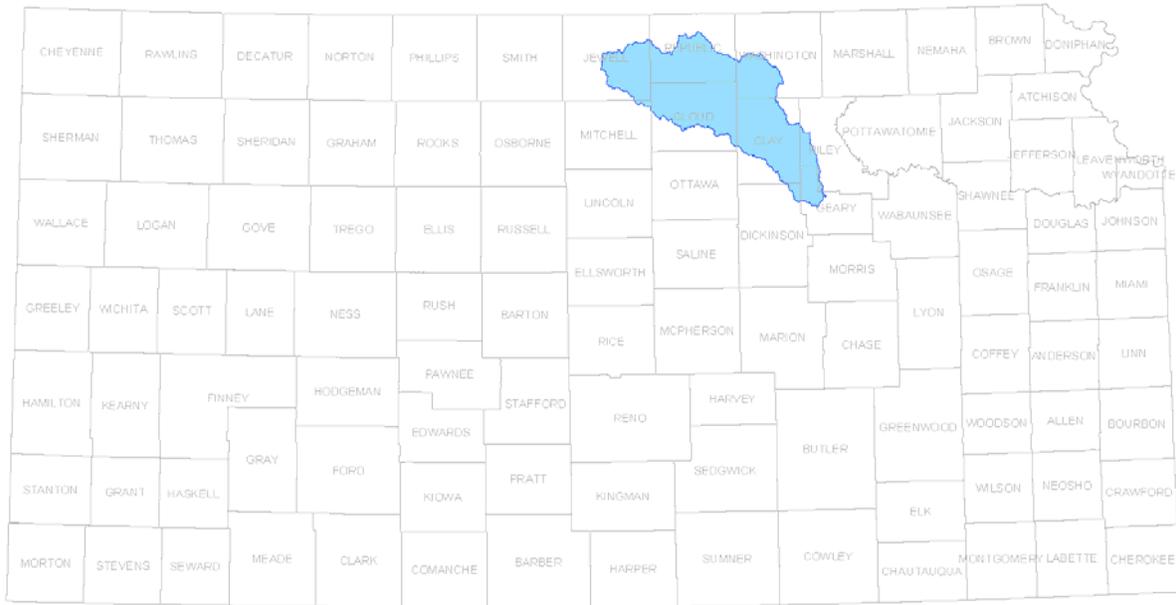


KANSAS

Rapid Watershed Assessment

Lower Republican Watershed Hydrologic Unit Code – 10250017



December 2006

Produced by:

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Natural Resources Conservation Service
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Salina, Kansas 67401**

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Resource Profile

1.0 Purpose

This rapid watershed assessment (RWA) organizes resource information into one document that local conservationists, units of government, and others can use to identify existing resource conditions and conservation opportunities. This will enable the user to direct technical and financial resources to the local needs in the watershed. This RWA provides a brief description of the Lower Republican sub-basins' natural resources, resource concerns, conservation needs, and ability to resolve natural resource issues and concerns.

2.0 Introduction

The Lower Republican 8-Digit Hydrologic Unit Code (HUC) sub-basin is comprised of 1,265,443 acres in north central Kansas and includes the counties of Jewell, Republic, Washington, Mitchell, Cloud, Clay, Riley, Dickinson, and Geary. According to the National Land Cover Data (NLCD), approximately 50 percent of the sub-basin is in grain and row crop; 42 percent is in grassland, pasture, and hay; and the rest is made up of other various land uses. This sub-basin is located in the Lower Republican watershed basin and drains into Milford Reservoir as it flows from northwest to southeast.

Relief Map



Resource concerns are numerous in the sub-basin. They include, but are not limited to, soil erosion, soil condition, insufficient water quantity, deteriorated water quality, deteriorating plant conditions, inadequate fish and wildlife cover and food, and inadequate stock water. Economic issues such as the high capital costs of crop production/farm operation and unreliable profits may delay the acceptance and implementation of conservation on agricultural lands in the sub-basin.

There are approximately 580 farms and 570 operators in the Lower Republican sub-basin. The estimated farm size in 2002 was 707 acres, an increase from 566 acres in the 1987 estimate.

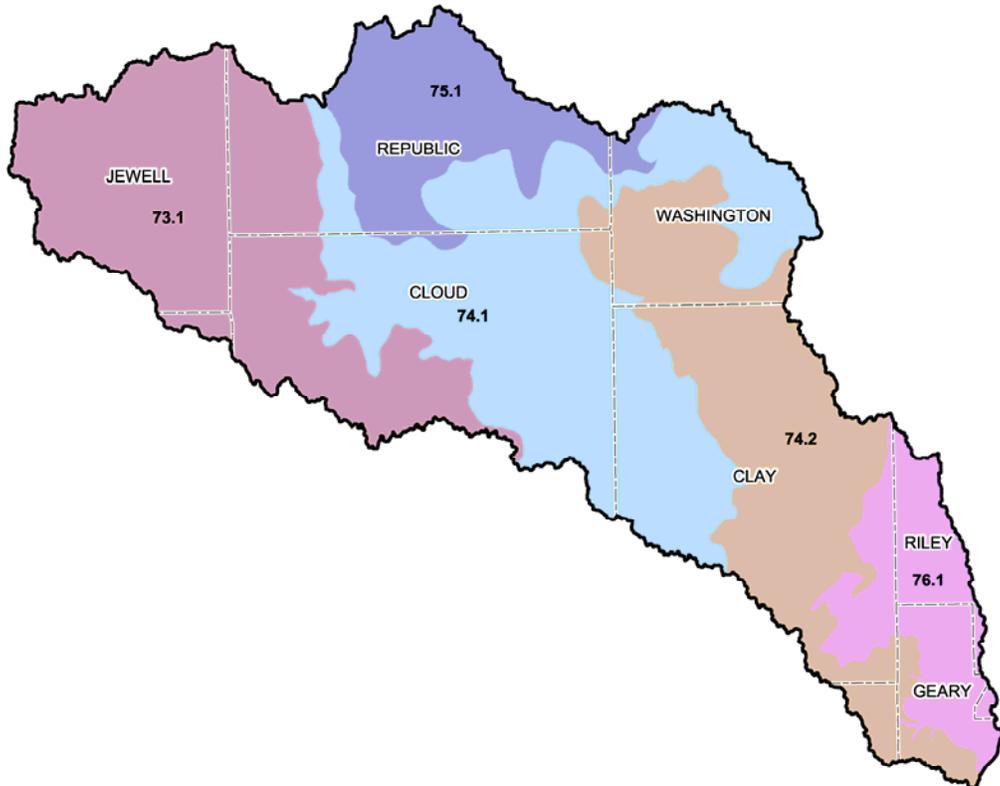
Nine Natural Resources Conservation Service (NRCS) service centers, nine county conservation districts, the Dry Creek Watershed District, and the Kansas Crossroads (forming) Resource Conservation and Development (RC&D) area provide conservation assistance in the sub-basin.

