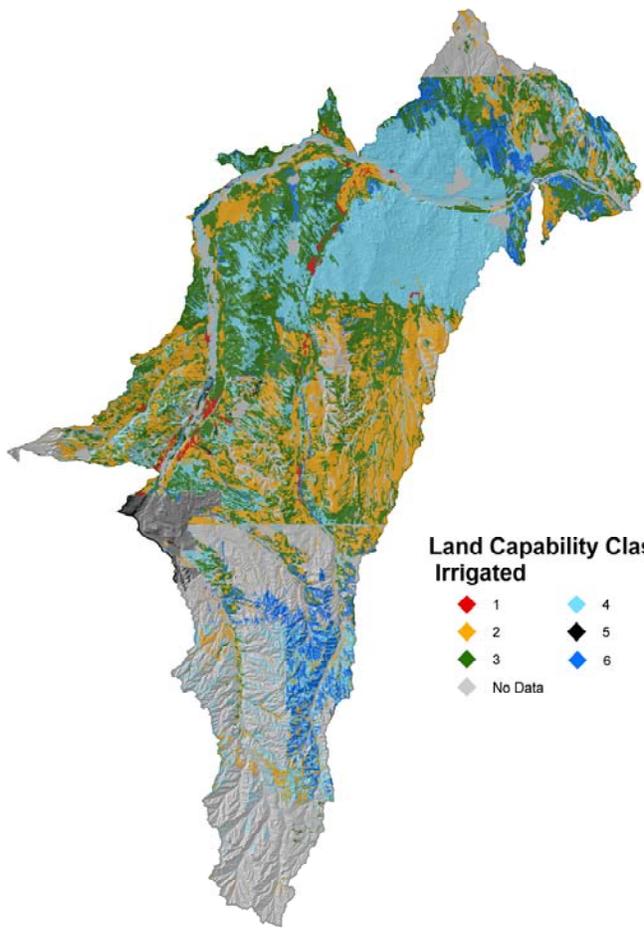
9 to 10 miles per hour annually with daytime winds that are generally stronger than nighttime and occasional strong storms bring periods of high winds with gusts greater than 50 to 90 miles per hour. Rainfall occurs as frontal storms in the spring and early summer and high intensity, convective thunderstorms in late summer. Approximately seventy-five percent of annual precipitation occurs from mid-April through late September. The mean average annual precipitation ranges from 12 to 18 inches per year and ranges from 6 inches to over 29 inches.

Precipitation in winter is snow. The average snowfall ranges from 20 inches to 49 inches but ranges between 4 and 84 inches. The frost free period averages 142 days but ranges from 129 to 155 days. The average date of first frost is in the fall is September 28 and the last frost in the spring is about May 9.









### 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.

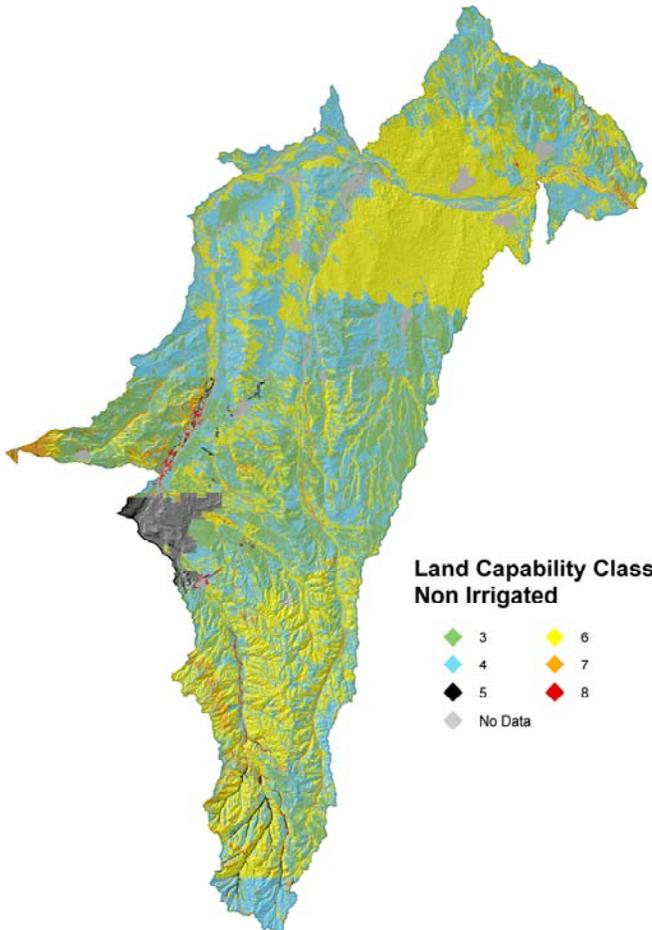
**Class 4** - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

