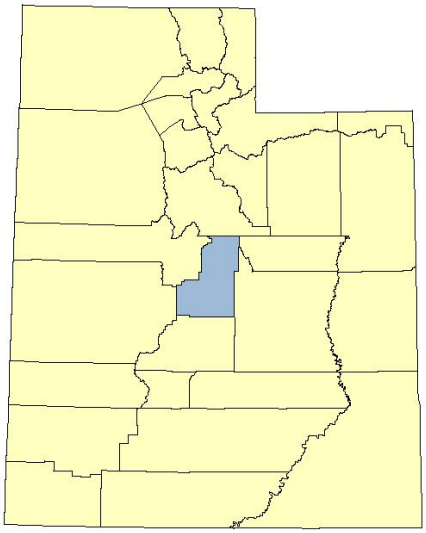
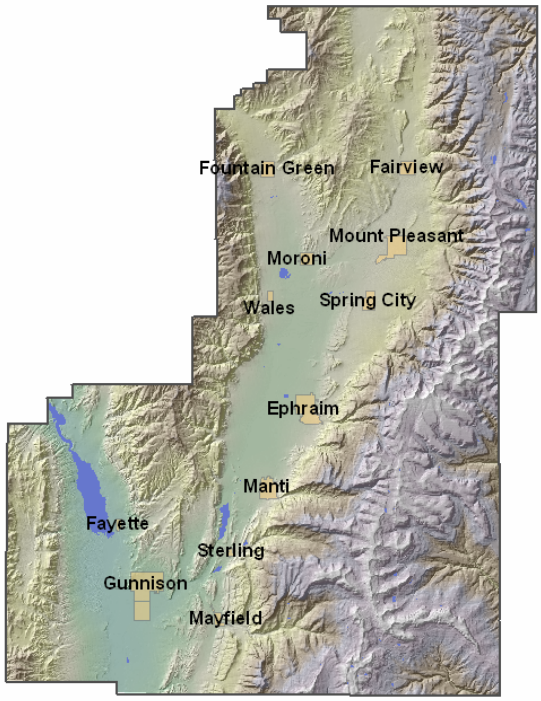
This resource assessment is designed to gather and display information specific to Sanpete County, Utah. This report will highlight the natural and social resources present in the county, detail specific concerns, and be used to aid in resource planning and target conservation assistance needs. This 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 the specific resource inventories.

Contents

Observations and Summary
Land Use
Resource Concerns - Soils
Resource Concerns - Water
Resource Concerns - Air, Plants, Animals
Resource Concerns - Social and Economic
Survey Results
Footnotes/Bibliography





Introduction

Sanpete County is located in, central Utah, about 90 miles south of Salt Lake City. The San Pitch River begins on the Wasatch Plateau north of Fairview and flows through the east branch of Sanpete Valley. The Sanpete valley floor has an area of about 240 square miles

The climate of Sanpete County is influenced by the large variations in topography. The elevation of the Sanpete valley floor ranges from 5,040 to 7,400 feet above sea level and the adjacent mountains rise to over 10,000 feet. The Sanpete Valley climate is semi-arid despite its high elevation. The average annual precipitation ranges from approximately 8 inches in the lower valley to more than 30 inches in the higher mountains. Most of the precipitation in Sanpete County falls as snow in the mountains, particularly the Wasatch Plateau, from November to April.

Equal Opportunity Providers and Employers.

The Principle upland native vegetation is Utah juniper, shadscale, big sagebrush, greasewood, Needlegrass, and other associated grasses, forbs and shrubs. Riparian species within the drainage include San Pitch cottonwood, coyote willow, peachleaf willow, saltgrass, sedges, foxtail, and wood rose.

Agriculture is a big part of Sanpete County. Livestock, Dairy, and poultry are the mainstays of Sanpete agriculture. Livestock is grazed on both private and public range land. The irrigated acreage is primarily devoted to raising feed for livestock. Vital to the economic well being of the Sanpete area is the production of turkeys for the national market. For many years Sanpete has ranked among the top 4 counties in the US based on total volume of turkey production. A typical year's output of Moroni Feed Company, an integrated farmer's cooperative which has been largely responsible for the rise of the turkey industry, is in excess of 80 million pounds of dressed turkey.

Parts of Sanpete County have specialty agriculturists. There is a small population that sells native seeds to industries. Sanpete County also exports a lot of hay to the west coast as well as to some foreign countries. There are also elk ranches, and numerous hunting clubs.

General Land Use Observations

Grass / Pasture / Hay Lands

- Complications related to overgrazing include poor pasture condition, soil compaction and water quality issues.
- Invasive weeds and annuals have decreased production and cover within county.
- Control of noxious and invasive plants is an ever increasing problem.
- Many soils have a high Total Dissolved Solid Concentration which leaches into surface and groundwater.

Range Land

- Improper livestock grazing, drought, and other practices have caused a decline in rangeland vegetation and cover.
- Invasive woody species such as Juniper, sagebrush, rabbit brush, and grease wood are suppressing areas better suited for grass, forbs, and shrub mikes.
- Residue, nutrient and pest management are needed to control erosion and to protect water quality.

Stream/ Riparian Areas

- Stream listed on Utah's 303(d) list for excess amounts of Total Dissolved Solids (TDS)
- High amounts of stream bank instability, and poor riparian vegetation.
- Landowner incentive to restore stream banks is low.

Forest

- On private, non-industrial forest there are issues with erosion, water quality and forest productivity
- On non-industrial forest land, landowner objectives often are not on actively managing the land for timber production.

