



United States Department
of Agriculture

Vermillion Watershed



Hydrologic Unit Code 14040109

Natural Resources
Conservation Service

Lakewood, Colorado

Rapid Assessment

RWA 14040109

July 2010



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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.

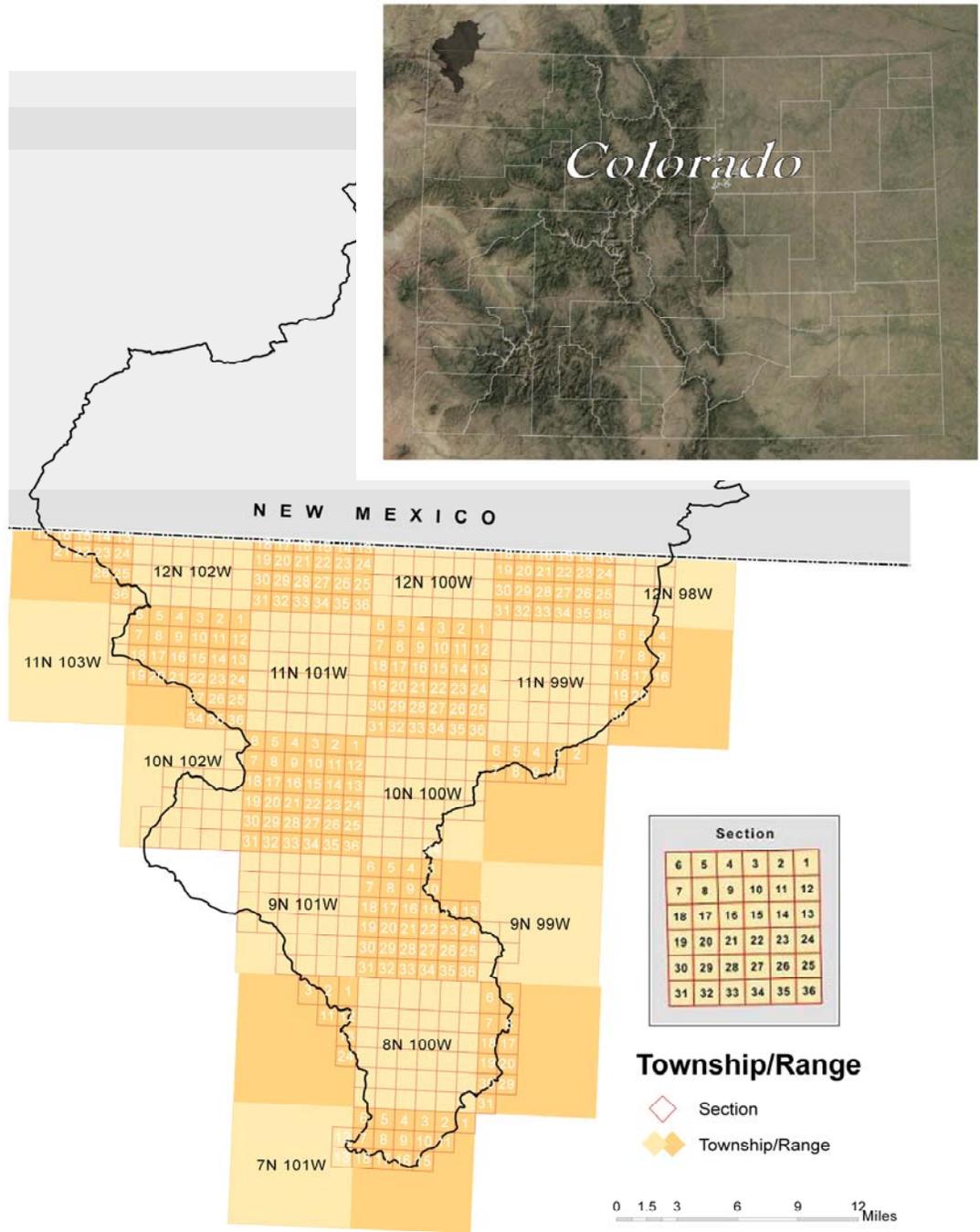
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best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