**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.

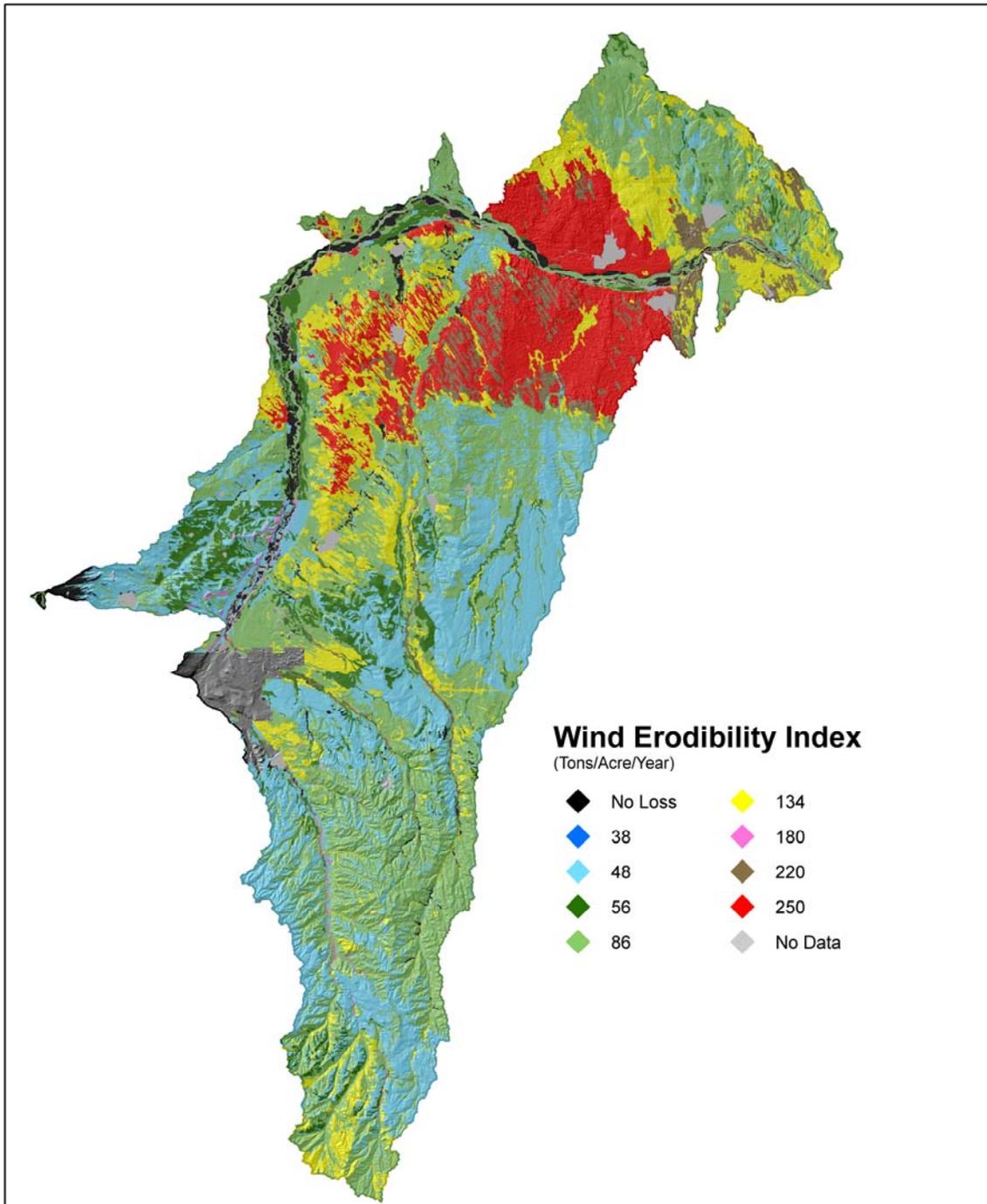