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3.0 Physical Description

The physical description of the Lower Republican sub-basin provides detailed information so that the user can better understand the natural resources associated with this geographical land unit.

3.1 Common Resource Area (CRA) Map¹



73.1 – Rolling Plains and Breaks: The Rolling Plains and Breaks CRA is dissected plains having broad undulating to rolling ridge-tops, loess mantled, and hilly to steep side-slopes. Local relief reaches 300 feet and is dissected with narrow drainage ways and river valleys. Soils are deep on the ridge-tops and moderately deep to shallow on the side-slopes. Pre-settlement vegetation was mid grass prairies. Most of this land is in farms, both small grain crops and native grasses.

74.1 – Central Kansas Sandstone Hills: The Central Kansas Sandstone Hills CRA is undulating to hilly plains interrupted by escarpments in which Cretaceous sandstone bedrock is regularly exposed. Local relief reaches 300 feet and is dissected with broad river valleys. Soils are shallow to moderately deep underlain by sandstone or shale bedrock. Pre-settlement vegetation was mid grass prairies. Most of this land is in farms, both native grasses and cropland.

74.2 – Central Kansas Alluvial Plain: The Central Kansas Alluvial Plains CRA is a level to nearly level plain mantled by loess and underlain by unconsolidated alluvial sediments. This CRA inter-fingers in the Central Kansas Sandstone Hills as broad river valleys and terraces with a local relief in the tens of feet. Pre-settlement vegetation was tall to mid grass prairies. Most of this land is in farms, dominantly small grains and hay.

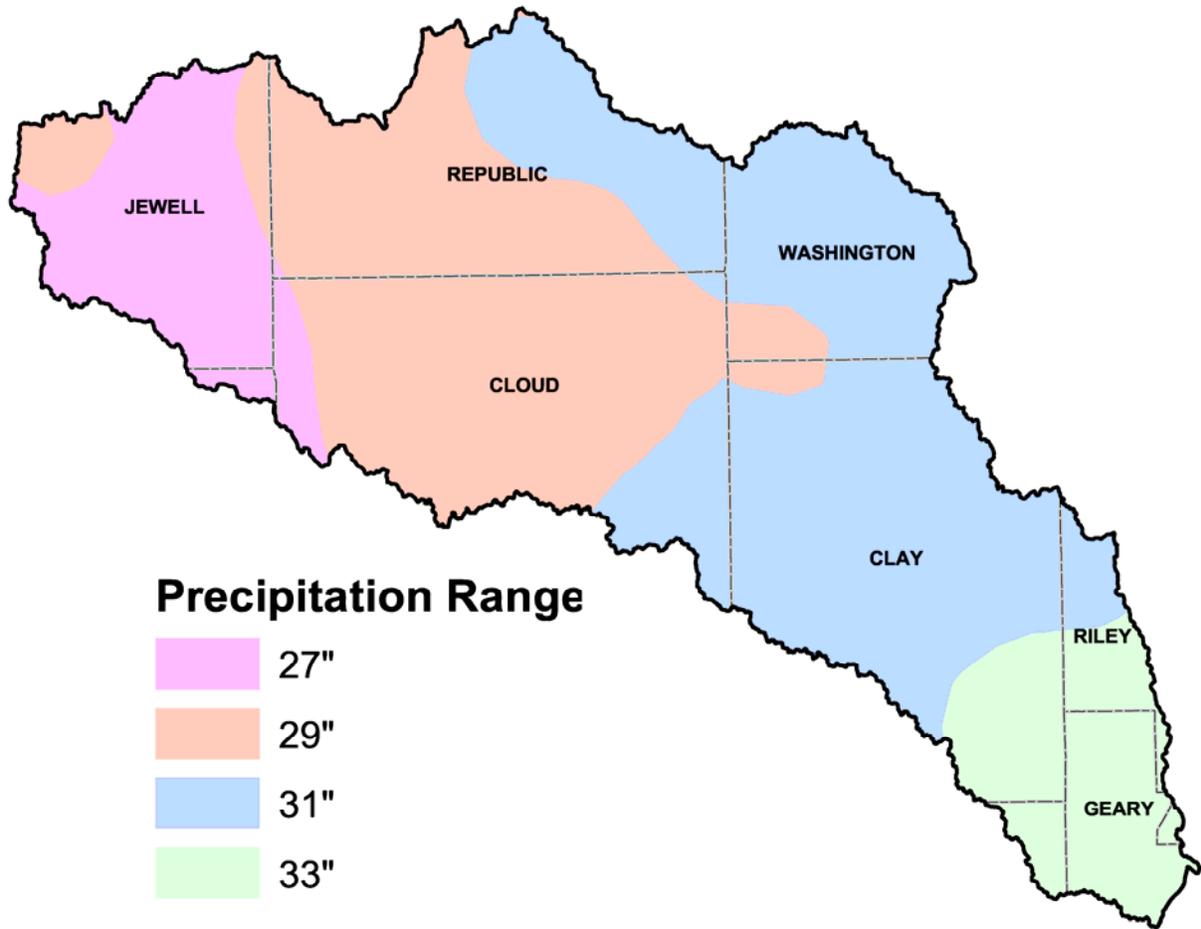
75.1 – Central Loess Plains: The Central Loess Plains CRA is a nearly level to gently rolling plains mantled by thick beds of loess. Local relief reaches 100 feet with narrow streams. Pre-settlement vegetation was tall to mid grass prairies. Most of this land is in farms, dominantly corn under irrigation from wells.

