Rapid Watershed Assessment
HUC # 14060008- Lower Green River
March 2007

This assessment is designed to gather and display information specific to the eight digit Hydrologic Unit Code #14060008, which includes parts of Emery, Wayne, and Grand Counties in Utah. This report will highlight the natural and social resources present within the HUC boundary, detail specific concerns, and be used to aid in resource planning and target conservation assistance needs. This document is dynamic and will be updated as additional information is available through a multi-agency partnership effort. The general observations and summaries are listed first, followed by some specific resource inventories.

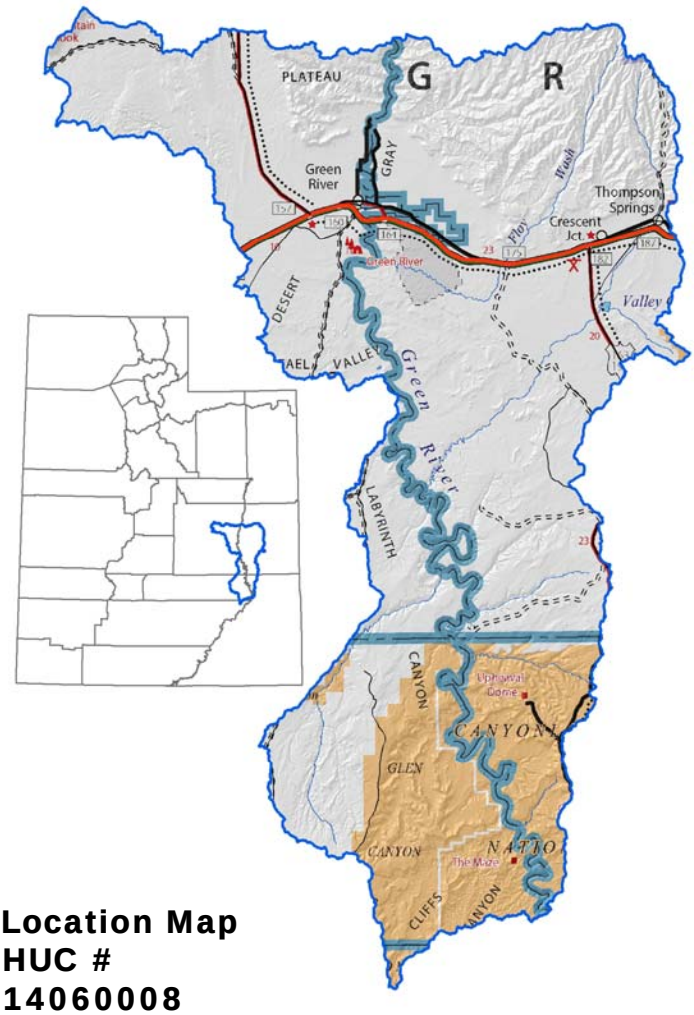
Contents

Introduction

This watershed is located in the middle-eastern part of the state, stretching from the area around the town of Green River south to a portion of Canyonlands National Park. The watershed boundary encompasses 1,194,433 acres.

There are 42,113 acres of private land of which 36,466 acres is farmland of statewide importance. There are 747 acres of Prime farmland if those acres are irrigated. Of the 103 farms in the basin, most farms are between 1 and 179 acres, and about 60% of farms are less than 50 acres. About 70% of farmland is pasture, about 23% is cropland and 7% is of other uses.

There are 1,023,273 acres of federal land in the basin. There are 128,156 acres of state land. Canyonlands National Park. comprises 230,368 acres of the basin in addition to 701 acres of tribal lands.

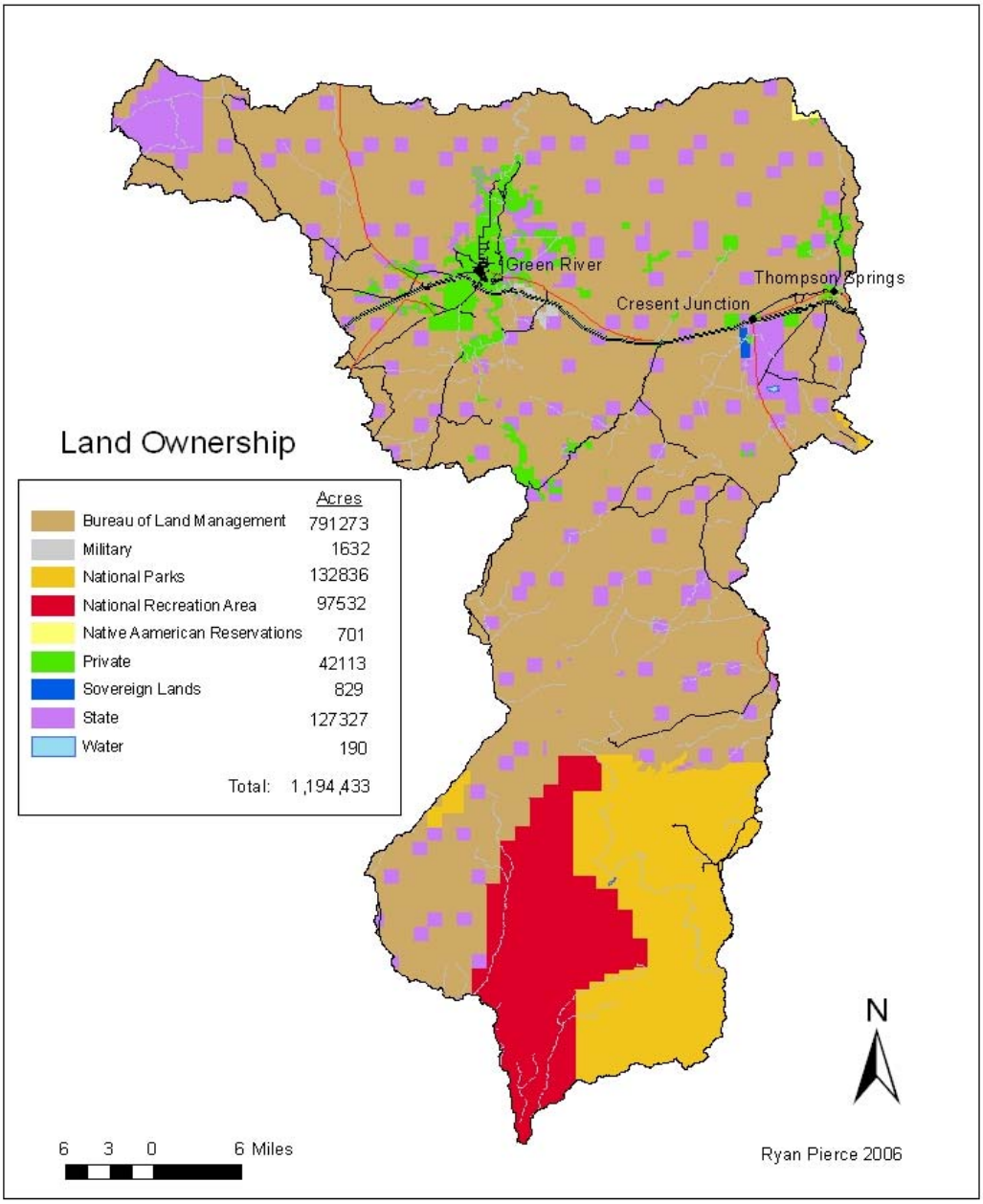


Location Map HUC # 14060008

Objective

Building alliances and partnerships is an important component of successful voluntary conservation programs. This approach is based on encouraging local landowners and stakeholders to take a greater responsibility for managing their resources. This in turn can empower local people, leverage both dollars and human resources, and reduce duplication of personnel and programs across federal, state, and local agencies. The overarching objective of this general assessment is to create a forum in which individual and group interests can be expressed and reconciled, thereby changing the attitudes and behavior of clients and stakeholders.