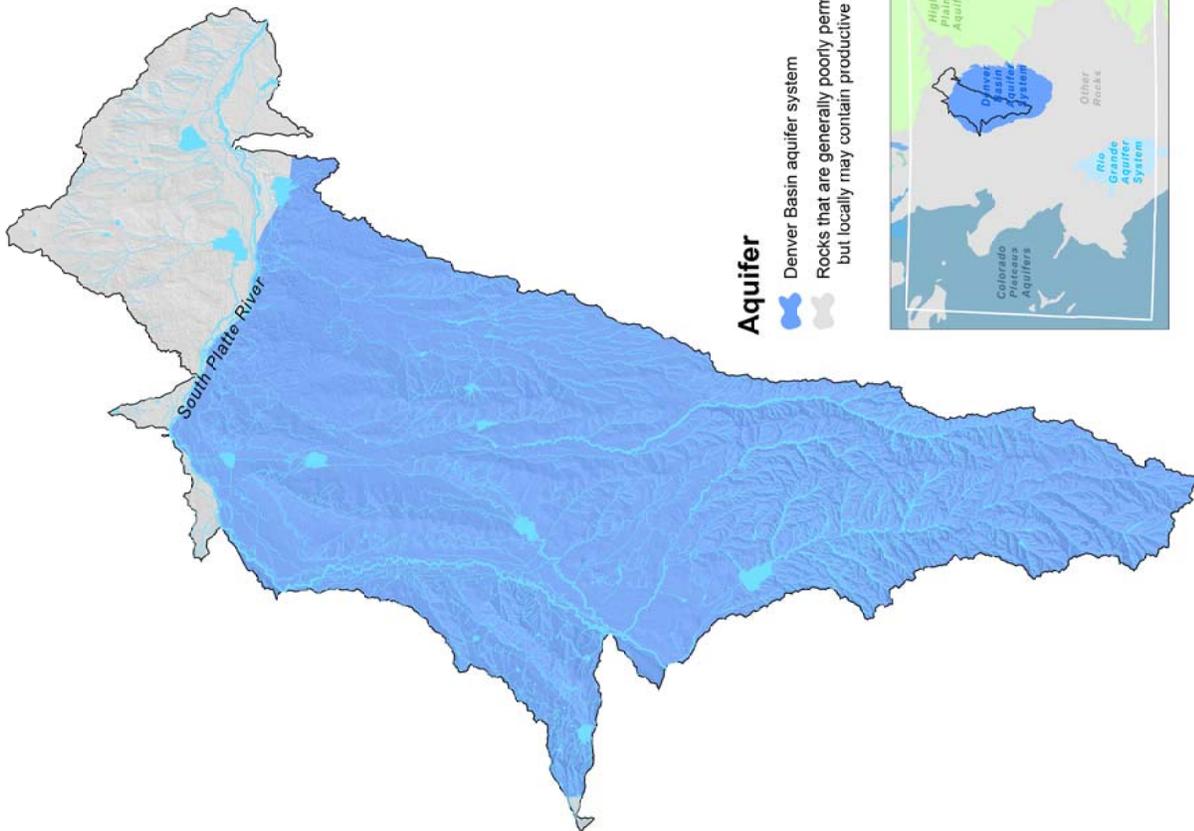
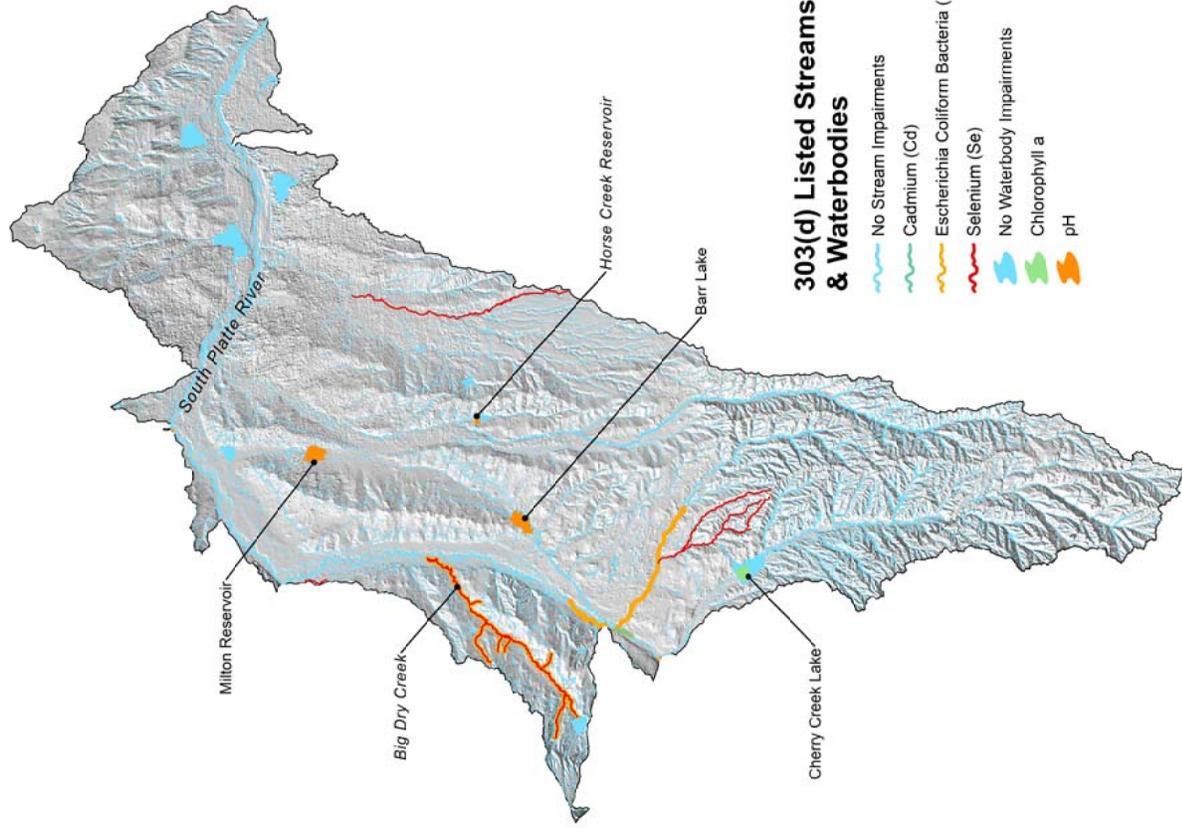
**The Wind Erodibility Index (WEI):**