76.1 – Bluestem Hills: The Bluestem Hills CRA is a rolling plain interrupted by high, ragged escarpments in which limestone bedrock is regularly exposed. Local relief reaches 250 feet in the escarpment zones. Valley bottoms are narrow with steep sided slopes. Geologic parent materials are mainly thin-bedded Permian limestones and shales. Pre-settlement vegetation was tallgrass prairie. The land is in ranches.

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3.2 Precipitation Map²

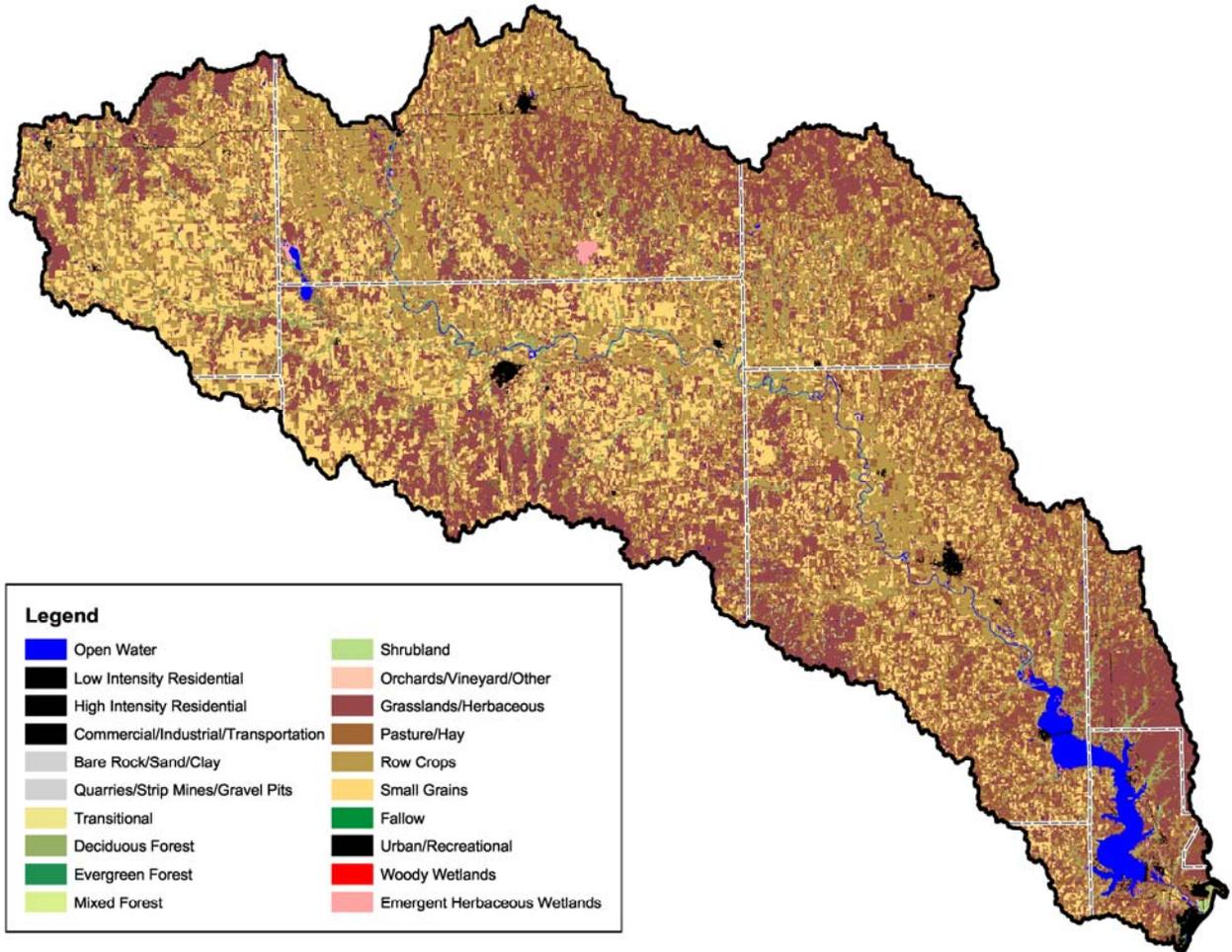
The map below depicts the average precipitation occurring within the sub-basin.



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3.3 Land Use and Land Cover Distribution Map⁴³

The map below represents the distribution of land cover and land use as defined by the NLCD.



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3.3.1 Land Use and Land Cover Summary Table³

Land Cover/Land Use	Ownership						Totals	%
	Public		Private		Tribal			
	Acres	%	Acres	%	Acres	%		
Open Water	16,020	1	9,787	1			25,807	2
Low Intensity Residential			3,872	*			3,872	0
High Intensity Residential			708	*			708	0
Commercial/Industrial/ Transportation			3,590	*			3,590	0
Bare Rock/Sand/Clay			104	*			104	0
Quarries/Strip Mines/Gravel Pits			92	*			92	0
Deciduous Forest	9,000	*	39,495	3			48,495	4
Evergreen Forest			1,133	*			1,133	0
Mixed Forest			29	*			29	0
Shrubland			2,323	*			2,323	0
Grasslands/Herbaceous	14,339	1	406,474	32			420,813	33
Pasture/Hay			116,048	9			116,048	9
Row Crops			344,532	27			344,532	27
Small Grains			291,732	23			291,732	23
Fallow			22	*			22	0
Urban/Recreational	1,084	*	1,197	*			2,281	0
Woody Wetlands			144	*			144	0
Emergent Herbaceous Wetlands	2,300	*	1,420	*			3,720	0
HUC Totals^a	42,743	3	1,222,702	97	0	0	1,265,443	100

*: Less than 1 percent of total acres.
^a: Totals are approximate due to rounding and small unknown acreages.