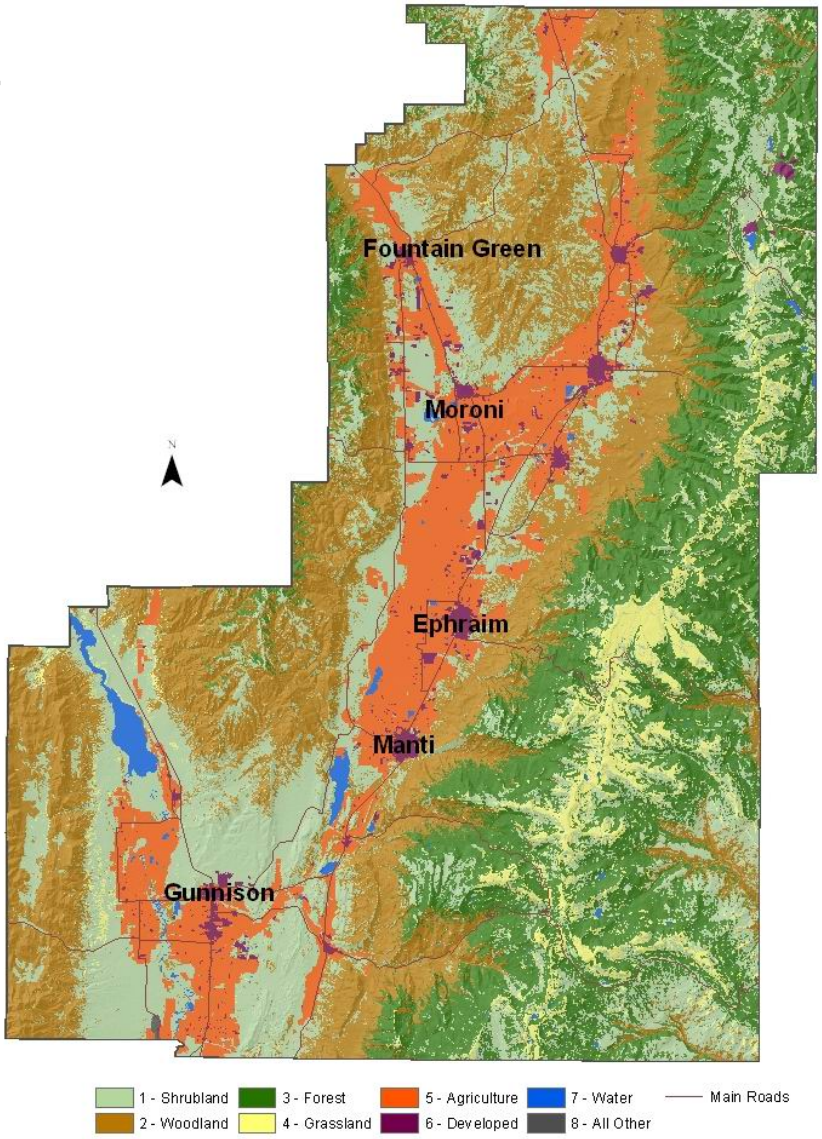
Back to Contents

Resource Assessment Summary

Categories	Concern high, medium, or low	Description and Specific Location (quantify where possible)
Soil	Medium	High ECe levels on soils adjacent to the San Pitch River and also on the foothills West of Manti and Ephraim cities.
Water Quantity	High	Adequate water supply for desired uses.
Water Quality Ground Water	High	Recharge zones and well head areas. Located through out county.
Water Quality Surface Water	High	AFO located throughout the county. Flood irrigated lands and spring runoff though wet bottom meadows entering the San Pitch River.
Air Quality	Medium	Dust from dirt roads through out the county. Dust from Poultry in North and Central Sanpete County. Agricultural odors throughout county from AFO's.
Plant Suitability	Medium	Loss of desirable species on rangeland and pastures throughout the county.
Plant Condition	Medium	Increased noxious or envasive species throughout county. Decreased productivity due to high ECe values near Ehphraim and Manti cities.
Fish and Wildlife	Medium	Spotted and Leatherside Chub species on sensitive species list located in North Sanpete County.
Domestic Animals	Medium	Need livestock water on pasture and range land. Bio-hazard concerns with outside sources migrating to beef and turkey farms.
Social and Economic	High	Sustain viable and profitable agricultural operations on small farms throughout the county (less than 150 acre farms).