Lower Green River Watershed



Special Considerations for this HUC area # 14060008:

- There is a push to expand the area used for agriculture around the town of Green River
- Water Rights issues are heightening as the conversion of landuse on private lands is debated
- The area around Green River is known for cantaloupe and watermelon production
- Row crops include a variety of field and vegetable crops grown for the cannery processing and fresh market.
- Shrub/rangelands consist of pinyon, juniper and sagebrush.
- A negligible percent of the watershed is urban
- A portion of the the agriculture ground around the city of Green River produces water melon

Grass / Pasture / Hay Lands

- Complications related to overgrazing include poor pasture condition, soil compaction and water quality issues.
- Control of noxious and invasive plants is an ever increasing problem.
- The small, part-time farms are less likely to adopt conservation due to cost and low farm income.

Row & Perennial (orchards / vineyards / nurseries) Crops

- Residue, nutrient and pest management are needed to control erosion and to protect water quality.
- The small, part-time farms are less likely to adopt conservation due to cost and low farm income.

Forest

- On private, non-industrial forest there are issues with erosion, water quality and forest productivity
- On non-industrial forest land, landowner objectives are not often on actively managing the land for timber production.
- Land use constraints and the lack of economic incentives further discourage conservation
- Since 1973 there have been 75 wildland fires within the basin. Fire management on public lands within the basin is a critical issue

Salinity

- The Green River is a major tributary to the Colorado River. Water diverted from the Green River for municipal, industrial and agricultural uses can impact salinity (dissolved solids) levels of the Colorado River. This issue has broad implications for agricultural/irrigation enterprises within the basin.

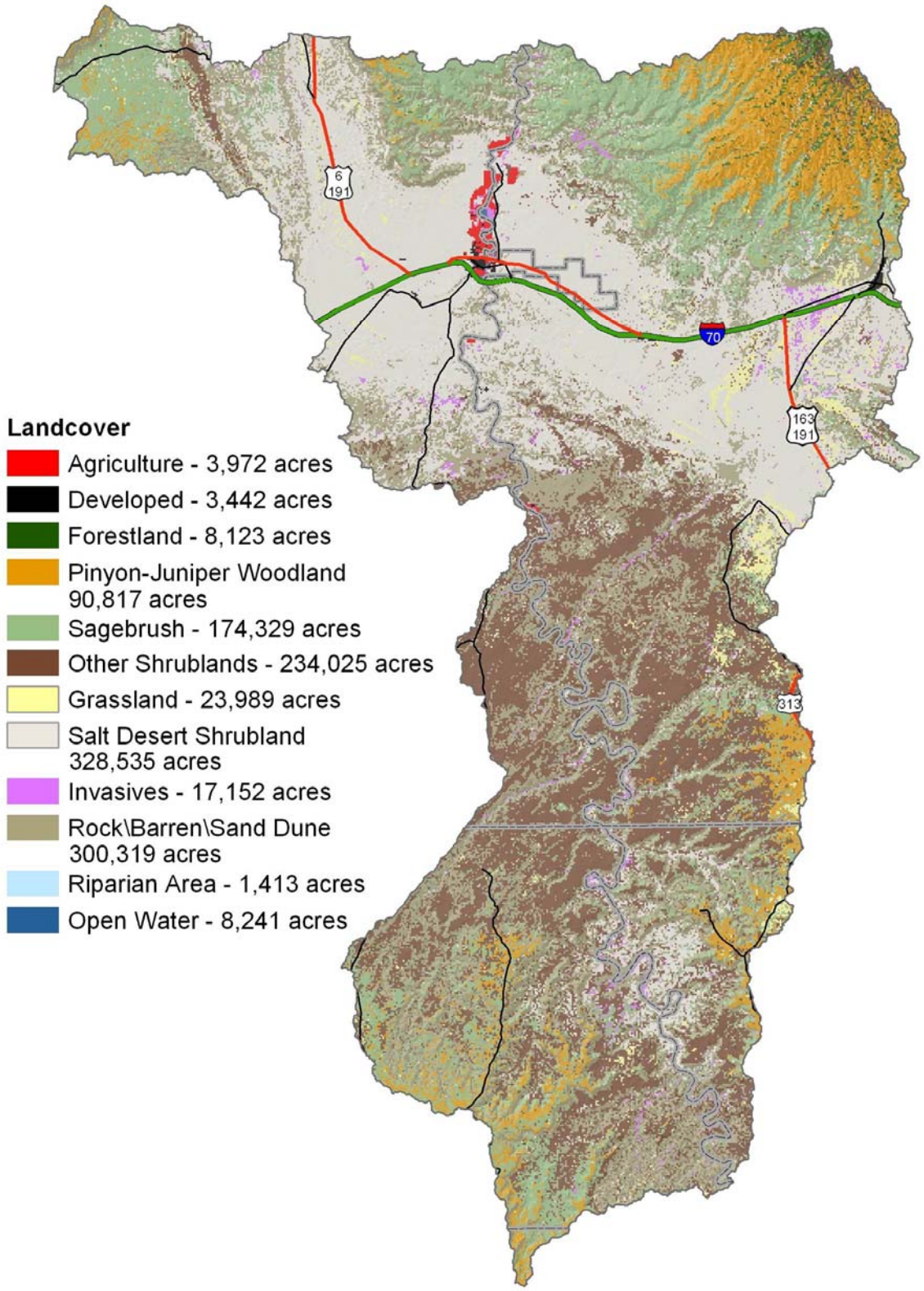
Wildlife-Sensitive/Endangered Species

- There is potential for enhancement of wildlife habitat along the tributaries of the Green River for species that use those corridors for breeding and/or cover.

Resource Assessment Summary

Categories	Concern high, medium, or low	Description and Specific Location (quantify where possible)
Soil	medium	sheet and rill, wind, contaminants and other chemicals
Water Quantity	high	reduced capacity of conveyances by sediment deposition, excessive runoff, flooding, ponding
Water Quality Ground Water	medium	excessive salinity in groundwater
Water Quality Surface Water	high	excessive salinity in surface water; excessive salinity from Colorado River
Air Quality	low	no major concerns
Plant Suitability	low	some plants are not well adapted
Plant Condition	low	noxious and invasive plants
Fish and Wildlife	medium	inadequate water quality and quantity
Domestic Animals	low	inadequate stock water, inadequate quantities and quality of feed and forage
Social and Economic	low	full time vs. part time agricultural communities