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 Middle South Platte-Cherry Creek Watershed are considered highly erodible.





## State &amp; Federally Threatened, Endangered &amp; Candidate Species as well as Species of Special Concern

Common Name	Scientific Name	Class	State Status	Federal Status	Comments
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened	None	Roosts and forages in the watershed
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	Mammals	Concern	None	Occurs in the watershed
Brassy Minnow	<i>Hybognathus hankinsoni</i>	Fish	Threatened	None	Occurs in the watershed
Burrowing Owl	<i>Athene cucularia</i>	Birds	Threatened	None	Occurs in the watershed
Common Garter Snake	<i>Thamnophis sirtalis</i>	Reptiles	Concern	None	Occurs in the watershed
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	Concern	None	Occurs in the watershed
Iowa Darter	<i>Etheostama exile</i>	Fish	Concern	None	Occurs in the watershed
Least Tern	<i>Sterna antillarum</i>	Birds	Endangered	Endangered	Occurs downstream of watershed; Depletions are a concern here
Mountain Plover	<i>Charadrius montanus</i>	Birds	Concern	None	Occurs in the watershed
Northern Cricket Frog	<i>Acris crepitans</i>	Amphibians	Concern	None	Occurs in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibians	Concern	None	Occurs in the watershed
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Fish	None	Endangered	Occurs downstream of watershed; Depletions are a concern here
Piping Plover	<i>Charadrius melodus</i>	Birds	Threatened	Threatened	Occurs downstream of watershed; Depletions are a concern here
Preble's Meadow Jumping Mouse	<i>Zapus hudsonius preblei</i>	Mammals	Threatened	Threatened	Occurs in the watershed
River Otter	<i>Lontra Canadensis</i>	Mammals	Threatened	None	Occurs along the Platte River
Swift fox	<i>Vulpes velox</i>	Mammals	Concern	None	Occurs in the watershed
Whooping Crane	<i>Grus Americana</i>	Birds	Endangered	Endangered	Occurs downstream of watershed; Depletions are a concern here