Back to Contents

Land Use/Land Cover



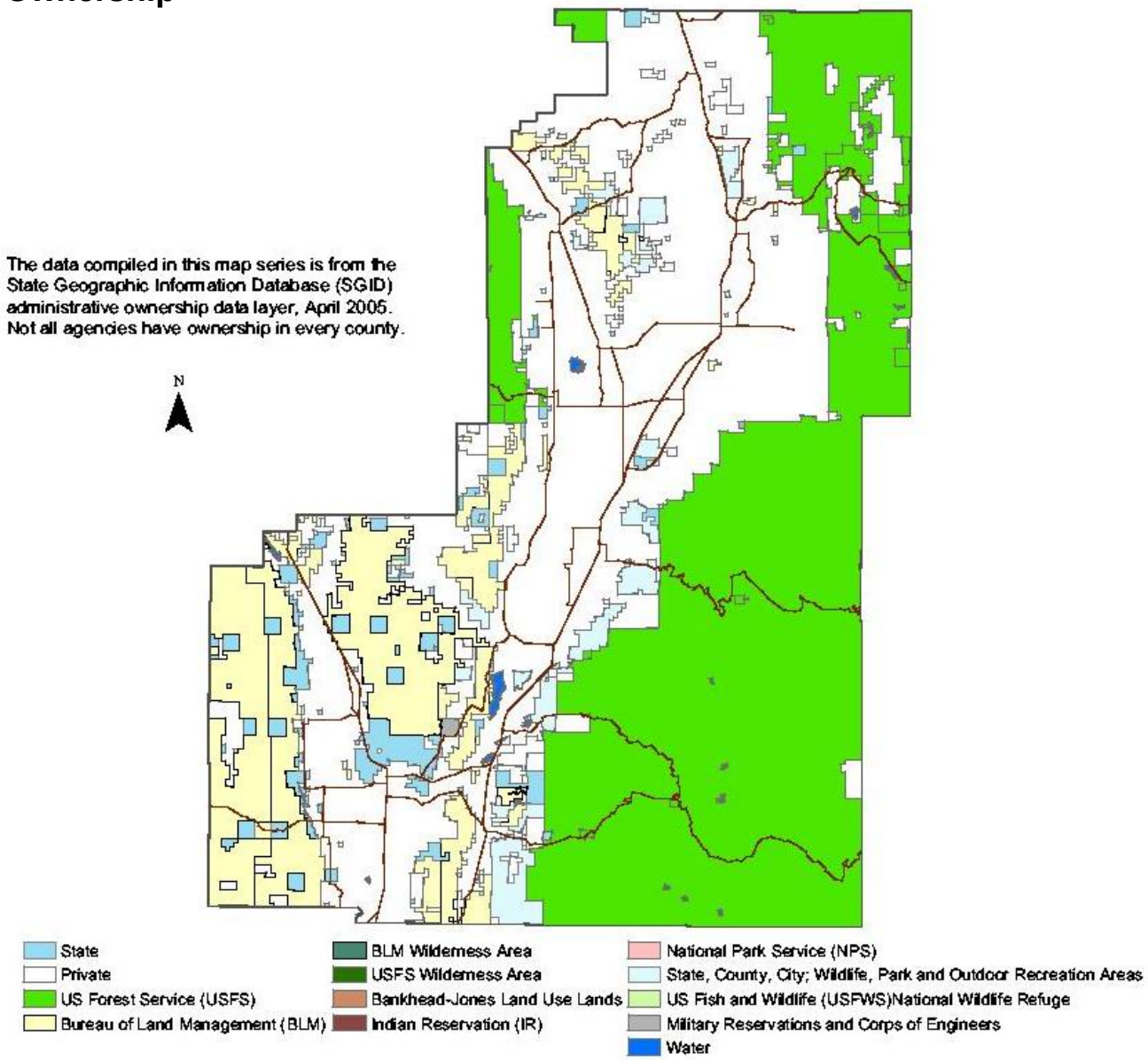
Land Cover/Land Use	Acres	%
Forest	390,889	36%
Grain Crops	57,000	5%
Conservation Reserve Program ***a**	0	0%
Grass/Pasture/Haylands	429,200	40%
Row Crops	25	0%
Shrub/Rangelands	180,700	17%
Water	2,500	0%
Wetlands	6,521	1%
Developed	12,700	1%
Sanpete County Totals *b	1,079,535	100%

***a**: *Estimate from Farm Service Agency records and include CRP/CREP.* ***b**: *Totals may not add due to rounding and small unknown acreages.*

Special Considerations for Sanpete County:

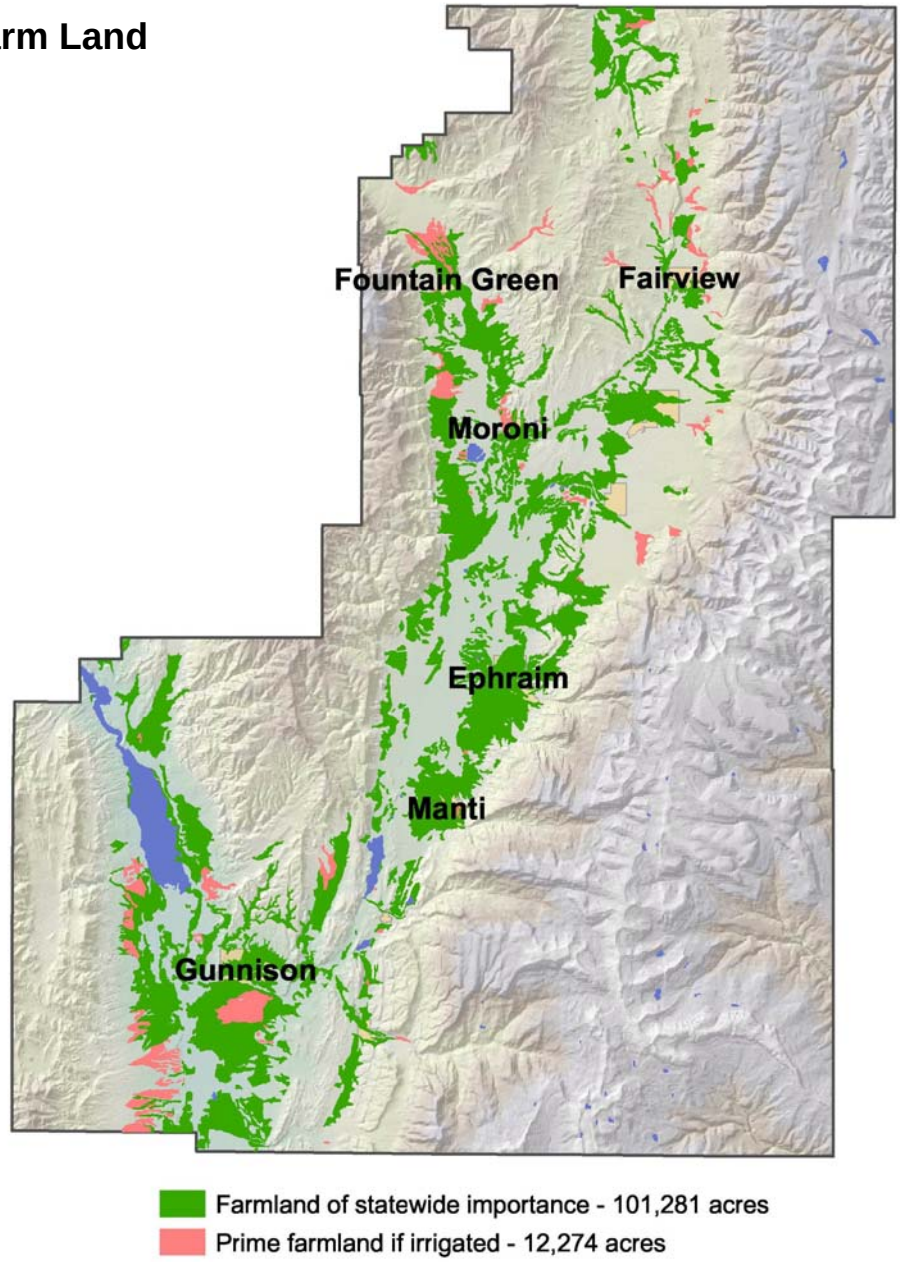
- 390,889.24 acres of land are owned by the Forest Service.
- 136,729.10 acres of land are owned by the BLM.
- 769.27 acres of land are owned by the Military
- 434,427.84 acres of land is private land.
- There are approximately 57,000 acres of grain.
- The state owns 59,788.41 acres.
- Sanpete County has many rural communities.