Land Use/Cover



Common Resource Area - Map

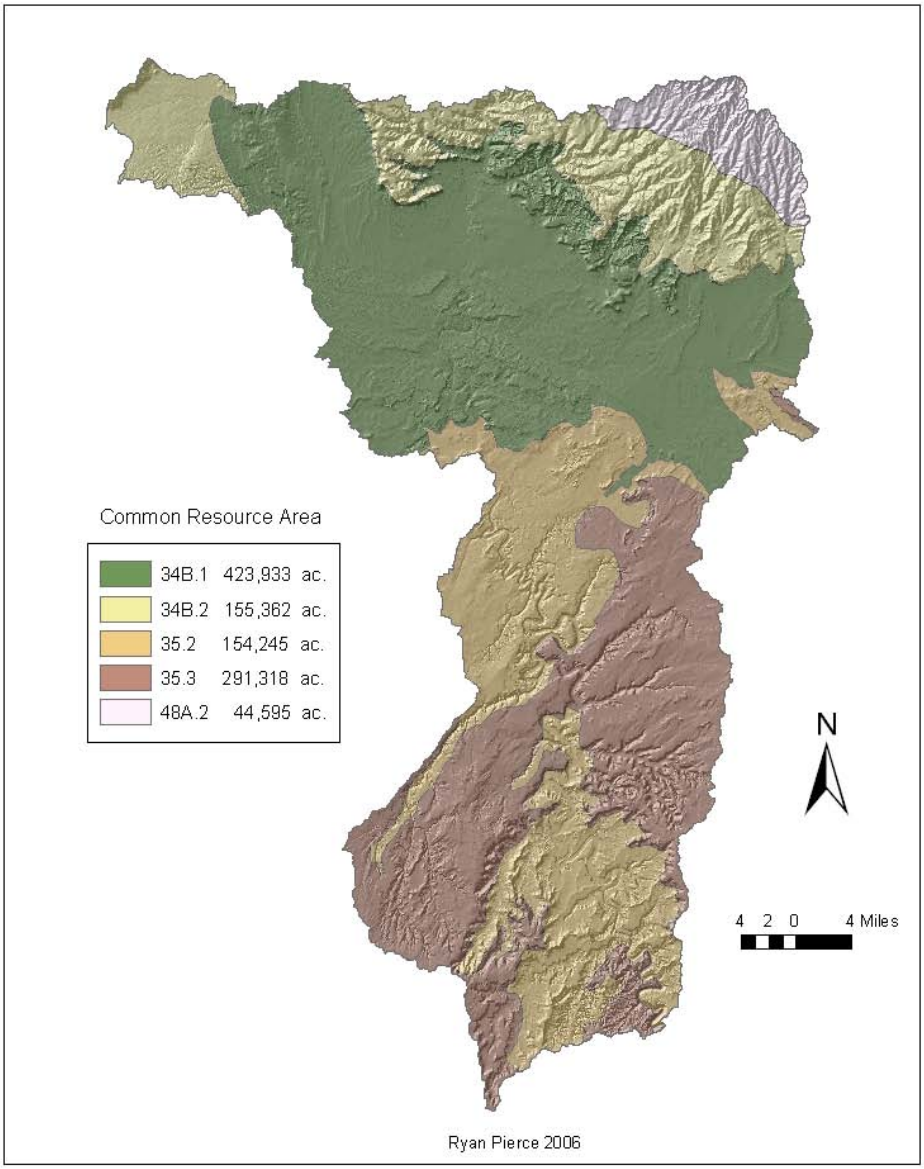
Common Resource Area (CRA) map delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area.

Each Common Resource Area will have multiple Conservation System Guides associated with it. A Conservation System Guide associates, for a given CRA and land use, different components of Resource Management Systems and their individual effect on conserving soil and water resources.

CRA Map Unit Descriptions

34B.1 Warm Central Desertic Basins and Plateaus, Desert Basins and Low Hills
This unit is in the warm desertic parts of the Central Desertic Basins, Mountains, and Plateaus MLRA, south and east of Price. Soils in this unit are in arid basins and are usually well drained, have an aridic moisture regime, and frigid temperature regime and are influenced by the adjacent saline marine shales. Most of the areas are in range. Precipitation is usually less than 10 inches. Elevations are usually less than 6,000 feet.

34B.2 Warm Central Desertic Basins, and Plateaus, Semiarid Rangeland
This unit is in the warm semiarid parts of the Central Basins, and Plateaus, and Low Mountains MLRA, south and east of Price. Soils in this unit are in narrow saline basins and on broad plateaus. Soils are well drained, have an aridic moisture regime, and frigid temperature regime. Major use is range. Precipitation ranges from 10 to 16 inches. Elevations range from about 4,500 to 6,500 feet.



35.2 Desert, Semiarid Low Colorado and Green River Plateaus

This unit is in arid Colorado and Green River Plateaus MLRA. Soils in this unit are in arid basins and low plateaus. They are usually well drained, have an aridic moisture regime, and mesic temperature regime and are influenced by the adjacent saline marine shales. Most of the areas are in range. Precipitation is usually less than 10 inches. Elevations are about 4,000 to 5,200 feet.

35.3 Semiarid, Range, Colorado and Green River Plateaus

This unit is in the warm semiarid parts of the Colorado and Green River Plateaus MLRA in the south and east portions of Utah. Soils in this unit are on broad plateaus. Soils are well drained, have an aridic moisture regime, and mesic temperature regime. Major use is range. Precipitation ranges from 10 to about 16 inches. Elevations range from about 4,500 to 6,500 feet.

34B.3 Irrigated Cropland, Central Desertic Basins and Plateaus

This unit is in the warm desertic basins, and plateaus in irrigated cropland of the Central Desertic Basins, Mountains, and Plateaus MLRA, south and east of Price. Soils are normally well drained, have an aridic moisture regime, and frigid temperature regime. Irrigation is mostly for forage production and small grains and generally has salts as influenced by marine shale deposits. Elevations are usually less than 6,000 feet.

48A.2 Southern Rocky Mountains, Semiarid High Plateaus, Utah and Colorado

This area is a dissected high plateau. The temperature regime is frigid or cryic, and the moisture regime is ustic. Characteristic native vegetation is sagebrush, aspen, and Rocky Mountain Douglas fir. Elevations range from 5,000 to 9,500 feet.

Conservation Progress-Status *(NRCS – Performance Results System)*

Performance Results (PRS) Data	FY01	FY02	FY03	FY04	FY05	Total
Total Conservation Systems Planned (Acres)	110	0	20,000		1,292	
Total Conservation Systems Applied (Acres)	0	0	957		298	
Conservation System Planned					8	
Conservation Systems Applied					4	
Conservation Treatment (Acres)						
Brush Management	0	0			403	
Conservation Crop Rotation	0	0			1,745	
Conservation Cover	0	0			46	
Buffers	0	0				
Erosion Control	0	0				
Irrigation Water Management	0	0			2,054	
Nutrient Management	0	0			95	
Pest Management	0	0				
Prescribed Grazing	0	0			13,050	
	0	0				
Conservation Tillage	0	0				
Wildlife Habitat	0	0				
Waste Management	0	0				
Water Well	0	0			1	