A mixture of short, mid, and tall grass prairie, and sand dunes are the dominant, non-cropland, terrestrial habitat types in this watershed. The southeastern part of the Denver metropolitan area is in this watershed, creating habitat for human tolerant species such as red fox, coyote, and American robin. Both irrigated and dry cropland are common in the watershed. Water is somewhat scarce and the native species in this watershed are those that can survive without abundant water supplies. Riparian areas, playa lakes, irrigation reservoirs, flood control reservoirs, and stock ponds provide aquatic habitats. Economically important wildlife species that occur in much of the watershed include green sunfish, mule and/or white-tailed deer, and mourning dove. Bobwhite quail and Rio Grande wild turkey occur in a limited area in the South Platte River riparian area. Pheasants and snow geese use the northern half of the watershed. Pronghorn (antelope) occur in the eastern half of the watershed. Black bear, mountain lion, and elk are found in the southern part of the watershed.

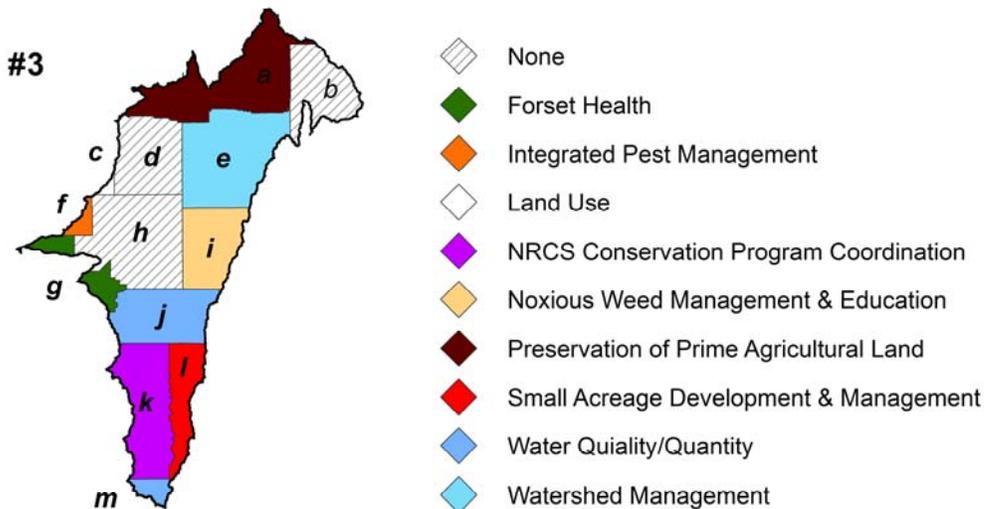
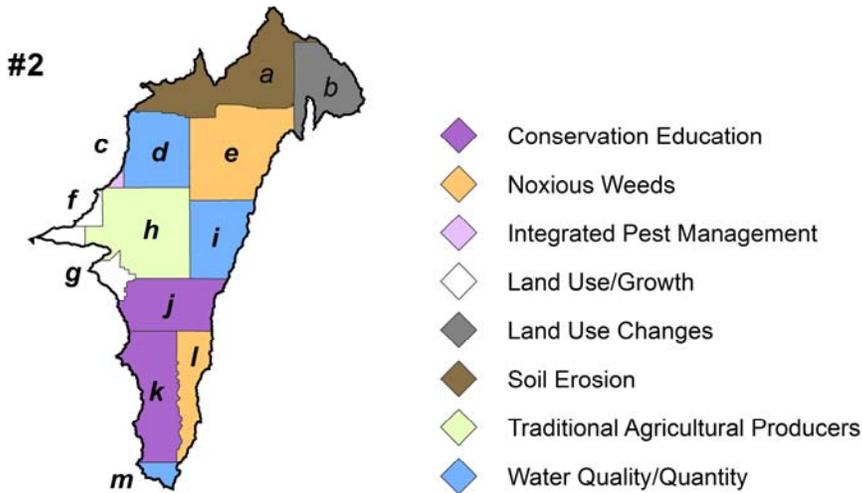
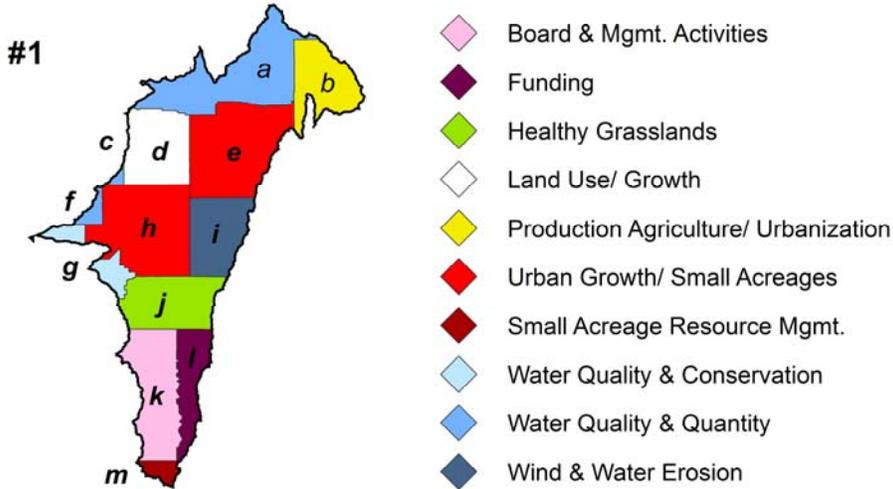
<b>Social Data</b>	<b>Adams</b>	<b>Arapahoe</b>	<b>Douglas</b>	<b>Morgan</b>	<b>Elbert</b>	<b>Jefferson</b>	<b>Weld</b>
<b>Demographics (US Census, American Factfinder)</b>							
Total population	396,032	254,207	248,950	27,171	19,872	519,071	223,966
Male	200,836	258,572	124,213	13,613	9,966	257,684	112,848
Female	195,196	265,635	124,737	13,558	9,906	261,387	111,118
Median age (years)	31.2	34.8	32.9	33.5	37.2	38.8	31.3
White	297,986	410,747	225,373	21,642	18,923	461,995	200,942
Black or African American	12092	48,874	3530	91	128	4380	754