Special Considerations for This 8-Digit HUC:

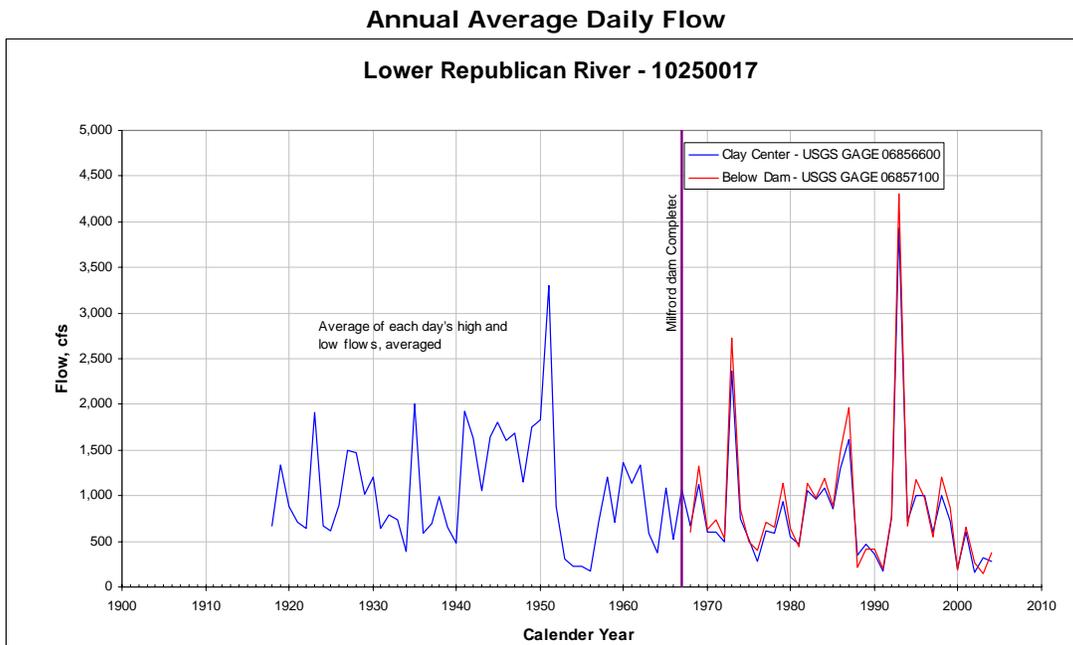
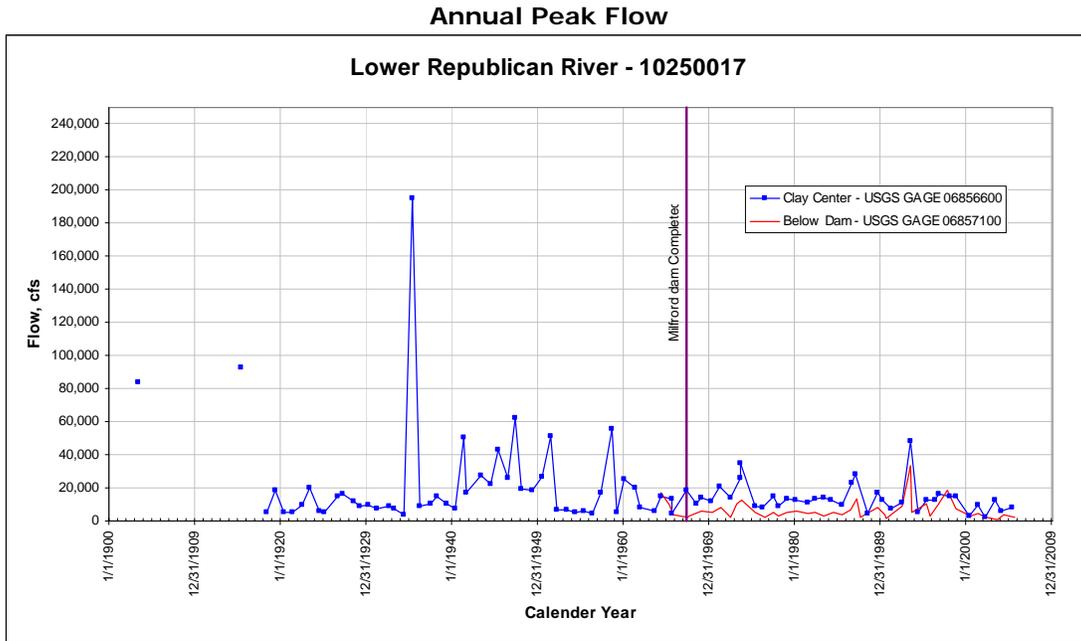
- Small grains and row crops are predominant commodities grown in rotation on approximately 50 percent of the HUC.
- Grasslands/Herbaceous and Pasture/Hay make up approximately 42 percent of the watershed.
- Forest makes up approximately 4 percent of the watershed.
- Urban land comprises less than 1 percent of the HUC.

Irrigated Lands ⁴	Percent of Cropland		Percent of HUC	
		< 10%		< 5%

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3.4 Stream Flow Data¹⁵

Stream flow data has been collected since 1900. There are three known U. S. Geological Survey (USGS) stream gage stations located within the sub-basin. For this assessment, data was collected from two stream gage stations on the Republican River: one near Clay Center, Kansas, and one below Milford Dam.



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3.5 Other Physical Descriptions

Stream Data ^{/5} <i>Total Miles of Streams in HUC</i>	Total Miles – Major (100K Hydro Geographic Information System [GIS] Layer)	746	
		ACRES	PERCENT
Land Cover/Use ^{/3} Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer	Open Water	22,013	14
	Low Intensity Residential	116	0
	High Intensity Residential	20	0
	Commercial/Industrial/Transportation	288	0
	Bare Rock/Sand/Clay	8	0
	Quarries/Strip Mines/Gravel Pits	9	0
	Deciduous Forest	20,708	13
	Evergreen Forest	604	0
	Mixed Forest	5	0
	Shrubland	337	0
	Grasslands/Herbaceous	43,313	27
	Pasture/Hay	20,258	13
	Row Crops	27,012	17
	Small Grains	21,577	14
	Fallow	2	0
	Urban/Recreational	100	0
	Woody Wetlands	26	0
Emergent Herbaceous Wetlands	1,214	1	
Total Acres of 100-foot Stream Buffers	157,611	100	
Land Capability Class ^{/4}	1 – slight limitations		
	2 – moderate limitations		
	3 – severe limitations	920,200	73
	4 – very severe limitations		
	5 – no erosion hazard, but other limitations		
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest		
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat		
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	227,400	18
	Total	1,147,600	91

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4.0 Resource Concerns

Resource concerns are issues related to the natural environment. Natural resources include soil, water, air, plants, animals, and humans (SWAPA +H). Local conservationists identified major resource issues by land use that affect the Lower Republican sub-basin.