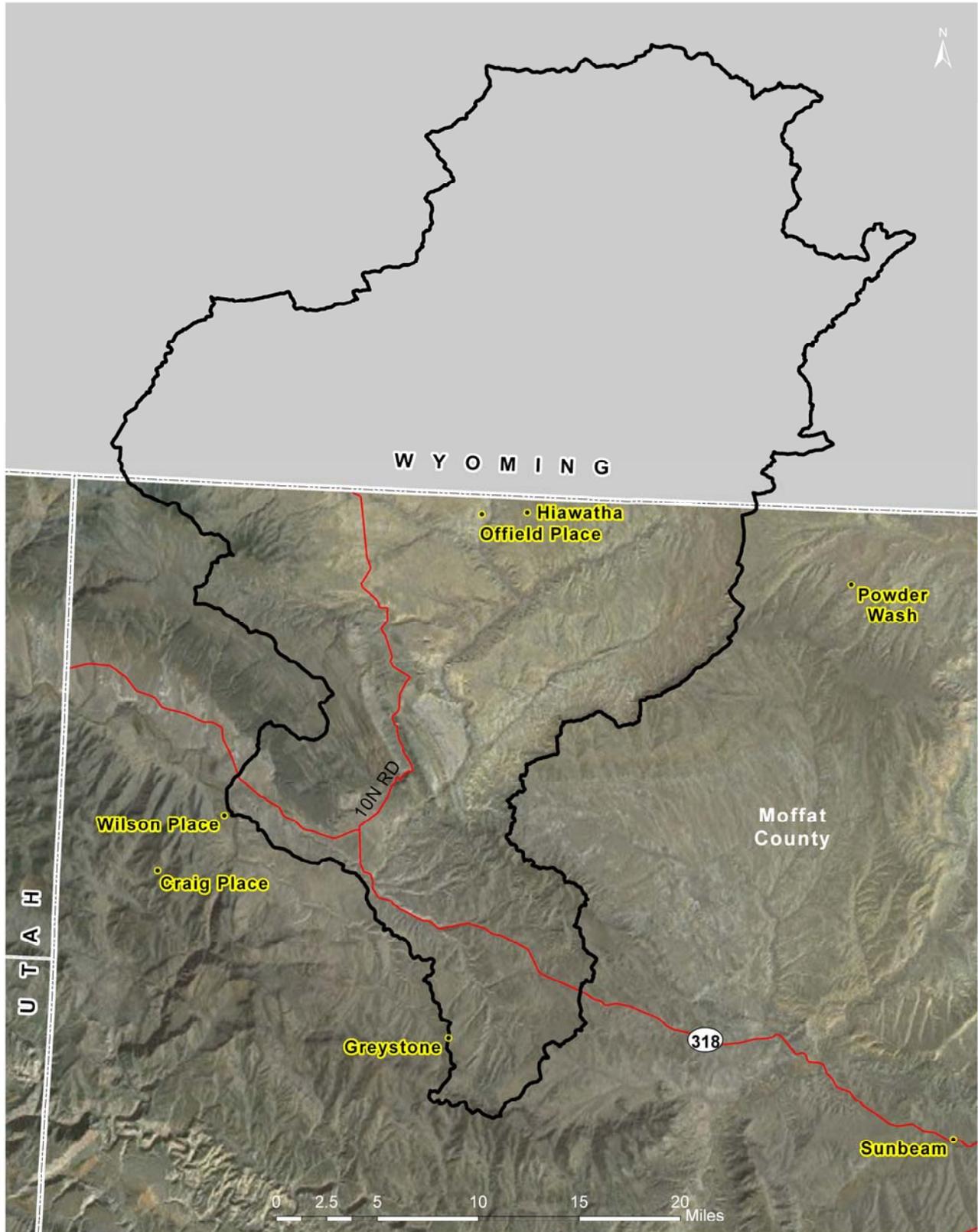
Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.



County	County Acres	County Acres in VERMILLION Watershed	% of County in the Watershed	% of Watershed in the County
Moffat	3,043,713	288,198	9.5%	46.1%