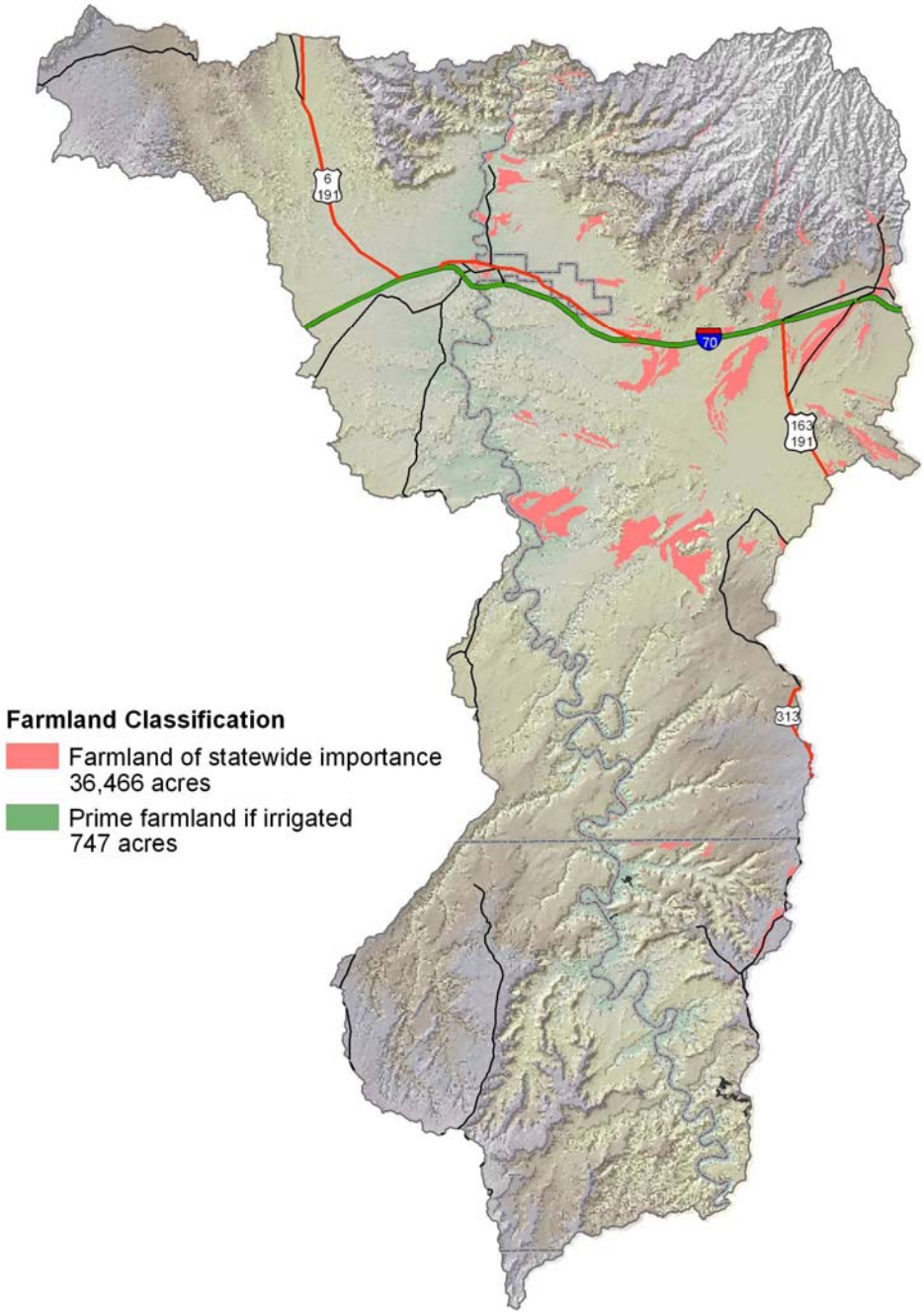
Prime & Unique Farm Land

Prime farmland

Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.

Additional farmland of statewide or local importance

Land identified by state or local agencies for agricultural use, but not of national significance.



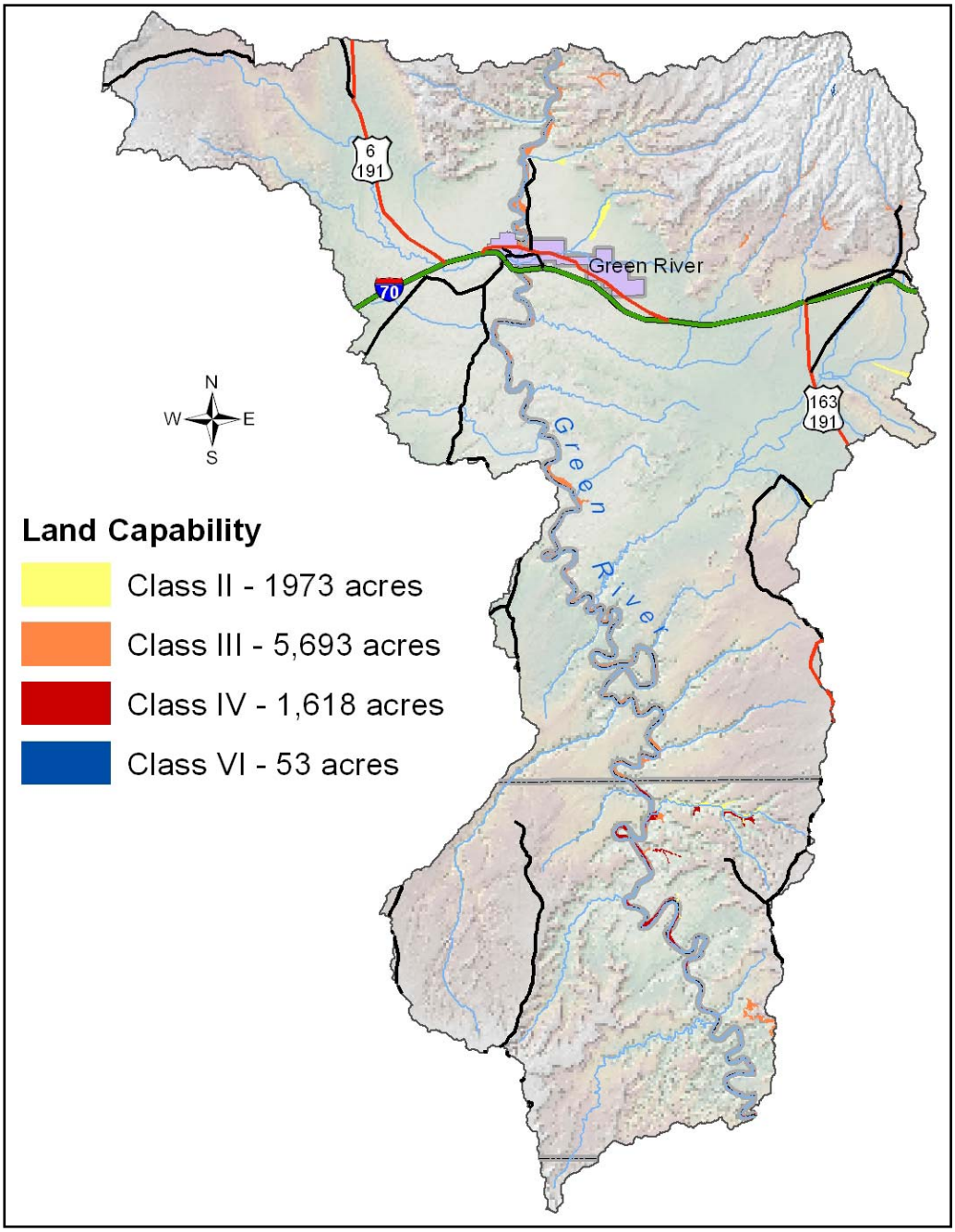
Resource Concerns – SOILS

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Soil Erosion	Sheet and Rill				x	x										
	Wind	x			x	x										
	Ephemeral Gully	x	x	x												
	Classic Gully	x	x	x												
	Streambank								x							
	Shoreline															
	Irrigation-induced	x	x	x												
	Mass Movement															
	Road, roadsides and Construction Sites															
Soil Condition	Organic Matter Depletion	x	x	x												
	Rangeland Site Stability				x	x										
	Compaction	x	x													
	Subsidence															
	ContaminantsSalts and Other Chemicals	x												x		
	Contaminants: Animal Waste and Other OrganicsN															
	Contaminants: Animal Waste and Other OrganicsP															
	Contaminants: Animal Waste and Other OrganicsK															
	Contaminants : Commercial FertilizerN															
	Contaminants : Commercial FertilizerP															
	Contaminants : Commercial FertilizerK															
	ContaminantsResidual Pesticides															
	Damage from Sediment Deposition															

Land Capability Class on Cropland and Pastureland

Land capability classification is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period. Land capability classification is subdivided into capability class and capability subclass nationally.