Land Ownership



Back to Contents

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.

Unique farmland

Land other than prime farmland that is used for the production of specific high-value food and fiber crops...such as, citrus, tree nuts, olives, cranberries, fruits, and vegetables

Additional farmland of statewide or local importance

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

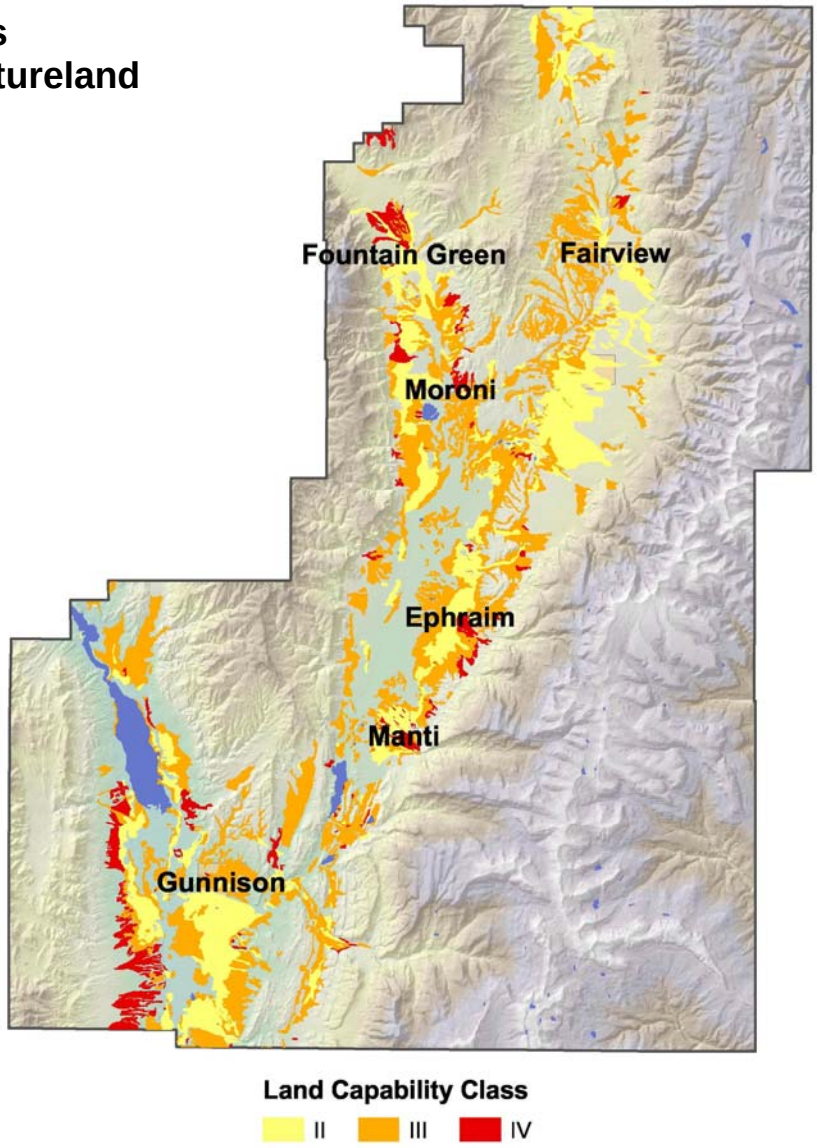
Back to Contents

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														
	Wind	x														
	Ephemeral Gully	x	x	x	x	x	x									
	Classic Gully			x	x		x									
	Streambank													x		
	Shoreline															
	Irrigation-induced	x	x	x												
	Mass Movement		x	x												
	Road, roadsides and Construction Sites										x					
Soil Condition	Organic Matter Depletion	x	x	x												
	Rangeland Site Stability			x	x	x										
	Compaction	x	x	x												
	Subsidence															
	ContaminantsSalts and Other Chemicals															
	Contaminants: Animal Waste and Other OrganicsN													x		
	Contaminants: Animal Waste and Other OrganicsP	x	x	x												
	Contaminants: Animal Waste and Other OrganicsK															
	Contaminants : Commercial FertilizerN															
	Contaminants : Commercial FertilizerP	x	x	x												
	Contaminants : Commercial FertilizerK															
	ContaminantsResidual Pesticides													x		
	Damage from Sediment Deposition													x		