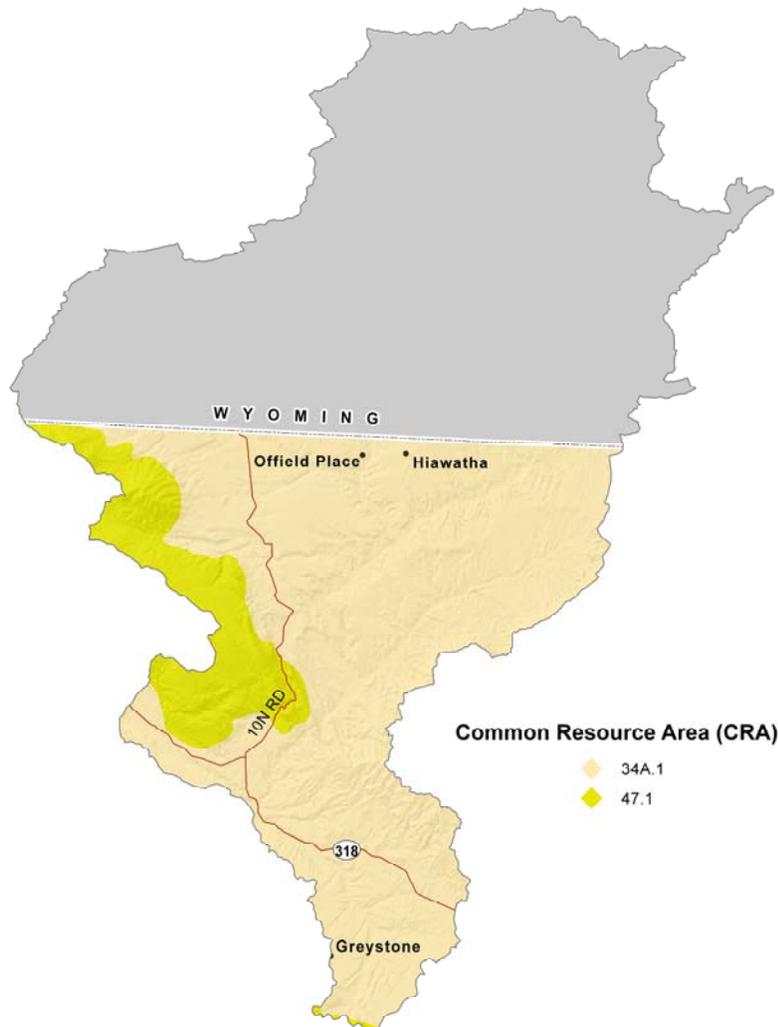
624,629

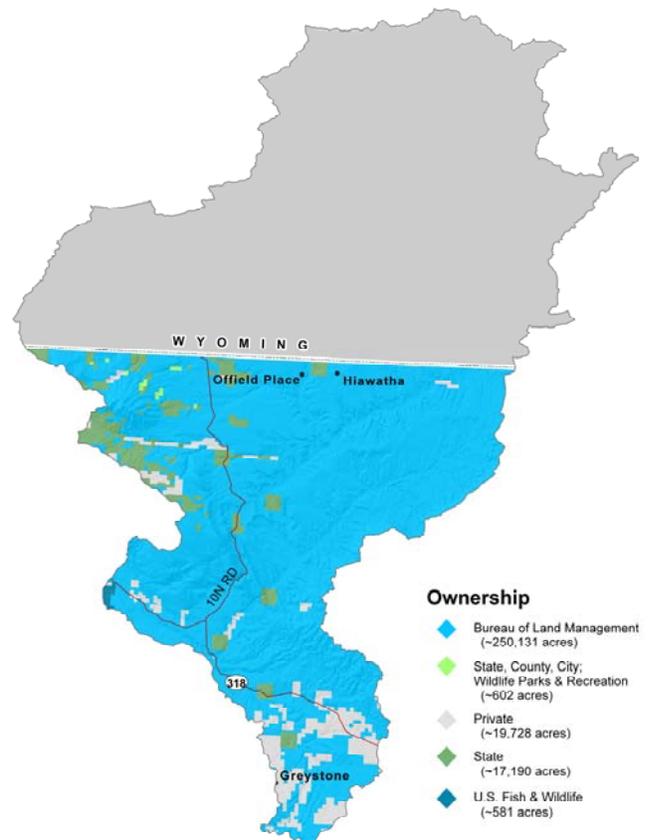
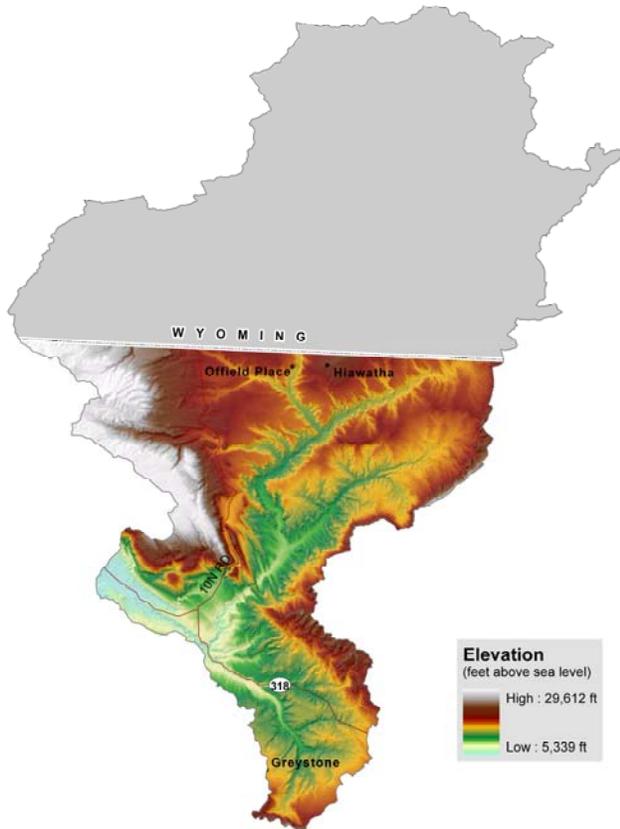
Vermillion Watershed - 14040109