4.1 Summary of Resource Concerns

Resource Concerns/Issues by Land Use								
SWAPA +H Concerns	Specific Resource Concern/Issue	Pasture/Hay	Grain Crops	Row Crops	Grazed Range	Forest	Wildlife	Urban
Soil Erosion	Sheet and Rill		X	X				
	Ephemeral Gully		X	X				
	Classic Gully				X			
Soil Condition	Organic Matter Depletion		X	X				
	Compaction		X	X				
	Contaminants: Commercial Fertilizer – Phosphorus		X	X				
Water Quality, Surface	Excessive Nutrients and Organics		X	X				
	Excessive Suspended Sediment and Turbidity		X	X				
Plant Condition	Productivity, Health and Vigor	X			X			
	Noxious and Invasive Plants	X			X			
	Forage Quality and Palatability	X			X			
Animal: Fish and Wildlife	Inadequate Food						X	
	Inadequate Cover/Shelter						X	
	Habitat Fragmentation						X	
Animal: Domestic	Inadequate Stock Water				X			
Human Economics	High Risk and Uncertainty		X	X				
	High Capital/Financial Costs		X	X	X			
	Low or Unreliable Profitability		X	X				

Pasture/Hay

- Pastureland is commonly over-utilized, lacks needed fertility, affected by timing of grazing, and is affected by invasive weeds.
- Hay land lacks needed fertility, affected by timing of haying and invasive weeds.
- Invasive/noxious plant species are present (e.g. *Serecia lespedeza*, Johnson Grass).

Grain and Row Crops

- Residue, nutrient, and pest management; vegetative and structural practices are necessary to control erosion, protect water quality, and improve soil conditions.
- For cropland, sheet and rill erosion is greater on steeper slopes.
- Over application of nutrients and organics has created surface water quality concerns.

Grazed Range

- Classic gullies are present where the grass resource has been over utilized.
- Rangeland is commonly over-utilized, affected by timing of grazing, invasive species persist, all of which affects forage quality and palatability.
- Invasive/noxious plant species are present (e.g. *Serecia lespedeza*).

Wildlife

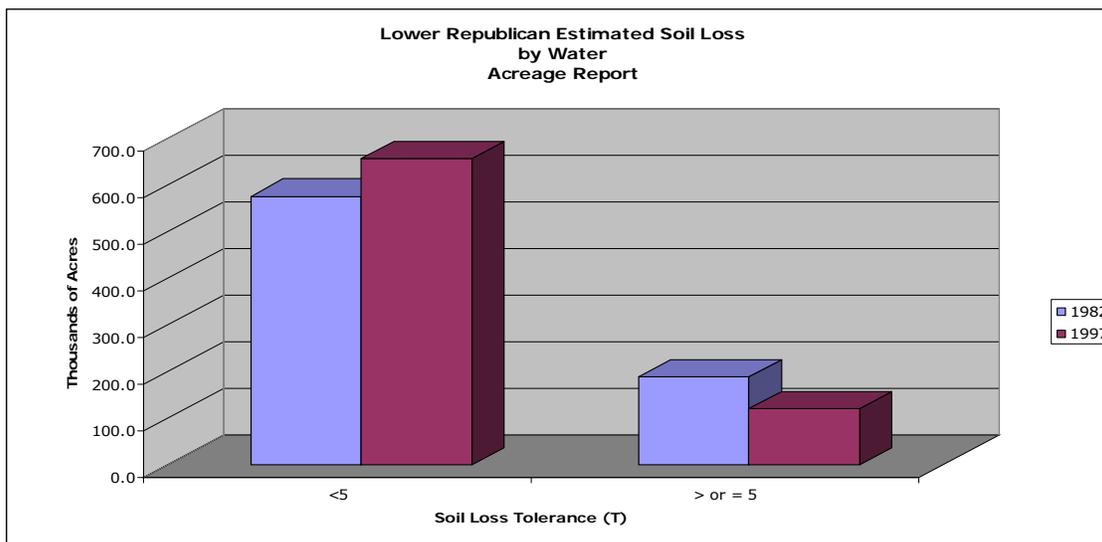
- In general, wildlife throughout the watershed lack available food abundance and distribution, available cover and shelter for brood rearing, and continuity of habitat.

General

- Inputs needed to manage large agricultural operations, costs of production, and low commodity values require large capital outlay and place financial burdens on landowners and producers.

4.2 Estimated Soil Loss^{/4}

Soil loss through wind and water erosion is critical to consider for dealing with air and water quality issues. As airborne particulate, soil particles are a major contributor to air quality concerns. Soil loss through water erosion causes water quality impairments, as pollutants are attached to soil colloids and are transported into the stream systems. Erosion by water was identified as a concern.



- From 1982 to 1997, the National Resources Inventory (NRI) estimates indicate a reduction of approximately 70,000 acres of soils eroding over 5 tons on agricultural lands has occurred. In 1997 there were 120,000 acres eroding above the sustainable level of 5 tons per acre per year by water erosion. This reflects slightly more than 15 percent of agricultural land may need erosion treatment.
- Controlling erosion not only sustains the long-term productivity of the land, but it also affects the amount of soil, pesticides, fertilizer, and other substances that move into the nation’s waters.
- Through NRCS programs, many farmers and ranchers have applied conservation practices to reduce the effects of erosion by water. More may need to be done.