American Indian and Alaska Native	3945	4,180	991	221	125	2457	1465
Asian	14128	24,931	8045	47	74	13581	2427
Native Hawaiian and Other Pacific Islander	66	719	224	46	18	65	117
Some other race	55810	21,919	4655	4449	255	22965	14814
Hispanic or Latino (of any race)	138940	85,131	16205	8473	766	66263	62792
<b>Economic Characteristics (US Census, American Factfinder)</b>							
In labor force (population 16 years and over)	213,189	292,087	140,132	12,422	11,056	293,688	120,817
Median household income (dollars)	50,650	54,838	87,670	34,568	62,480	60,944	48,763
Median family income (dollars)	56,053	67,456	99,531	39,102	66,740	73,355	57,009
Per capita income (dollars)	22,228	30,170	37,931	15,492	24,960	30,163	21,981
Families below poverty level	x	x	x	592	145	x	x
Individuals below poverty level	x	x	x	3281	791	x	x
X means that value is not applicable or not available							
<b>County Agricultural Characteristics (Colorado Agricultural Census, county data tables)</b>							
Farms (number)	728	448	903	761	1153	457	3121
Land in farms/ranches (acres)	701,471	332,585	199,491	757,946	1,068,359	90,366	1,812,167
Average size farm/ranch (acres)	964	742	221	996	927	198	581
Median size farm (acres)	159	82	55	385	160	35	158
Average age of farmer or rancher	54.6	53.1	55	52.9	52.8	55.1	53.5
Net cash return from ag sales (\$1,000)	6,721	1,897	-3,441	18,627	108	6,568	67,959
Cattle and calves (number)	10,000	6,000	4,000	242,000	36,000	2,000	505,000

# Identified Long Range Resource Concerns

## Top Three Concerns within Conservation Districts

*Conservation Districts*

- a West Greeley*
- b Morgan*
- c Longmont*
- d Platte Valley*
- e Southeast Weld*
- f Boulder Valley*
- g Jefferson*
- h East Adams*
- i Deer Trail*
- j West Arapahoe*
- k Douglas County*
- l Kiowa*
- m El Paso*