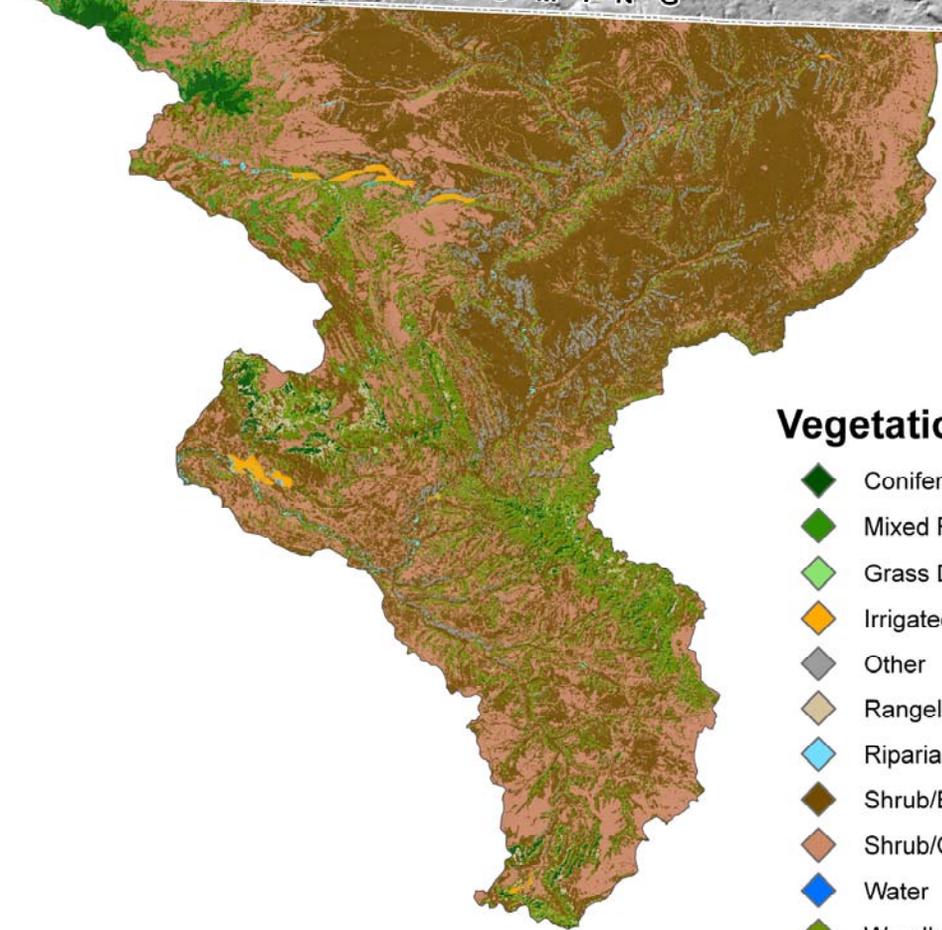
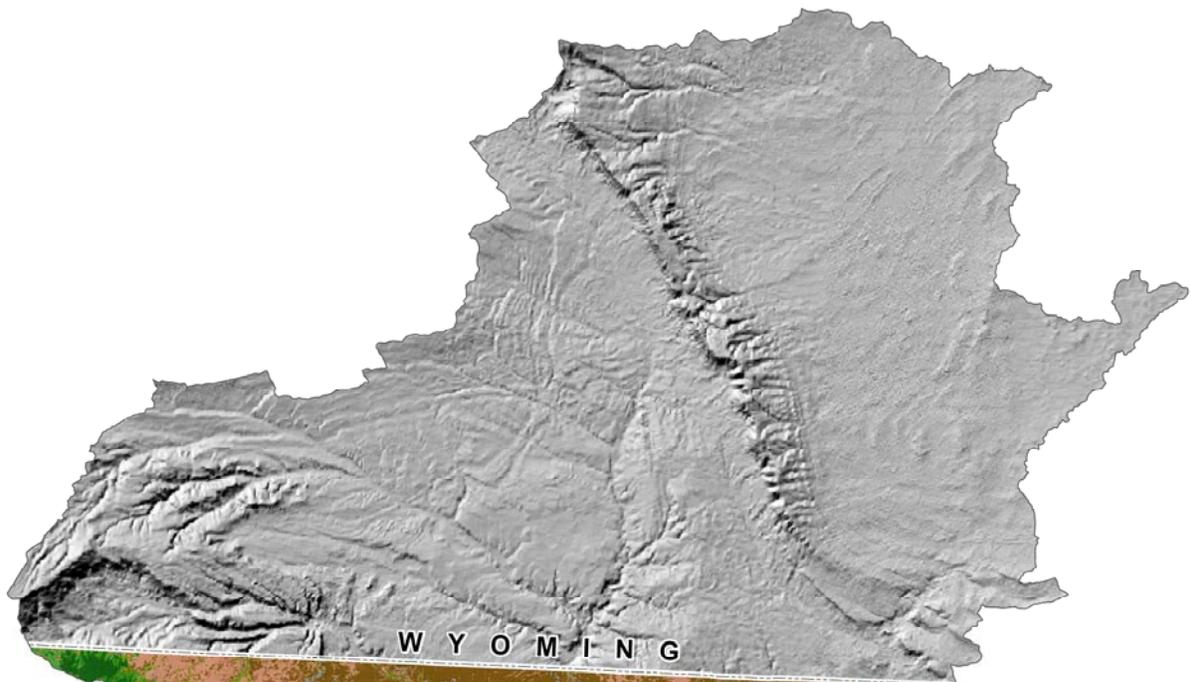


Common Resource Area Descriptions

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. Ele-
47	47.1	Wasatch and Uinta Mountains - Low Mountains and Foothills; Utah, Wyoming, and Colorado	This unit is in the gently sloping to steep semiarid low mountains and hills in the Wasatch and Uinta Mountains. Soils have xeric or ustic moisture regimes with frigid or cryic temperature regimes. Precipitation ranges from 10 to about 18 inches. Elevations are about 5,000 to 8,000 feet. Range and cropland are the predominant land uses.