4.3 Water Quality Conditions^{/13}

The Kansas Department of Health and Environment (KDHE) is responsible for monitoring water quality conditions in the state of Kansas. This section has been provided by KDHE.

For up-to-date water quality condition information, visit the KHDE web-site at: http://www.kdheks.gov/befs/download/KS2006_305b_Reoprts.pdf.

4.3.1 Confined Animal Feeding Operations

In Kansas, confined animal feeding operations (CAFOs) with an animal unit capacity of 300 or more must register with the KDHE. Waste disposal practices and the wastewater effluent quality of these registered CAFOs are closely monitored by the KDHE to determine the need for runoff control practices or structure in order to protect the waters of the state of Kansas. Because of this monitoring, registered CAFOs are not considered a significant threat to water resources within the watershed. A portion of the state's livestock population exists on small, unregistered farms. These small, unregistered livestock operations may contribute a significant source of fecal coliform bacteria and nutrients, depending on the presence and condition of waste management systems and proximity to water resources.

Confined Animal Feeding Operations Registry Table						
Animal/Operation Type	Dairy	Feedlot	Poultry	Swine	Truck-wash	Other
Number of Permitted Farms	12	102	1	51	0	1
Number of Permitted Animal Units	3,356	56,335	2,607	38,125	0	130

4.3.2 Public Water Supply Systems

In the State of Kansas, a public water supply system is defined by Kansas Statutes Annotated (K.S.A.) 65-162a and Kansas Administrative Regulations (K.A.R.) 28-15a-2 as a "system for delivery to the public of piped water for human consumption that has at least 10 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year." These systems are regulated by the state to assure the citizenry safe and pathogen-free drinking water. The KDHE oversees more than 1,086 statewide public water supply systems including municipalities, rural water districts, and privately owned systems. These systems may serve a small community of several families to a city of more than 300,000 persons.

There are 112 Active Public Water Supply Sites located within this watershed. Though water is drawn from surface water within the watershed, much of public water supply for the area is provided by two groundwater aquifers. A portion of the Dakota aquifer exists in the northwest section of the watershed and is often used for rural domestic water supply. Alluvial aquifers of the Republican River and its tributaries exist throughout the watershed and provide the primary water source for many public water supplies. Water quality in alluvial aquifers is generally good; however nitrates, minerals, pesticides, and bacteria can be pollutant concerns.

Source Water Assessment: The 1996 amendments to the Safe Drinking Water Act required each state to develop a Source Water Assessment Program (SWAP). Additionally, each state was required to develop a Source Water Assessment (SWA) for each public water supply that treats and distributes raw source water. In Kansas, there are approximately 763 public water supplies that required SWAs. A SWA includes the following: delineation of the source water assessment area; inventory of potential contaminant sources; and susceptibility analysis. The SWA must also be made available to the public. KDHE's Watershed Management Section has implemented the Kansas SWAP plan, and all SWAs are completed.

The Safe Drinking Water Act did not require protection planning to be part of the SWAP process. On a voluntary basis, KDHE encourages public water supplies and their surrounding communities to use the SWAs as the foundation for future protection planning efforts. Source water protection information will be posted on this site as it is compiled. To obtain a copy of SWAs in this watershed please visit: <http://www.kdheks.gov/nps/swap/SWreports.html>.

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4.3.3 Designated Uses

According to the Kansas Surface Water Register, the most *common* designated uses for streams and rivers in this watershed include: expected and special aquatic life use, primary and secondary contact recreation, and food procurement. The table below lists designated uses by stream and impairments in the watershed.

Designated Uses - Streams								
Stream Name	AL	CR	DS	FP	GR	IW	IR	LW
Beaver Cr	E	C, b		X				
Buffalo Cr, East	E	b						
Buffalo Cr, Middle	E	C		X				
Cheyenne Cr	E	b						
Coal Cr	E	b						
Dry Cr	E	b						
East Cr	E	b						
Elk Cr	E	C		X				
Elk Cr, W Fk	E	b		X				
Elm Cr	E	C		X				
Elm Cr, E Br	E	b						
Elm Cr, W Br	E	b						
Finney Cr	E	b						
Five Cr	E	b						
Fourmile Cr	E	C						
Hay Cr	E	b						
Huntress Cr	E	B						
Lincoln Cr	E	b						
Marsh Cr	E	a		X				
Marsh Cr, East	E	b		X				
Marsh Cr, West	E	b		X				
Mud Cr	E	b						
Mulberry Cr	E	b		X				
Oak Cr	E	b						
Otter Cr	E	C						
Parsons Cr	E	b						
Peats Cr	E	b						
Republican R	S	C	X	X	X	X	X	X
Riley Cr	E	b		X				
Rush Cr	E	b						
Salt Cr	E	C		X				
Salt Cr, West	E	b		X				
Spring Cr	E	b						
Timber Cr	E	C	X					
Turkey Cr	E	b						
Upton Cr	E	b						
Whites Cr	E	b		X				
Wolf Cr	E	C		X				
AL = Aquatic Life Support	GR = Groundwater Recharge		CR = Contact Recreation					
IW = Industrial Water Supply	DS = Domestic Water Supply		IR = Irrigation Water Supply					
FP = Food Procurement	LW = Livestock Water Supply							
E = Expected Aquatic Life Use Water								
B = Primary contact recreation stream segment is by law or written permission of the landowner open to and accessible by the public								
C = Primary contact recreation stream segment is not open to and accessible by the public under Kansas law								
a = Secondary contact recreation stream segment is by law or written permission of the landowner open and accessible by the public								
b = Secondary contact recreation stream segment is not open to and accessible by the public under Kansas law								
X = Referenced stream segment is assigned the indicated designated use								

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Designated Uses - Lakes								
Lake Name	AL	CR	DS	FP	GR	IW	IR	LW
Belleville City Lake	E	B		X				
Jamestown W.A.	E			X				
Milford Lake	E	A	X	X		X		
Milford W.A.	E			X				
Rimrock Park Lake	E	B	O	X		O	O	O