## Selected Conservation Application Data

Practices	FY 2004	FY 2005	FY 2006	FY 2007	Total
Irrigation Water Management (ac)	7,937	1,253	3,556	2,641	15,387
Prescribed Grazing (ac)	27,576	8,848	8,311	11,618	56,353
Conservation Crop Rotation (ac)	7,933	8,676	13,881	7,513	38,003
Windbreak/Shelterbelt Establishment (ft)	42,212	35,849	13,470	55,696	147,227
Residue Management (ac)	9,103	8,741	13,019	6,438	37,301

## 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 543,503 acres need to be treated on median sized ranches of 2,350 acres.		Reference Conservation System Guide Code: <a href="#">CO 67B.1-GR-01-R-Grazing</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost per Median Sized Ranch (\$)
Prescribed Grazing				
Fence (382)	Ft.	12,400	0.7	8,680
Pest Management (595)	500 Ac.	1	4,500	4,500
Pipeline (516)	Ft.	10,000	1.45	14,500
Upland Wildlife Habitat Management (645)	Ac.	300	na	0
Watering Facility (614)	No.	4	800	3,200
Windbreak/Shelterbelt Establishment (380)	Ft.	1350	.45	608
Costs to apply prescribed grazing per median sized ranch of 2,350 acres	No.	231		31,488

Subtotal Rangeland costs: \$ 7,273,728

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

Primary Resource Concern: Water Quality				
Conservation System Description:		Upgrading Sprinkler irrigation system with IWM, Crop rotation, Nutrient and Pest Mgt.		Reference Conservation System Guide Code: <a href="#">CO 67B.1-CR-Pivot-R-1.1</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation Water Management (449)* * includes re-bowl, renozzle, and IWM	Ac	65,000	34.20	2,223,000
Nutrient Management (590)	Ac	70,000	15	1,050,000
Pest Management (595)	Ac	70,000	15	1,050,000
Conservation System Description:		Surface irrigation converted to sprinkler system. Sprinkler irrigation system with IWM, Crop rotation, Nutrient and Pest Mgt.		Reference Conservation System Guide Code: <a href="#">CO 67B.1-CR-Pivot</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Irrigation System, Sprinkler (442)	Ac	112,000	600	67,200,000
Irrigation Water Management (449)	Ac	67,000	5	335,000
Nutrient Management (590)	Ac	124,000	11.5	1,426,000
Pest Management (595)	Ac	124,000	15	1,860,000
<b>Subtotal Irrigated Crops:</b>				<b>\$70,821,000</b>

Primary Resource Concern: Soil Erosion By Wind on Dryland Crops				
Conservation System Description:		Seasonal residue management with Conservation crop rotation, Nutrient and Pest Mgt		Reference Conservation System Guide Code: <a href="#">CO 67B.1-CR-Dryland-R-2</a>
Practices	Unit	Quantity	Cost/Unit (\$)	Estimated Cost (\$)
Residue Mgmt (344)	Ac	228,150	5	140,750
Nutrient Management (590)	Ac	228,150	5	140,750
Pest Management (595)	Ac	228,150	15	422,250
Windbreak/Shelterbelt Establishment	Ft	500,000	3.5	1,750,000
<b>Subtotal Costs Dryland Crops:</b>				<b>\$2,327,050</b>

**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.	7,273,728
Irrigated Crop	Water		Efficiency of water use. Salt load reduction.	70,821,000
Dryland Crop	Soil	1,026,675 Total Tons/ Year saved	Cropland sustainability	2,327,050
Estimated Total Costs to Address Major Resource Concerns:				\$80,421,778

## FOOTNOTES/ BIBLIOGRAPHY

**303(d)** listed streams within the 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.cdphs.state.co.us/regulations/wqccregs/100293wqlimitedsegtmdls.pdf>.

Stream data from National Hydrologic Dataset <http://nhd.usgs.gov>

**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>.

**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:

- Adams County Area (CO001) Published 01/11/2008
- Arapahoe County (CO005) Published 01/25/2008
- Morgan County (CO087) Published 11/28/2006
- Weld County N (CO617) Published 12/14/2005
- Weld County S (CO618) Published 12/14/2005
- Castle Rock Area (CO622) Published 12/16/2005
- Elbert County W (CO623) Published 12/20/2006
- El Paso County Area (CO625) Published 12/19/2005
- Golden Area (CO641) Published 12/15/2005
- Boulder County Area (CO643) Published 12/21/2006

**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.

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