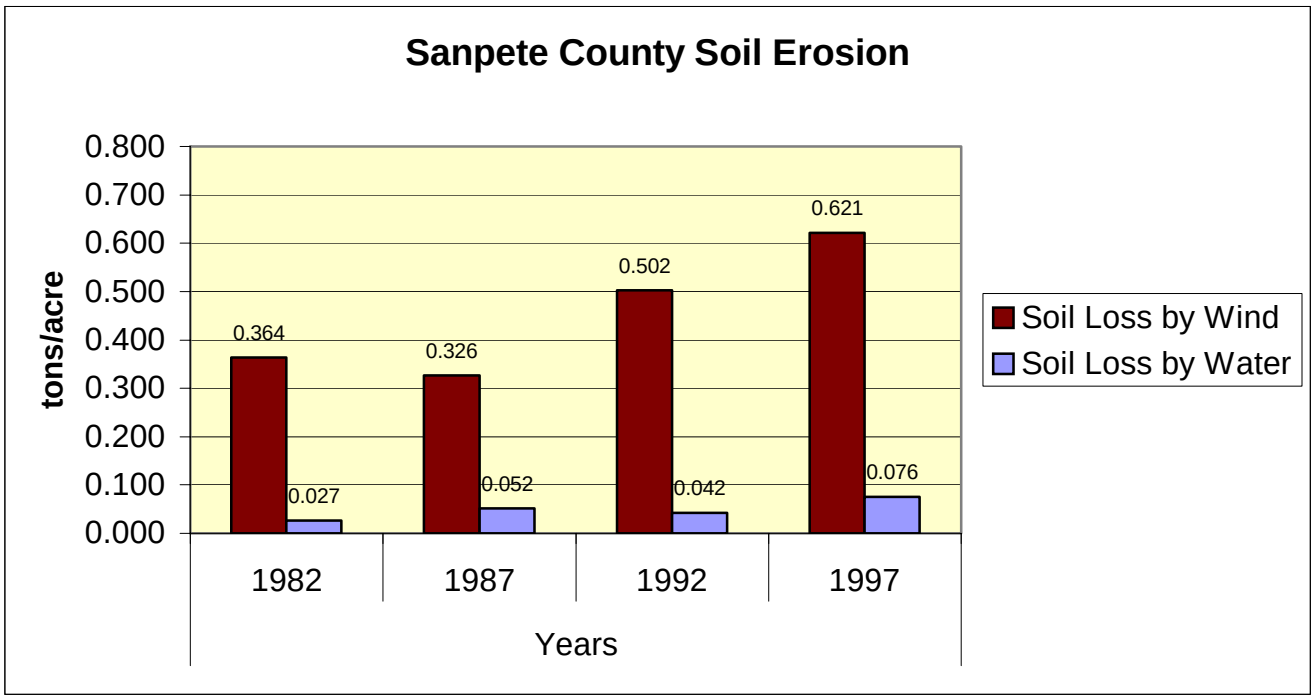
Back to Contents

Land Capability Class on Cropland and Pastureland



		Acres	Percentage
Land Capability Class (Irrigated Cropland & Pastureland Only)	**I** - slight limitations	0	0%
	II - moderate limitations	51,793	36%
	III - severe limitations	80,425	56%
	IV - very severe limitations	12,385	9%
	V - no erosion hazard, but other limitations	0	0%
	VI - severe limitations, unsuited for cultivation, limited to pasture, range, forest	0	0%
	VII - very severe limitations, unsuited for cultivation, limited to grazing, forest, wildlife	0	0%
	VIII - misc areas have limitations, limited to recreation, wildlife, and water supply	0	0%

Soil Erosion



- Sheet and rill erosion by water on the croplands and pasturelands have increased by approximately 0.05 tons/acre of soil from 1982 to 1997.
- Sheet and rill erosion by wind on the croplands and pasturelands have increased by approximately 0.3 tons/acre of soil erosion 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.