Vegetation

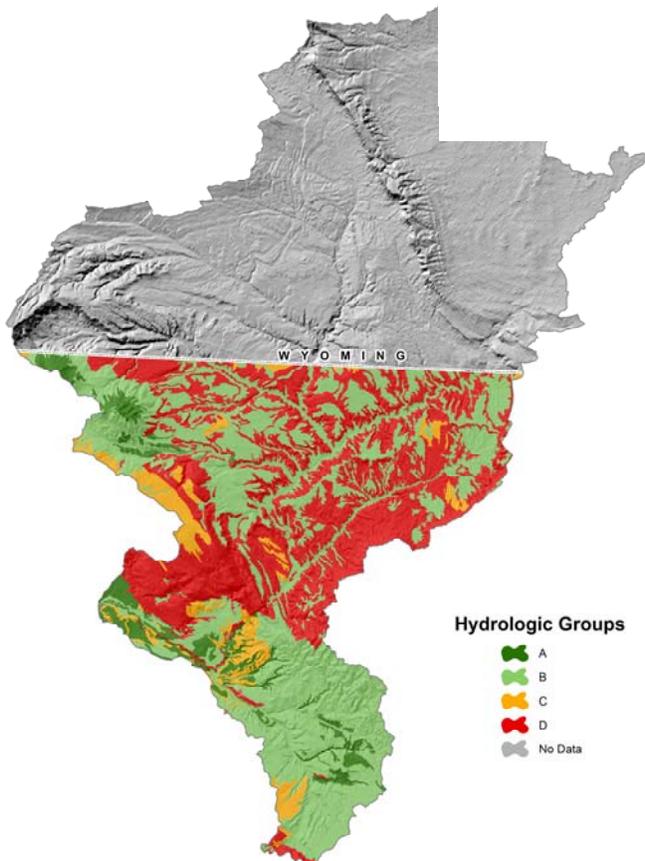
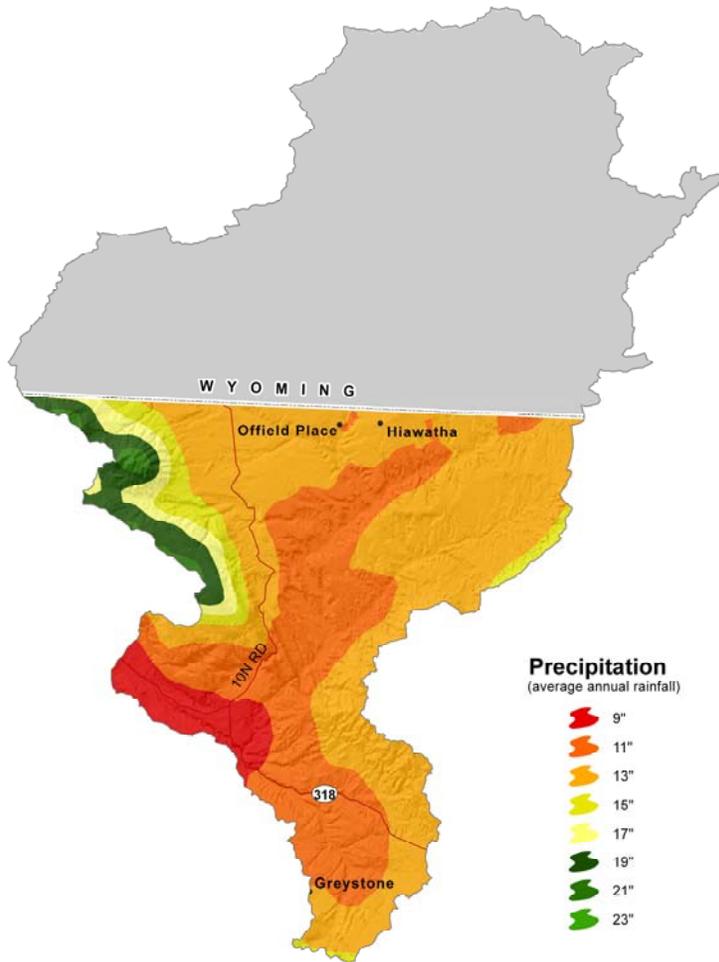
- ◆ Coniferous Forest
- ◆ Mixed Forest
- ◆ Grass Dominated
- ◆ Irrigated Ag
- ◆ Other
- ◆ Rangeland
- ◆ Riparian
- ◆ Shrub/Brush Rangeland
- ◆ Shrub/Grass/Forb Mix Rangeland
- ◆ Water
- ◆ Woodland

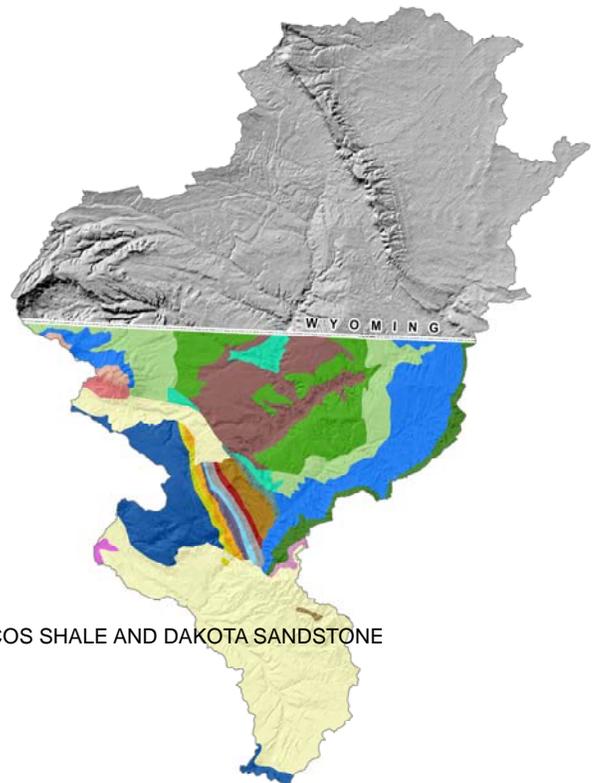
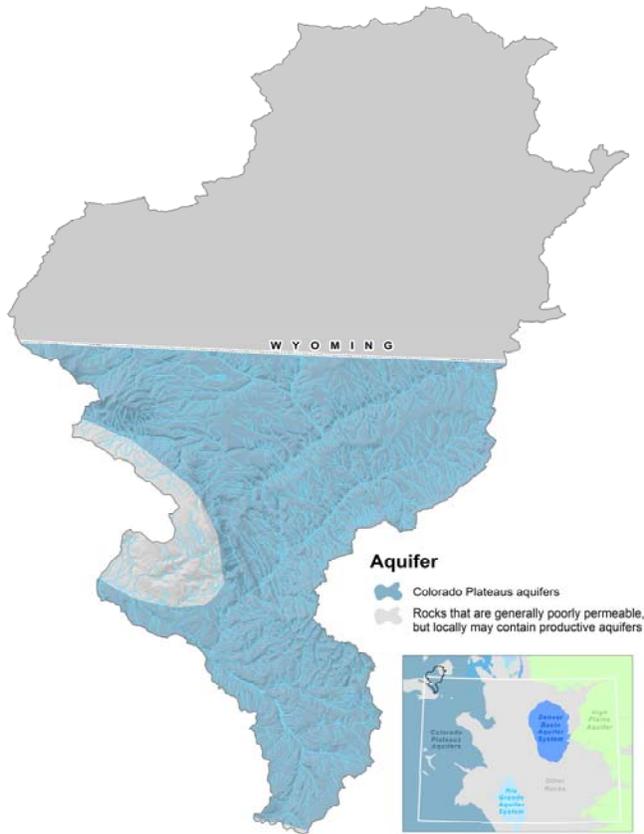
<u>VERMILLION WATERSHED</u> <u>Land Use</u>	Total Acreage	Vegetation	Acreage
Cropland	1,275	Irrigated Ag*	1,275.0
Rangeland/Grassland	267,465	Bitterbrush Community	1,683.3
		Bitterbrush/Grass Mix	606.2
		Grass Dominated	367.9
		Grass/Forb Mix	2,907.3
		Greasewood	5,550.5
		Juniper	1,257.9
		Juniper/Sagebrush Mix	12,186.8
		Manzanita	185.9
		Mesic Mountain Shrub Mix	5,378.6
		PJ-Mtn Shrub Mix	4,360.2
		PJ-Sagebrush Mix	5,144.7
		Pinon-Juniper	3,109.8
		Sagebrush Community	44,736.6
		Sagebrush/Grass Mix	83,188.5
		Sagebrush/Greasewood	3,776.4
		Sagebrush/Mesic Mtn Shrub Mix	492.2
		Salt Desert Shrub Community	31,805.4
		Saltbush Community	47,252.3
		Serviceberry/Shrub Mix	95.0
Shrub/Brush Rangeland	2,965.6		
Sparse Juniper/Shrub/Rock Mix	7,961.4		
Sparse PJ/Shrub/Rock Mix	2,452.8		
Forest	5,650	Aspen	1,636.5
		Aspen/Mesic Mountain Shrub Mix	711.0
		Douglas Fir	198.6
		Lodgepole Pine	247.3
		Lodgepole Pine/Aspen Mix	253.6
		Lodgepole/Spruce/Fir Mix	1,911.2
		Ponderosa Pine	378.7
		Spruce/Fir/Lodgepole/Aspen Mix	312.7
Riparian	1,411	Cottonwood	70.3
		Forested Riparian	108.6
		Herbaceous Riparian	827.6
		Shrub Riparian	72.1
		Willow	332.5
Water	31	Water	31.0
Other	12,307	Rock	25.3
		Soil	12,281.5
~Total Watershed Acres			288,138.7