AL = Aquatic Life Support	GR = Groundwater Recharge	CR = Contact Recreation
IW = Industrial Water Supply	DS = Domestic Water Supply	IR = Irrigation Water Supply
FP = Food Procurement	LW = Livestock Water Supply	
E = Expected Aquatic Life Use Water		
A = Primary contact recreation stream segment is a designated public swimming area		
B = Primary contact recreation stream segment is by law or written permission of the landowner open to and accessible by the public		
X = Referenced stream segment is assigned the indicated designated use		

4.3.4 Total Maximum Daily Loads

Total Maximum Daily Load (TMDLs): Total Maximum Daily Loads (TMDLs) are limits on the amount of pollutant entering a stream or lake, while still attaining water quality standards. The water quality standards identify the designated uses of streams, lakes, and wetlands and the level of water quality necessary to fully support these uses. The process of developing TMDLs in Kansas determines:

1. The pollutants causing water quality impairments.
2. The magnitude of the impairment relative to applicable water quality standards.
3. The overall level of pollution reduction needed to attain achievement of water quality standards.
4. The allocation of pollutant loads to be distributed among point and non-point sources in the watershed affecting the water quality limited water body.
5. Suggested corrective actions and management practices to be implemented in order to achieve the load allocations, TMDLs, and water quality standards.
6. The monitoring and evaluation strategies needed to assess the impact of corrective actions in achieving TMDLs and water quality standards.
7. Provisions for future revision of TMDLs based on those evaluations.

The following table shows stream miles within HUC 8 10250017 that are listed on the 303d list. Section 303(d) of the Clean Water Act requires states to identify and list all water bodies where state water quality standards are not being met. Thereafter, TMDLs comprising quantitative objectives and strategies have been developed for these impaired waters within the watershed in order to achieve their water quality standards. For additional TMDL information or to download the TMDL report, visit <http://www.kdheks.gov/tmdl/index.htm>.

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Stream Data	Total Miles – Major (100K Hydro GIS Layer)	1,061
	303d/TMDL Listed Streams (DEQ)	829

2006 Impaired Waters with TMDLs			
Stream Segment	Stream/Watershed/Lake with TMDL	Priority for TMDL Implementation	Impairments
26,27,28	Republican River Watershed	Medium	Bacteria
8,9,13,17,18	Republican River Watershed	Medium	Bacteria
19,20,22,23	Salt Creek Watershed	High	Bacteria, Dissolved Oxygen
29,37	Buffalo Creek Watershed	Low	Bacteria, Chloride
	Lake Jewell	Medium	Eutrophication, Dissolved Oxygen, Aquatic Plants
	Belleville City Lake	Low	Eutrophication
	Jamestown Wildlife Management Area	Low	Eutrophication, pH
	Jamestown Wildlife Management Area	Low	Siltation
	Jamestown Wildlife Management Area	Low	Bacteria

2006 Impaired Waters Needing TMDLs	
Impaired Stream/Lake	Impairment
Milford Lake	Eutrophication
Peats Creek	Copper
Middle Republican River	pH
Lower Republican River	Biological
Mulberry Creek	Zinc

Impairment definitions:

Bacteria: Bacteria indicators (either fecal coliform or *E. coli*) are found in the digestive systems of warm-blooded animals. In surface waters, bacteria are an indicator of potential disease causing organisms. Potential sources of bacteria contamination in surface waters include municipal wastewater, livestock, septic systems, pets, and wildlife.

Dissolved Oxygen: Oxygen available to aquatic life with the water column. State water quality standards require a stream or lake to have at 5mg/L of dissolved oxygen.

Chloride: Chloride is a naturally occurring mineral found Kansas lakes, streams, and groundwater. In high concentrations, chloride can cause deterioration of domestic plumbing, water heaters, and municipal water works.

Eutrophication: Excessive nutrients entering lake causing an increase in algae to nuisance conditions, impairing aquatic life, recreation, and water supply uses.

Aquatic Plants: Excessive macrophytes (aquatic plants) impairing recreation uses of lakes.

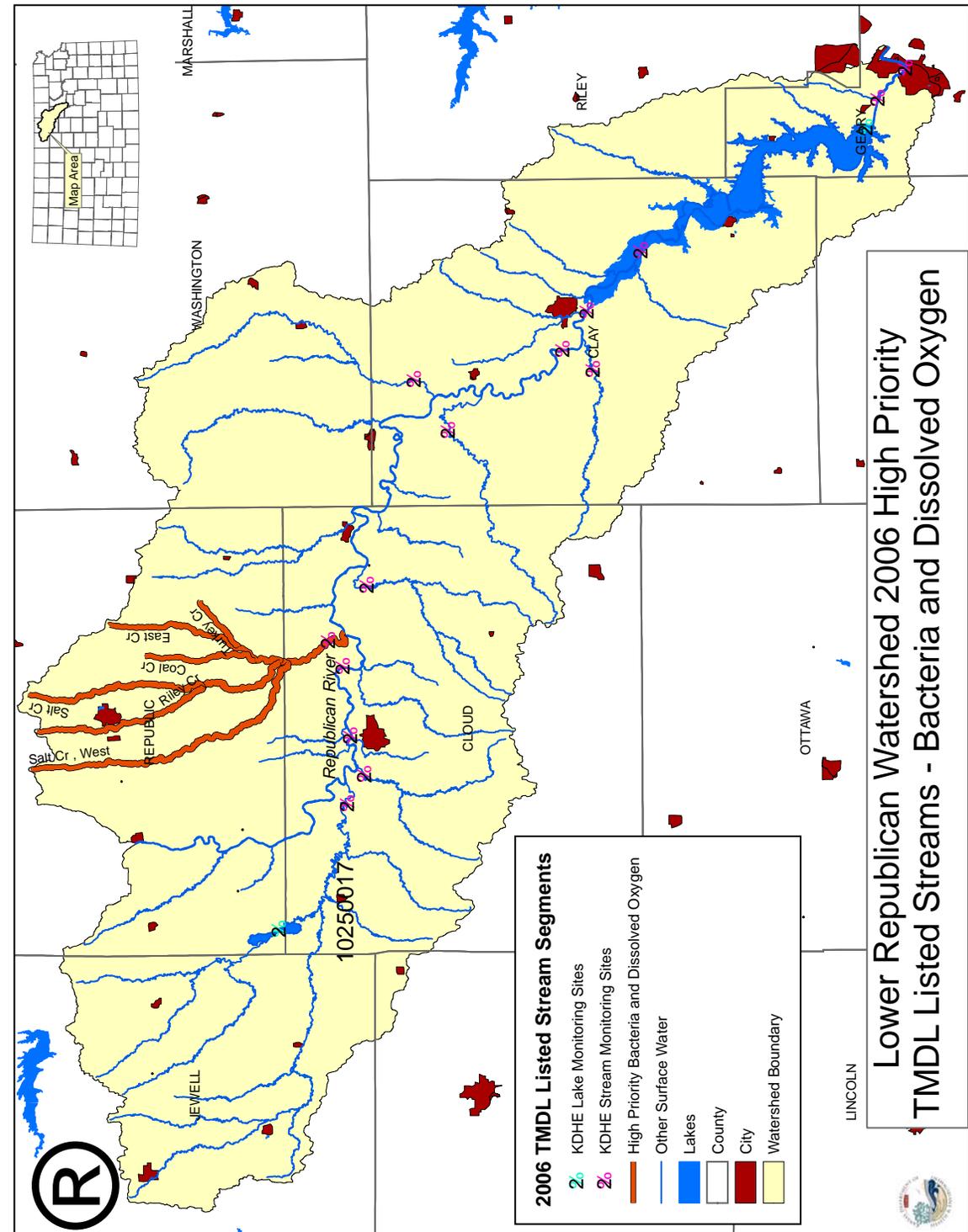
pH: Rises in alkalinity levels over pH 8.5 caused by excessive photosynthesis from algae.