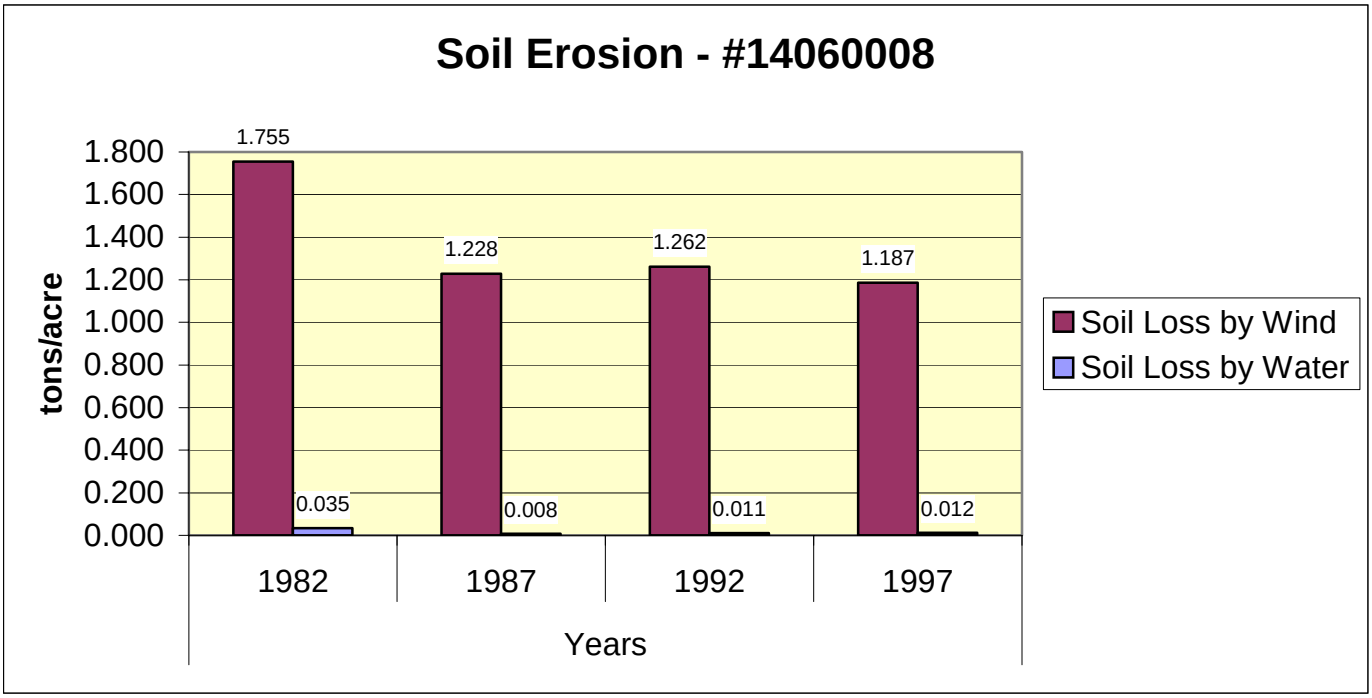
Capability class is the broadest category in the system. Class codes I to VIII indicate progressively greater limitations and narrower choices for agriculture. The numbers are used to represent both irrigated and nonirrigated land capability.



		Acres	Percentage
Land Capability Class (Irrigated Cropland & Pastureland Only)	**I** - slight limitations	0	0%
	II - moderate limitations	1,973	22%
	III - severe limitations	5,380	60%
	IV - very severe limitations	1,618	18%
	V - no erosion hazard, but other limitations	0	0%
	VI - severe limitations, unsuited for cultivation, limited to pasture, range, forest	53	1%
	VII - very severe limitations, unsuited for	0	0%

	cultivation, limited to grazing, forest, wildlife		
	VIII - misc areas have limitations, limited to recreation, wildlife, and water supply	0	0%

Soil Erosion



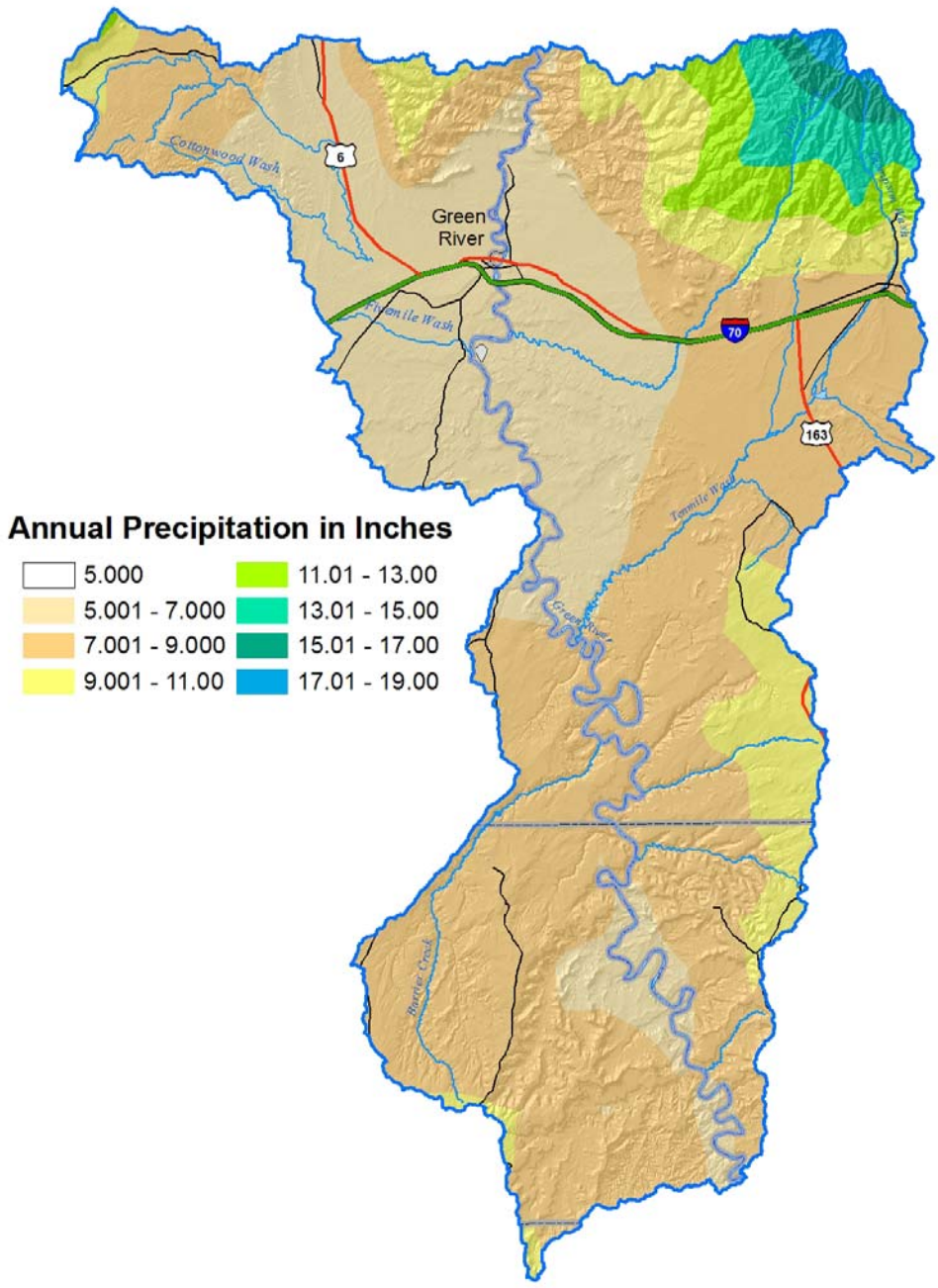
- Sheet and rill erosion by water on the sub basin croplands and pasturelands have been reduced by more than 0.6 tons per acre of soil from 1982 to 1997.
- Controlling erosion not only sustains the long-term productivity of the land, but also affects the amount of soil, pesticides, fertilizer, and other substances that move into the nation's waters.
- Through NRCS programs farmers and ranchers have applied conservation practices to reduce the effects of erosion by wind. As a result, erosion rates on croplands and pasturelands fell 32% from 1.755 to 1.187 tons/acre/year from 1982 to 1997