* Colorado Decision Support Systems Data

Precipitation

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





Geology

- ◆ BRIDGER FORMATION
- ◆ BROWNS PARK FORMATION
- ◆ CHINLE, MOENKOPI, AND PARK CITY FORMATIONS
- ◆ Cathedral Bluffs Tongue
- ◆ FRONTIER SANDSTONE AND MOWRY SHALE MEMBERS OF MANCOS SHALE AND DAKOTA SANDSTONE
- ◆ LANDSLIDE DEPOSITS
- ◆ Laney Member
- ◆ Luman Tongue
- ◆ MADISON LIMESTONE (MISSISSIPPIAN)
- ◆ MANCOS SHALE
- ◆ MESAVERDE GROUP, UNDIVIDED
- ◆ MODERN ALLUVIUM
- ◆ MORGAN FORMATION (LIMESTONE, SANDSTONE, AND SHALE) AND ROUND VALLEY LIMESTONE
- ◆ MORRISON FORMATION
- ◆ MORRISON, CURTIS, ENTRADA, AND GLEN CANYON FORMATIONS
- ◆ Niland Tongue
- ◆ OLIGOCENE SEDIMENTARY ROCKS
- ◆ Tipton Tongue
- ◆ UINTA MOUNTAIN GROUP (AGE 950-1,400 M.Y.)
- ◆ WASATCH FORMATION
- ◆ WEBER SANDSTONE

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.

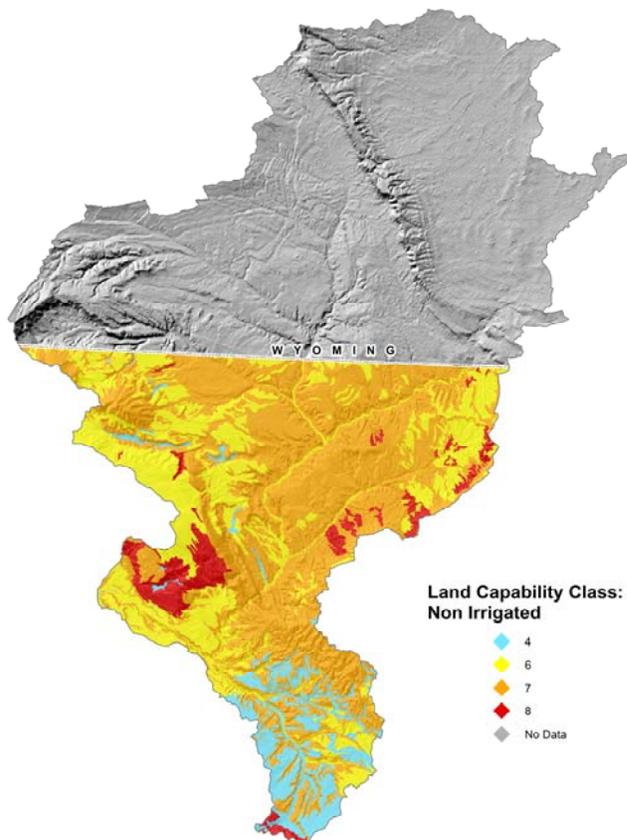
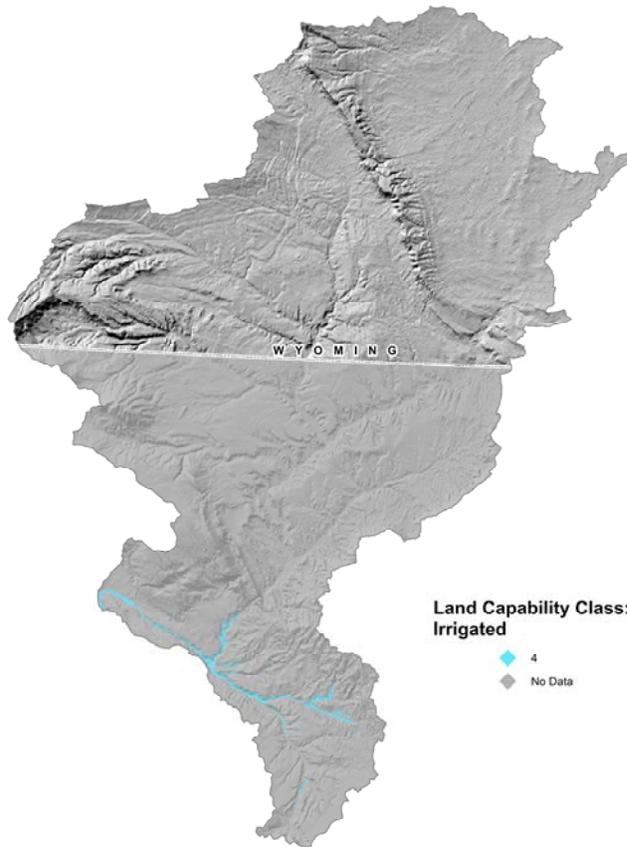
Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