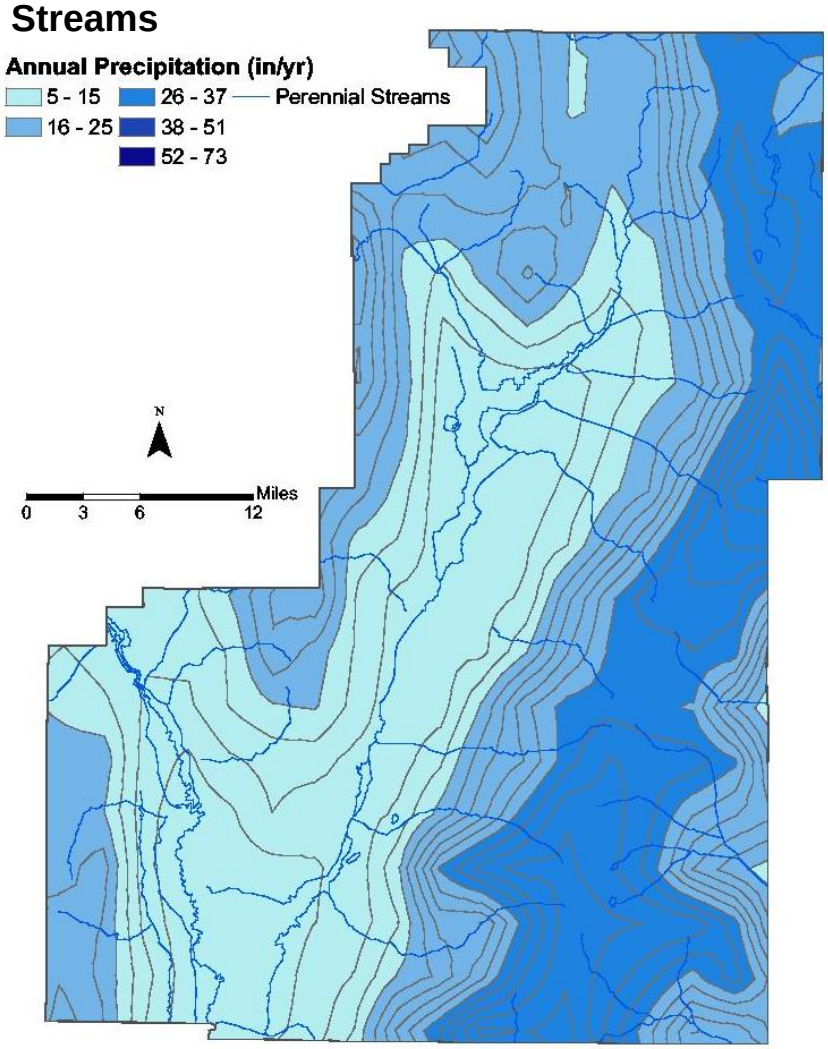
Back to Contents

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				X											
	Excessive Seepage															
	Excessive Runoff, Flooding, or Ponding	X	X	X												
	Excessive Subsurface Water	X	X	X												
	Drifted Snow															
	Inadequate Outlets															
	Inefficient Water Use on Irrigated Land	X	X	X												
	Inefficient Water Use on Non-irrigated Land															
	Reduced Capacity of Conveyances by Sediment Deposition								X					X		X
	Reduced Storage of Water Bodies by Sediment Accumulation	X	X	X	X	X			X							
	Aquifer Overdraft	X	X	X										X		
	Insufficient Flows in Watercourses													X		
Water Quality, Groundwater	Harmful Levels of Pesticides in Groundwater													X		
	Excessive Nutrients and Organics in Groundwater													X		
	Excessive Salinity in Groundwater													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		X	X	X									X		
	Excessive Suspended Sediment and Turbidity in Surface Water													X		
	Excessive Salinity in Surface Water	X	X	X	X		X							X		
	Water Quality – Colorado River Excessive Salinity															
	Harmful Levels of Heavy Metals in Surface Water															
	Harmful Temperatures of Surface Water													X		
	Harmful Levels of Pathogens in Surface Water															
	Harmful Levels of Petroleum in Surface Water															

Back to Contents

Precipitation and Streams



		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights	Surface	146680.00	319030.00
	Well		
	Total Irrigated Adjudicated Water Rights	146680.00	319030.00
Stream Flow Data	USGS 10217000 Sevier Riv. BLW San Pitch River NR Gunnison UT	Total Avg. Yield	
		May-Sept Yield	
		MILES	**PERCENT**
Stream Data	**Total Miles - Major (100K Hydro GIS Layer)**	342.32	n/a
	303d **(DEQ Water Quality Limited Streams)**	75.28	22%

***Well data not available. Surface water rights data taken from Irrigation Water management book published in 1976.**

	Irrigation Efficiency:	**<40%**	**40 - 60%**	**>60%**
Percentage of Total Acreage	Cropland	10%	30%	60%
	Pastureland	60%	30%	10%

Back to Contents

Watersheds & Total Maximum Daily Load (TMDL)

Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects		NRCS Watershed Plans, Studies & Assessments	
Name	Status	Name	Status
2005 (4) Irrigation water management 319 Plans	Setting up Contracts	San Pitch River Watershed	Draft for Review
2005 (3) Rangeland Management 319 Plans	Setting up Contracts		
2005 (1) Stream Restoration 319 Project	Completed		
2005 (1) Stream Restoration 319 Project	Setting up Contracts		
2004 (1) Stream Restoration 319 Project	Completed		
2004 (1) Corral Relocation 319 Project	Completed		
2004 (1) Rangeland Management 319 Project	70% Completed		
2004 (2) Pastureland Management 319 Project	50% Completed		
2004 (1) Irrigation Water Management Plan	Completed		
DEQ TMDL's		NRCS Comprehensive Nutrient Management Plans	
Name	Status	Number	Status
San Pitch River Watershed	EPA Approved - 1999	131	Planned 25 Implemented 14

Back to Contents

AFO/CAFO

Animal Feeding Operations (AFO)				
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Other
No. of Farms	8	41	47	27
No. of Animal Units	592	4414	13834	3311

Potential Confined Animal Feeding Operations (PCAFO)				
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Other
No. of Farms	6	6	2	2
No. of Animals Units	752	1565	436	280

Confined Animal Feeding Operations - Utah CAFO Permit				
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Other
No. of Permitted Farms	1	1	5	1
No. of Permitted Animal Units				

Back to Contents

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	X	X	X										X		
	Objectionable Odors										X	X				
	Reduced Visibility															
	Undesirable Air Movement															
	Adverse Air Temperature															
Plant Suitability	Plants not adapted or suited															
Plant Condition	Plant Condition – Productivity, Health and Vigor	X	X	X	X		X									
	Threatened or Endangered Plant Species: Plant Species Listed or Proposed for Listing under the Endangered Species Act							X						X		
	Threatened or Endangered Plant Species: Declining Species, Species of Concern															
	Noxious and Invasive Plants	X	X	X	X	X	X			X		X			X	
	Forage Quality and Palatability	X	X	X	X	X										
	Plant Condition – Wildfire Hazard				X	X	X									
Fish and Wildlife	Inadequate Food				X	X		X								
	Inadequate Cover/Shelter							X								
	Inadequate Water				X	X		X								
	Inadequate Space							X								
	Habitat Fragmentation							X								
	Imbalance Among and Within Populations							X								
	Threatened and Endangered Species: Species Listed or Proposed for Listing under the Endangered Species Act							X								
Domestic Animals	Inadequate Quantities and Quality of Feed and Forage	X	X	X	X	X	X									
	Inadequate Shelter															
	Inadequate Stock Water			X	X	X										
	Stress and Mortality			X	X	X	X									

Back to Contents

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:

- Bermudagrass** (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)
- Johnsongrass (sorghum halepense)
- Leafy spurge (euphorbia esula)
- Medusahead (taeniatherum caput-medusae)
- Musk thistle (carduus mutans)
- Perennial pepperweed (lepidium latifolium)
- Perennial sorghum (sorghum halepense L & sorghum almum)
- Purple loosestrife (lythrum salicaria L.)
- Quackgrass (agropyron repens)
- Russian knapweed (centaurea repens)
- Scotch thistle (onopordum acanthium)
- Spotted knapweed (centaurea maculosa)
- Squarrose knapweed (centaurea squarrosa)
- Yellow starthistle (centaurea solstitialis)

Additional noxious weeds declared by Sanpete County (2003): Houndstongue, Black henbane, Velvet leaf