Resource Concerns – WATER

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Water Quantity	Water Quantity – Rangeland Hydrologic Cycle															
	Excessive Seepage															
	Excessive Runoff, Flooding, or Ponding	x	x	x	x	x	x		x							
	Excessive Subsurface Water															
	Drifted Snow															
	Inadequate Outlets															
	Inefficient Water Use on Irrigated Land															
	Inefficient Water Use on Non-irrigated Land	x	x	x												
	Reduced Capacity of Conveyances by Sediment Deposition															
	Reduced Storage of Water Bodies by Sediment Accumulation															
	Aquifer Overdraft															
	Insufficient Flows in Watercourses															
Water Quality, Groundwater	Harmful Levels of Pesticides in Groundwater															
	Excessive Nutrients and Organics in Groundwater															
	Excessive Salinity in Groundwater	x	x	x	x	x	x									
	Harmful Levels of Heavy Metals in Groundwater															
	Harmful Levels of Pathogens in Groundwater															
	Harmful Levels of Petroleum in Groundwater															
Water Quality, Surface	Harmful Levels of Pesticides in Surface Water															
	Excessive Nutrients and Organics in Surface Water															
	Excessive Suspended Sediment and Turbidity in Surface Water															
	Excessive Salinity in Surface Water	x	x	x	x	x	x									
	Water Quality – Colorado River Excessive Salinity	x	x	x	x	x	x									
	Harmful Levels of Heavy Metals in Surface Water															
	Harmful Temperatures of Surface Water															
	Harmful Levels of Pathogens in Surface Water															
	Harmful Levels of Petroleum in Surface Water															

Precipitation

Precipitation is certainly a limiting factor for agriculture in this basin. The expansion of agriculture is proposed for the valley areas around Green River which is in the five to seven inch rainfall category.



Green River & Salinity

Water in the Green River which is major tributary to the Colorado River is used for municipal and industrial, and agricultural purposes. The use water for agricultural irrigation in excess of the crop needs can increase the transport of dissolved solids to the river. During 2004-05, the U.S. Geological Survey in cooperation with the USDA-Natural Resources Conservation Service investigated the occurrence and distribution of dissolved solids in water from the agricultural areas near Green River, Utah, and in the adjacent reach of the Green River.

Concentration of Dissolved Solids diverted from Green River for irrigation during 2004-05 was **357 mg/liter**

Concentration of dissolved solids from seeps and drains where water was returning to the river during low-flow conditions was **4,170 mg/liter**.

Concentration of dissolved solids from the shallow part of the ground-water system ranged from **687 to 55,900 mg/liter**.

Estimated diversion from the Green River into the Thayne, East Side and Green River canals is 6,600, 6,070 and 19,900 acre-feet respectively. The estimated seepage loss to ground water from the Thayne, East Side and Green River canals for the same period is 1,550, 1,460 and 4,710 acre-feet respectively.

Source: USGS Scientific Investigations Report 2006-5186; http://pubs.usgs.gov/sir/2006/5186/

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		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights	Surface	6,610.00	26,440.00
	Total Irrigated Adjudicated Water Rights	6,610.00	26,440.00
Stream Flow Data	USGS 09315000 Green River at Green River, UT	Total Avg. Yield	376,886
		May-Sept Yield	604,313
Stream Data		**MILES**	**PERCENT**
	Total Miles - Major (100K Hydro GIS Layer)	3,463.11	n/a
	303d (DEQ Water Quality Limited Streams)	55.83	2%

	Irrigation Efficiency:	<40%	40 - 60%	>60%
Percentage of Total Acreage	Cropland	65%	20%	15%
	Pastureland	60%	25%	15%

Watersheds & Total Maximum Daily Load (TMDL)

Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects		**NRCS Watershed Plans, Studies & Assessments**	
Name	**Status**	**Name**	**Status**
		Green River Salinity Study	**planning phase**
DEQ TMDL's		**NRCS Comprehensive Nutrient Management Plans**	
Name	**Status**	**Number**	**Status**
None		1 0	Planned Implemented

AFO/CAFO

Animal Feeding Operations (AFO)						
Animal Type	**Dairy**	**Feed Lot (Cattle)**	**Poultry**	**Swine**	**Mink**	**Other**
No. of Farms	0	5	0	0	0	4
No. of Animals						

Potential Confined Animal Feeding Operations (PCAFO)						
Animal Type	**Dairy**	**Feed Lot (Cattle)**	**Poultry**	**Swine**	**Mink**	**Other**
No. of Farms	0	4	0	0	0	4
No. of Animals						

Confined Animal Feeding Operations - Utah CAFO Permit					
Animal Type	**Dairy**	**Feed Lot (Cattle)**	**Poultry**	**Swine**	**Other**
No. of Permitted Farms	0	0	0	0	0
No. of Permitted Animals					

Resource Concerns – AIR, PLANTS, ANIMALS

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Air Quality	Particulate matter less than 10 micrometers in diameter (PM 10)															
	Particulate matter less than 2.5 micrometers in diameter (PM 2.5)															
	Excessive Ozone															
	Excessive Greenhouse Gas: CO2 (carbon dioxide)															
	Excessive Greenhouse Gas: N2O (nitrous oxide)															
	Excessive Greenhouse Gas: CH4 (methane)															
	Ammonia (NH3)															
	Chemical Drift															
	Objectionable Odors															
	Reduced Visibility															
	Undesirable Air Movement															
	Adverse Air Temperature															
Plant Suitability	Plants not adapted or suited															
Plant Condition	Plant Condition – Productivity, Health and Vigor															
	Threatened or Endangered Plant Species: Plant Species Listed or Proposed for Listing under the Endangered Species Act															
	Threatened or Endangered Plant Species: Declining Species, Species of Concern															
	Noxious and Invasive Plants	x	x	x	x				x					x		
	Forage Quality and Palatability															
	Plant Condition – Wildfire Hazard															
Fish and Wildlife	Inadequate Food															
	Inadequate Cover/Shelter															
	Inadequate Water							x								
	Inadequate Space															
	Habitat Fragmentation							x								
	Imbalance Among and Within Populations															
	Threatened and Endangered Species: Species Listed or Proposed for Listing under the Endangered Species Act	x	x	x	x	x		x	x	x			x	x		
Domestic Animals	Inadequate Quantities and Quality of Feed and Forage				x	x										
	Inadequate Shelter				x	x										
	Inadequate Stock Water															
	Stress and Mortality															

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Noxious Weeds

Utah Noxious Weed List

The following weeds are officially designated and published as noxious for the State of Utah, as per the authority vested in the Commissioner of Agriculture under Section 4-17-3, Utah Noxious Weed Act:

- Bermuda grass** (cynodon dactylon)
- Canada thistle (cirsium arvense)
- Diffuse knapweed (centaurea diffusa)
- Dyers woad (isatis tinctoria L)
- Field bindweed (Wild Morning Glory) (convolvulus arvensis)
- Hoary cress (cardaria drabe)
- Johnson grass (sorghum halepense)
- Leafy spurge (euphorbia esula)
- Medusa head (taeniatherum caput-medusae)
- Musk thistle (carduus mutans)
- Perennial pepper weed (lepidium latifolium)
- Perennial sorghum (sorghum halepense L & sorghum almum)
- Purple loosestrife (lythrum salicaria L.)
- Quack grass (agropyron repens)
- Russian knapweed (centaurea repens)
- Scotch thistle (onopordum acanthium)
- Spotted knapweed (centaurea maculosa)
- Squarrose knapweed (centaurea squarrosa)
- Yellow star thistle (centaurea solstitialis)

There are no additional noxious weeds declared within the watershed.