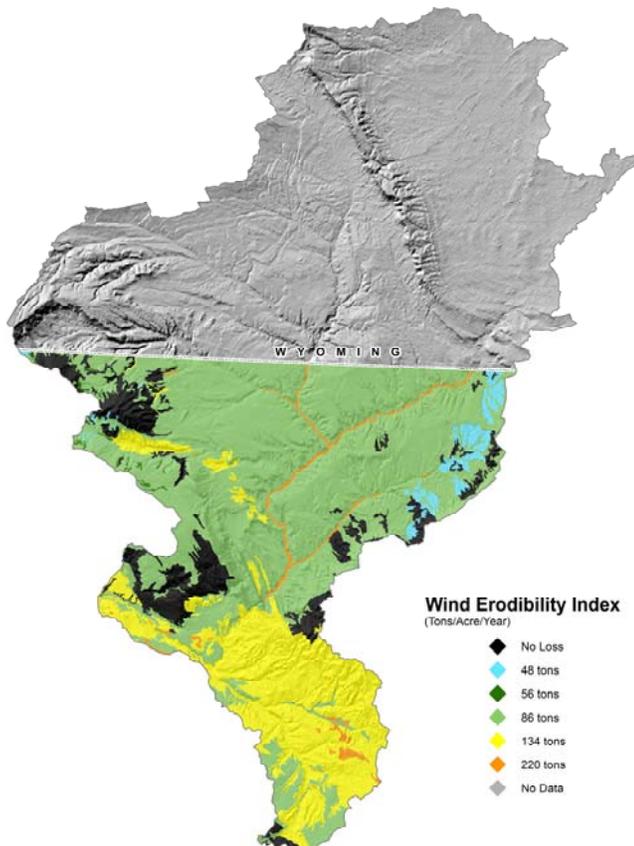
Class 5 - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

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.

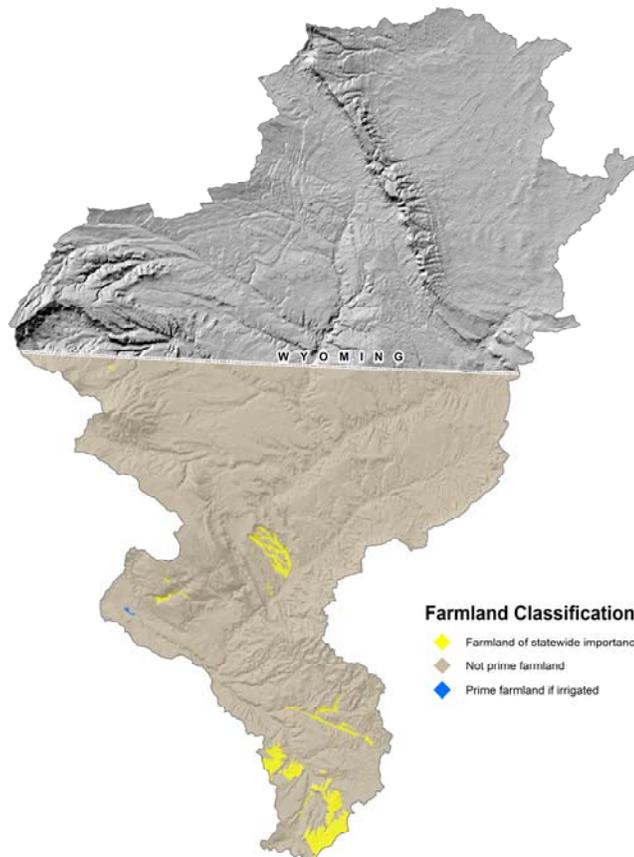
Class 8 - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.





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.