Back to Contents

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:	(None)			
Threatened:	Brown (Grizzly) Bear (extirpated)	Mammal	Mixed Conifer	Mountain Shrub
	Canada Lynx	Mammal	Sub-Alpine Conifer	Lodgepole Pine
	Utah Prairie-dog	Mammal	Grassland	Agriculture
	Bald Eagle	Bird	Lowland Riparian	Agriculture
Candidate:	Yellow-billed Cuckoo	Bird	Lowland Riparian	Agriculture
Proposed:	(None)			
STATE SENSITIVE				
Conservation Agreement Species:	Columbia Spotted Frog	Amphibian	Wetland	Wet Meadow
	Northern Goshawk	Bird	Mixed Conifer	Aspen
	Bonneville Cutthroat Trout	Fish	Water - Lotic	Mountain Riparian
Species of Concern:	Burrowing Owl	Bird	High Desert Scrub	Grassland
	Ferruginous Hawk	Bird	Pinyon-Juniper	Shrubsteppe
	Grasshopper Sparrow	Bird	Grassland	
	Greater Sage-grouse	Bird	Shrubsteppe	
	Kit Fox	Mammal	High Desert Scrub	
	Leatherside Chub	Fish	Water - Lotic	Mountain Riparian
	Lewis's Woodpecker	Bird	Ponderosa Pine	Lowland Riparian
	Ninemile Pyrg	Mollusk	Wetland	
	Southern Bonneville Pyrg	Mollusk	Wetland	
	Three-toed Woodpecker	Bird	Sub-Alpine Conifer	Lodgepole Pine
	Townsend's Big-eared Bat	Mammal	Pinyon-Juniper	Mountain Shrub
	Western Toad	Amphibian	Wetland	Mountain Riparian

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

The Utah CWCS also 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):

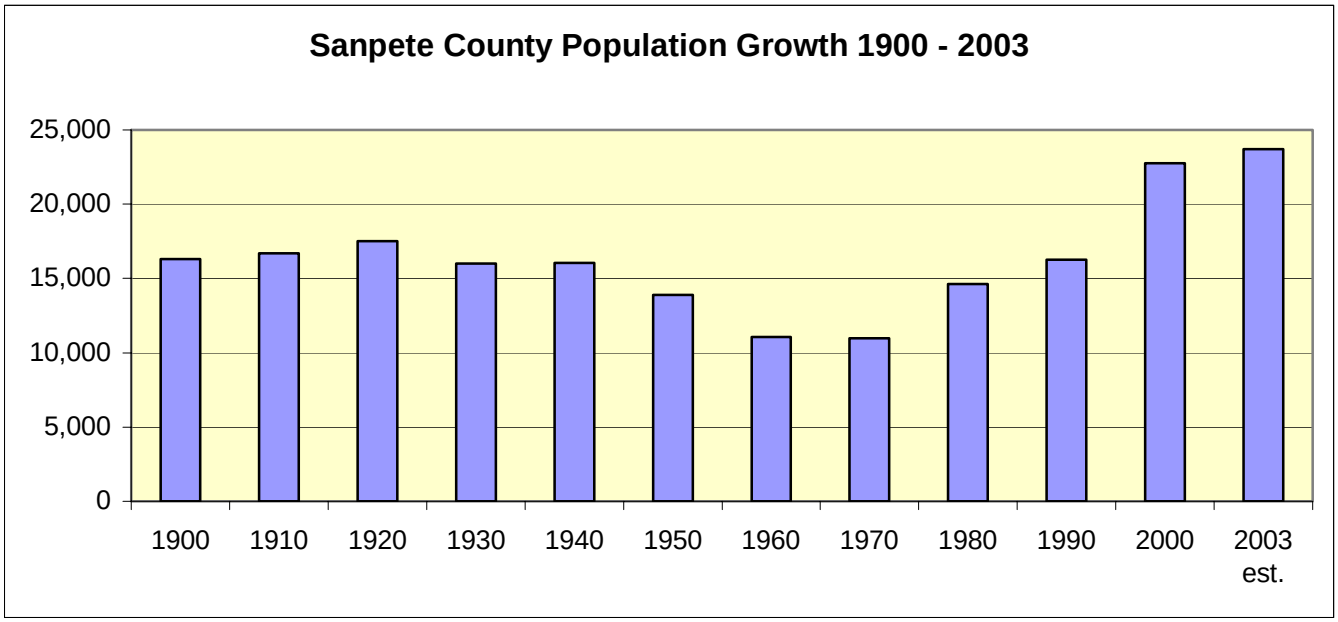
1) **Lowland Riparian** (riparian areas <5,500 ft elevation; principal vegetation: Fremont cottonwood and willow)
2) **Wetland** (marsh <5,500 ft elevation; principal vegetation: cattail, bulrush, and sedge)
3) **Mountain Riparian** (riparian areas >5,500 ft elevation; principal vegetation: narrowleaf cottonwood, willow, alder, birch and dogwood)
4) **Shrubsteppe** (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)