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Wildlife Species of Greatest Conservation Need

The Utah Comprehensive Wildlife Conservation Strategy (CWCS) prioritizes native animal species according to conservation need. At-risk and declining species in need of conservation were identified by examining species biology and life history, populations, distribution, and threats. The following table lists species of greatest conservation concern in the county.

AT-RISK SPECIES				
	Common Name	**Group**	**Primary Habitat**	**Secondary Habitat**
FEDERALLY-LISTED				
Endangered:	California Condor (experimental)	Bird	Cliff	
	Black-footed Ferret (extirpated)	Mammal	Grassland	High Desert Scrub
	Bonytail Chub	Fish	Water - Lotic	
	Colorado Pikeminnow	Fish	Water - Lotic	
	Humpback Chub	Fish	Water - Lotic	
	Razorback Sucker	Fish	Water - Lotic	
	Southwestern Willow Flycatcher	Bird	Lowland Riparian	Mountain Riparian
Threatened:	Mexican Spotted Owl	Bird	Cliff	Lowland Riparian
	Bald Eagle (breeding)	Bird	Lowland Riparian	Agriculture
Candidate:	Gunnison Sage-grouse	Bird	Shrubsteppe	
	Yellow-billed Cuckoo	Bird	Lowland Riparian	Agriculture
Proposed:	(None)			
STATE SENSITIVE				
Conservation Agreement Species:	Northern Goshawk	Bird	Mixed Conifer	Aspen
	Bluehead Sucker	Fish	Water - Lotic	Mountain Riparian
	Roundtail Chub	Fish	Water - Lotic	
	Flannelmouth Sucker	Fish	Water - Lotic	
Species of Concern:	Allen's Big-eared Bat	Mammal	Lowland Riparian	Pinyon-Juniper
	American White Pelican	Bird	Water - Lentic	Wetland
	Big Free-tailed Bat	Mammal	Lowland Riparian	Cliff
	Burrowing Owl	Bird	High Desert Scrub	Grassland
	Cornsnake	Reptile	Lowland Riparian	Pinyon-Juniper
	Eureka Mountainsnail	Mollusk	Mountain Shrub	Rock
	Ferruginous Hawk	Bird	Pinyon-Juniper	Shrubsteppe
	Fringed Myotis	Mammal	Northern Oak	Pinyon-Juniper
	Greater Sage-grouse	Bird	Shrubsteppe	
	Gunnison's Prairie-dog	Mammal	Grassland	High Desert Scrub
	Kit Fox	Mammal	High Desert Scrub	
	Lewis's Woodpecker	Bird	Ponderosa Pine	Lowland Riparian
	Smooth Greensnake	Reptile	Mountain Riparian	Wet Meadow
	Spotted Bat	Mammal	Low Desert Scrub	Cliff
	Three-toed Woodpecker	Bird	Sub-Alpine Conifer	Lodgepole Pine
	Townsend's Big-eared Bat	Mammal	Pinyon-Juniper	Mountain Shrub
	White-tailed Prairie-dog	Mammal	Grassland	High Desert Scrub

*Definitions of habitat categories can be found in the Utah Comprehensive Wildlife Conservation Strategy.

Comprehensive Wildlife Conservation Strategy (CWCS)

The Utah CWCS prioritizes habitat categories based on several criteria important to the species of greatest conservation need. The top ten hey habitats state-wide are (in order of priority):

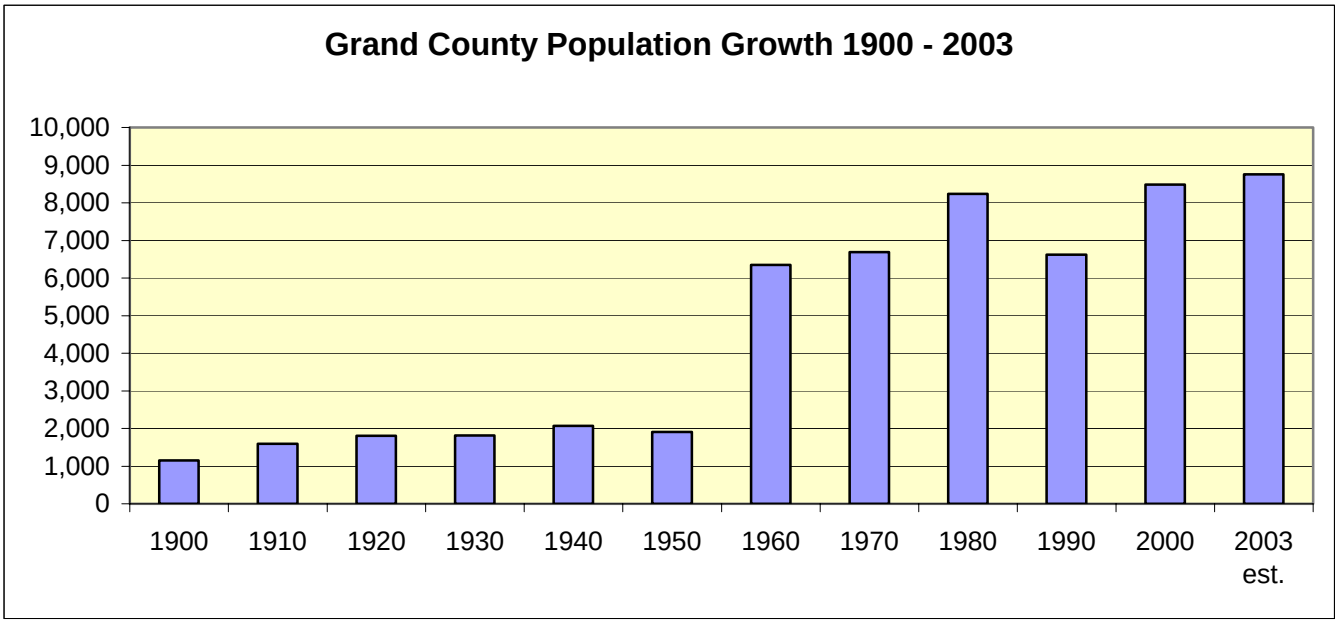
1) **Lowland Riparian** (riparian areas <5,500 ft elevation; principal vegetation: Fremont cottonwood and willow)
2) **Wetland** (marsh <5,500 ft elevation; principal vegetation: cattail, bulrush, and sedge)
3) **Mountain Riparian** (riparian areas >5,500 ft elevation; principal vegetation: narrow leaf cottonwood, willow, alder, birch and dogwood)
4) **Shrub steppe** (shrubland at 2,500 - 11,500 ft elevation; principal vegetation: sagebrush and perennial grasses)