State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Lower White 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	Occurs in the watershed
Black-footed Ferret	<i>Mustela nigripes</i>	Mammals	Endangered/Endangered	May occur in the watershed
Bonytail	<i>Gila elegans</i>	Fish	Endangered/Endangered	Critical habitat in the watershed
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Fish	Threatened/Endangered	Critical habitat in the watershed
Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered/Threatened	May occur in the watershed
Colorado Roundtail Chub	<i>Gila robusta</i>	Fish	Concern/None	Occurs in the watershed
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	Birds	Concern/None	Occurs in the watershed
Humpback Chub	<i>Gila cypha</i>	Fish	Threatened/Endangered	Critical habitat in the watershed
Mountain Sucker	<i>Catostomus platyrhynchus</i>	Fish	Concern/None	Occurs in the watershed
Northern Leopard Frog	<i>Rana pipiens</i>	Amphibians	Concern/None	Occurs in the watershed
Razorback Sucker	<i>Xyrauchen texanus</i>	Fish	Endangered/Endangered	Critical habitat in the watershed
Townsend's big-eared bat (pale ssp)	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern/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 are composed primarily of shrubs with extensive acreage of big sagebrush, saltbush, and pinyon-juniper; and some desert shrub and bitterbrush habitats. Small amounts of lodgepole pine and aspen comprise the forested habitats. Riparian areas and stock ponds provide aquatic habitats in the watershed.

Economically important species in the watershed include: elk, mule deer, mountain lion, pronghorn, and sport fish throughout most of the watershed; black bear and bighorn sheep in the western part of the watershed; and moose in Vermillion Creek, its major tributaries, and associated riparian areas.

Social Data	Moffat
Demographics (US Census, American Factfinder)	
Total population	13,184
Male	6,836
Female	6,348
Median age (years)	35.4
White	12,341
Black or African American	28
American Indian and Alaska Native	116
Asian	44
Native Hawaiian and Other Pacific Islander	3
Some other race	418
Hispanic or Latino (of any race)	1247
Economic Characteristics (US Census, American Factfinder)	
In labor force (population 16 years and over)	6,875
Median household income (dollars)	41,528
Median family income (dollars)	45,511
Per capita income (dollars)	18,540
Families below poverty level	249
Individuals below poverty level	1086
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)	
Farms (number)	443
Land in farms/ranches (acres)	1,017,612
Average size farm/ranch (acres)	2,297
Median size farm (acres)	400
Average age of farmer or rancher	52.7
Net cash return from ag sales (\$1,000)	1,407
Cattle and calves (number)	32,000

Identified Long Range Resource Concerns

Top Three Concerns within Conservation Districts

#1



Conservation Districts
a Colorado First

◆ Water Issues

#2



◆ Weed Control

#3



◆ Rangeland

Selected Conservation Practices Applied, FY 2005 through FY 2009

Practice Code	Practice Name	Practice Unit	Applied Amount	Applied Count
645	Upland Wildlife Habitat Management	ac	14,625	23
449	Irrigation Water Management	ac	0	0
528	Prescribed Grazing	ac	14,625	23

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

Grazed Rangeland—The grazing Resources need improved plant condition (similarity index), productivity, health and vigor. Animals need feed, forage, and shelter. The animals are adapted to the climatic and ecological condition of the resources.

CO 34.1-GR-01

<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
314 Brush Management 338 Prescribed Burning 378 Pond 382 Fence 528 Prescribed Grazing 574 Spring Development 595 Pest Management 614 Watering Facility 645 Upland Wildlife Habitat Management 666 Forest Stand Improvement	This area encompasses the lower elevation mesas and Plateaus that represent the transition to the Southern Rocky Mountains. The typical vegetation is a scattered overstory of two needle pinyon and Utah juniper with a understory of big sagebrush and perennial bunchgrasses. In some areas pinyon and juniper can increase and become a dominant species.	Fish and Wildlife - T&E Species: Declining Species, Species of Concern Plant Condition - Productivity, Health and Vigor Soil Erosion - Sheet and Rill Soil Erosion - Wind

Hayland—Wild flood irrigation system converted to Structure for Water Control, Underground & Gated Pipeline, IWM, and Forage Harvest Mgt.

CO 34.1-HY-Pipe—R-1

<i>Practices</i>	<i>Description</i>	<i>Resource Concerns Addressed</i>
430DD Irr. Water Conveyance, Pipeline, H 431 Above Ground, Multi-Outlet Pipeline 443 Irrigation System, Surface and Subsurface 449 Irrigation Water Management 511 Forage Harvest Management 587 Structure for Water Control	Cool season grasses, alfalfa, or alfalfa/grass hay. Annual precipitation ranges from 8 - 20". Moisture usually lacking in the summer during peak ET and supplemented with gravity irrigation, the water source may be ground or surface water; rainfall often comes in short intense spring and early summer storms and as snowfall in the winter. Wildlife potential for use by elk, deer and other wildlife.	Soil Erosion - Sheet and Rill Soil Erosion - Wind Water Quantity - Inefficient Water Use on Irrigated Land

Estimated Costs of Application of Conservation Systems

Landuse	Estimated Acres Need to be Treated	Estimated Average Cost per Acre (\$)	Costs (\$)
Range	3,000	30	90,000
Hayland	1,000	880	880,000
			Total Costs: \$970,000

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.cdphe.state.co.us/regulations/wqccregs/100293wqlimitedsegtdls.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>. For more information on Colorado's Endangered & Threatened Species, as well as Species of Concern, visit <http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/ThreatenedEndangeredList/ListOfThreatenedAndEndangeredSpecies.htm> or <http://mountainprairie.fws.gov/endspp/CountyLists/COLORADO.htm>

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

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

Moffat County Area (CO686) Published 2/4/2008

Published 1/13/2007 **Vegetation** data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. Completed in 2003, the CVCP is a landscape level vegetation dataset created using Landsat TM imagery and then formatted for GIS use. The species identified are an overview of the most common species associated in each cover type, in order of greatest occurrence. For more information on the Colorado Vegetation Classification Project, visit <http://ndis.nrel.colostate.edu/coveg>.

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

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

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

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

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