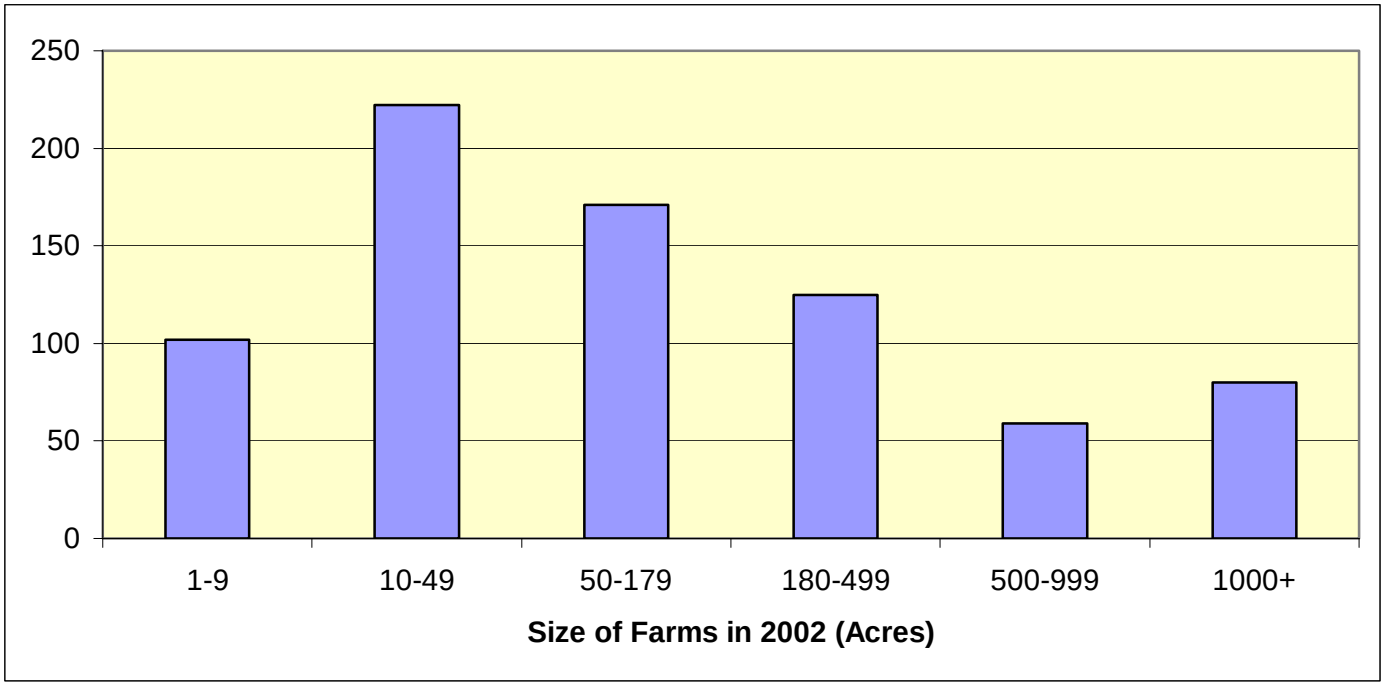
Back to Contents

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											x	x			
	Urban Encroachment on Agricultural Land	x	x	x	x	x	x	x								
	Marketing of Resource Products	x	x										x			
	Innovation Needs															
	Non-Traditional Land Uses			x	x								x			
	Population Demographics, Changes and Trends	x	x	x	x	x	x	x								
	Special Considerations for Land Mangement (High State and Federal Percentage)				x	x							x			
	Active Resource Groups (CRMs, etc)	x	x	x	x	x	x									
	Full Time vs Part Time Agricultural Communities										x	x				
	Size of Operating Units	x	x	x	x	x	x				x	x				
	Land Removed from Production through Easments	x	x	x	x	x	x									
	Land Removed from Production through USDA Programs	x	x	x	x	x	x									
Other																

Census and Social Data





Number of Farms: 759

Number of Operators:

- Full-Time Operators: 399
- Part-Time Operators: 360

Public Survey/Questionnaire Results:

#4 Zone Natural Resources Conservation Concerns Survey Results
(including mailed surveys & surveys in public meetings & outreach efforts)

Date: May & June 2005
County/Soil Conservation District:SANPETE Co./SANPETE SCD

Total Number of Respondents: 37

SCORING:

3 = a concern that should be addressed immediately
2 = a concern that should be addressed in the future
1 = a minor concern
0 = not a concern

Topic of Concern	3	2	1	0
Soil loss or erosion on land or along stream channels	11	18	8	2
Soil condition due to compaction or other changes	1	22	11	4
Soil contamination due to salts, chemicals or other materials	10	17	9	2
Adequate water supply for desired uses	33	6	0	9
Available water is clean enough for desired uses	16	14	5	2
Ground water quality and quantity	25	11	2	1

Storm runoff or flooding	11	18	7	1
Air quality, including blowing dust, smells and other pollutants	5	21	11	1
Plant health, production and adequate quantities	9	18	11	0
Presence of invasive plants including noxious weeds	29	9	0	0
Wildfire hazard	13	16	8	1
Adequate food, water and cover available for livestock	16	16	6	0
Adequate food, water and cover available for wildlife	5	17	14	2
Wildlife species of special concern including threatened & endangered	3	8	22	5
Loss of open space or agricultural lands	21	7	8	1
Urban/suburban growth	12	14	9	2
Adequate energy sources available	13	18	4	0
Recreation opportunities	3	16	18	1
Adequate support of historic/prehistoric resources	5	14	15	3
Adequate marketing for agricultural products	20	14	3	1

Remarks: Top 5 concerns (Immediate, Future, Minor)

Immediate

1- Adequate water supply for desired uses
2- Presence of invasive plants including noxious weeds
3- Ground water quality and quantity
4- Loss of open space or agricultural lands
5-Adequate marketing for agricultural products

Future

1-Wildlife species of special concern including threatened & endangered
2- Air quality, including blowing dust, smells and other pollutants
3-Soil loss or erosion on land or along stream channels
Storm runoff or flooding
Plant health, production and adequate quantities
Adequate energy sources available
4- Soil contamination due to salts, chemicals or other materials
Adequate food, water and cover available for wildlife
5-Wildfire hazard
Adequate food, water and cover available for livestock
Recreation opportunities

Minor

1- Wildlife species of special concern including threatened & endangered
2- Recreation opportunities
3- Adequate support of historic/prehistoric resources
4- Adequate food, water and cover available for wildlife
5- Soil condition due to compaction or other changes

Demographics

Gender:

# males	# females
27	10

Ethnicity/Race:

Hispanic	Native American	Asian	Caucasian
			35

African American	Other
1	1-America

Age:

18-24	25-38	39-50	51-65
		10	17

66+
10

Back to Contents

Footnotes / Bibliography

1. General information about Sanpete County obtained from a Sanpete County website and the NRCS office.

2. Location and land ownership maps made using GIS shapefiles 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 the Oregon Climate Service at Oregon State University 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. Irrigation Water Management Sevier River Basin, Utah. June 1976. United States Department of Agriculture.

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

11. Watershed information from. Draft San Pitch River Water Quality Management Plan.

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/).

13. Wildlife information provided by: Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). Last updated September 22, 2004.

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

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