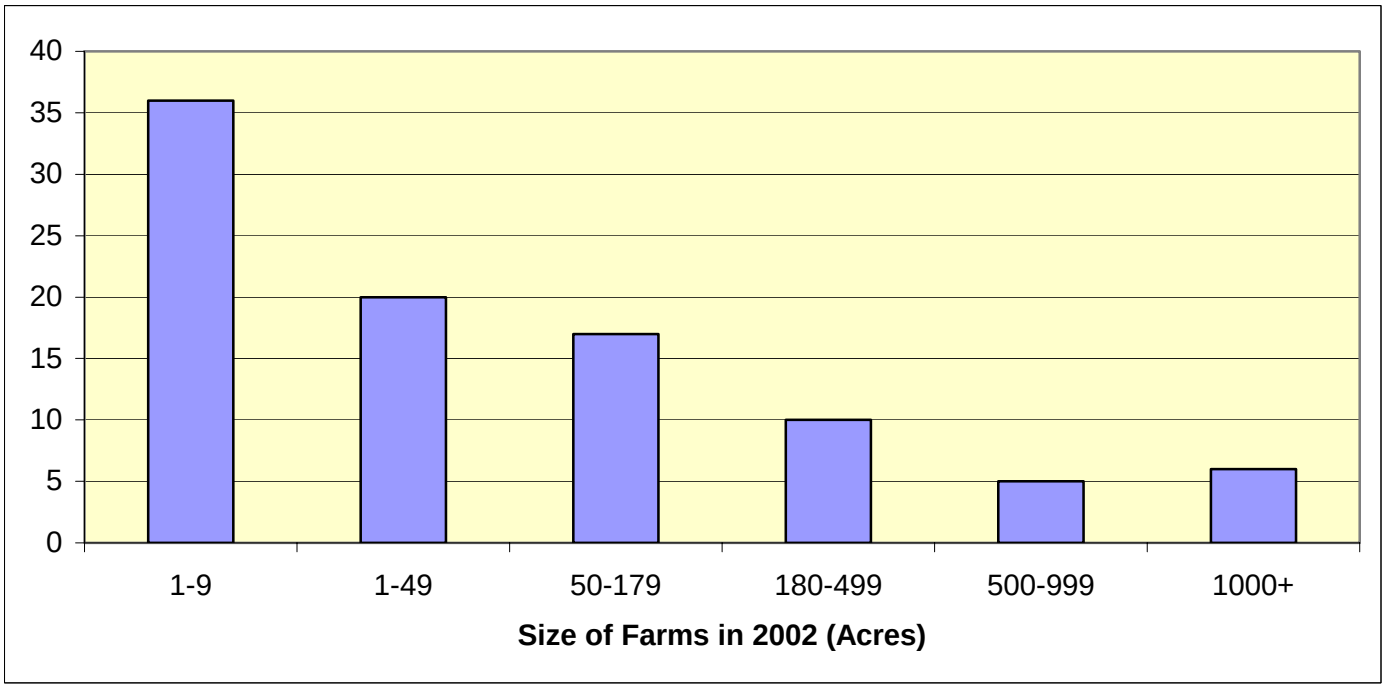
5) **Mountain Shrub** (deciduous shrubland at 3,300 - 9,800 ft elevation; principal vegetation: mountain mahogany, cliff rose, bitterbrush, serviceberry, etc.)
6) **Water - Lotic** (open water; streams and rivers)
7) **Wet Meadow** (water saturated meadows at 3,300 - 9,800 ft elevation; principal vegetation: sedges, rushes, grasses and forbs)
8) **Grassland** (perennial and annual grasslands or herbaceous dry meadows at 2,200 - 9,000 ft elevation)
9) **Water - Lentic** (open water; lakes and reservoirs)
10) **Aspen** (deciduous aspen forest at 5,600 - 10,500 ft elevation)

Resource Concerns – SOCIAL AND ECONOMIC

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Social and Economic	Non-Traditional Landowners and Tenants															
	Urban Encroachment on Agricultural Land	x	x	x				x								
	Marketing of Resource Products	x														
	Innovation Needs	x														
	Non-Traditional Land Uses															
	Population Demographics, Changes and Trends											x				
	Special Considerations for Land Mangement (High State and Federal Percentage)															
	Active Resource Groups (CRMs, etc)															
	Full Time vs Part Time Agricultural Communities											x				
	Size of Operating Units															
	Land Removed from Production through Easments											x				
	Land Removed from Production through USDA Programs															
Other																

Census and Social Data





Number of Farms: 103

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Public Survey/Questionnaire Results:

- Adequate water supply

- Adequate Livestock Grazing
- Oil and Gas Resources – availability/exploration
- Invasive species
- Quality and Quantity of groundwater
- Adequate marketing of ag... products
- Soil loss/erosion
- T&E wildlife species
- Native plant species
- Urban impact in rural areas

Footnotes / Bibliography

1. General information about Grand County obtained from the official Grand County website: http://www.grandcountyutah.net/

2. Location and land ownership maps made using GIS shape files from the Automated Geographical Reference Center (AGRC), a Utah State Division of Information Technology. Website: http://agrc.utah.gov/

3. Land Use/Land Cover layer developed by the Utah Department of Water Resources. A polygon coverage containing water-related land-use for all 2003 agricultural areas of the state of Utah. Compiled from initial USGS 7.5 minute Digital Raster Graphic water bodies, individual farming fields and associated areas are digitized from Digital Orthophotos, then surveyed for their land use, crop type, irrigation method, and associated attributes.

4. Prime and Unique farmlands derived from SURGO Soils Survey UT607 and Soil Data Viewer. Definitions of Prime and Unique farmlands from U.S. Geological Survey, http://water.usgs.gov/eap/env_guide/farmland.html#HDR5

5. Land Capability Classes derived from SURGO Soils Survey UT607 and Soil Data Viewer.

6. Tons of Soil Loss by Water Erosion data gathered from National Resource Inventory (NRI) data. Estimates from the 1997 NRI Database (revised December 2000) replace all previous reports and estimates. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is due to changes in statistical estimation protocols, and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000. For more information: http://www.nrcs.usda.gov/technical/NRI/

7. Precipitation data was developed by using average monthly or annual precipitation from 1960 to 1990. Publication date: 1998. Data was downloaded from the Resource Data Gateway, http://dgateway-wb01.lighthouse.itc.nrcs.usda.gov/lighthouse

8. Irrigated Adjudicated Water Rights obtained from the Utah Division of Water Rights.

9. USGS USGS Real –Time Data for the Nation

10. Stream length data calculated using Arc Map and 100k stream data from AGRC and 303d waters from the Utah Department of Environmental Quality.

11. General information about Grand County obtained from a Grand County website and the NRCS office.

12. The 2003 noxious weed list was obtained from the State of Utah Department of Food and Agriculture. For more information contact Steve Burningham, 801-538-7181 or visit their website at http://ag.utah.gov/plantind/noxious_weeds.html

13. Wildlife information derived from the Utah Division of Wildlife Resources' Comprehensive Wildlife Conservation Strategy (CWCS) (http://wildlife.utah.gov/cwcs/) and from the Utah Conservation Data Center (http://dwrcdc.nr.utah.gov/ucdc/).

14. County population data from the U.S. Census Bureau, Utah Quick Facts, http://quickfacts.census.gov/qfd/states/49000.html

15. Farm information obtained from the National Agricultural Statistics Service, 2002 Census of Agriculture. http://www.nass.usda.gov/census/census02/volume1/index2.htm