Siltation: Excessive sediment entering lake causing loss of volume, increased turbidity, and decreased clarity. Siltation causes impairment of aquatic life, recreation, and water supply uses.

Copper, Zinc: Metals contained in sediments and runoff impairing aquatic life by toxic amounts in soft water.

Biological: Impairments caused by excessive nutrients/sediments, toxic ammonia or organic material present in the stream, decreasing the diversity of clean water biological organisms in the stream.

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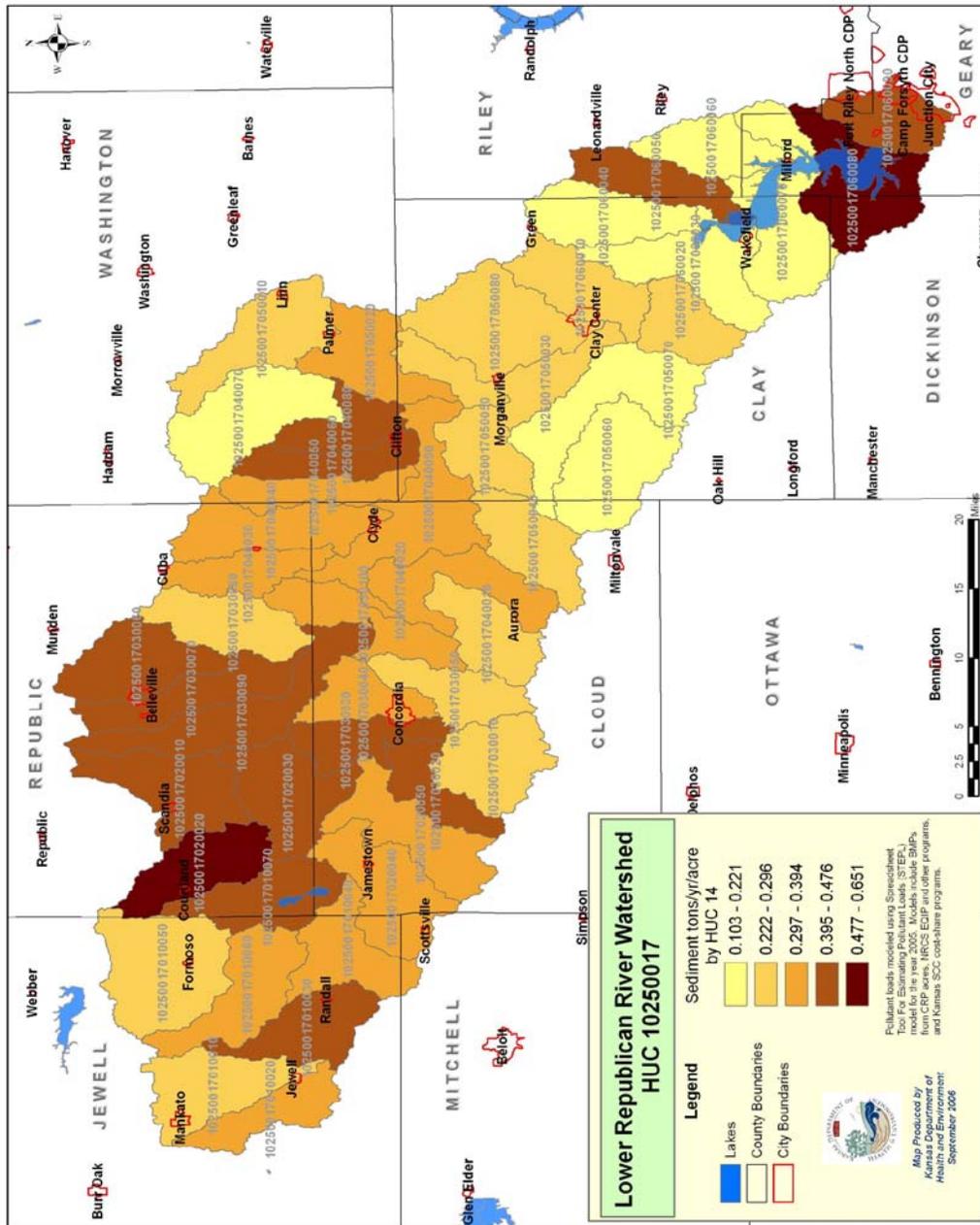


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4.3.5 Modeled Pollutant Loads

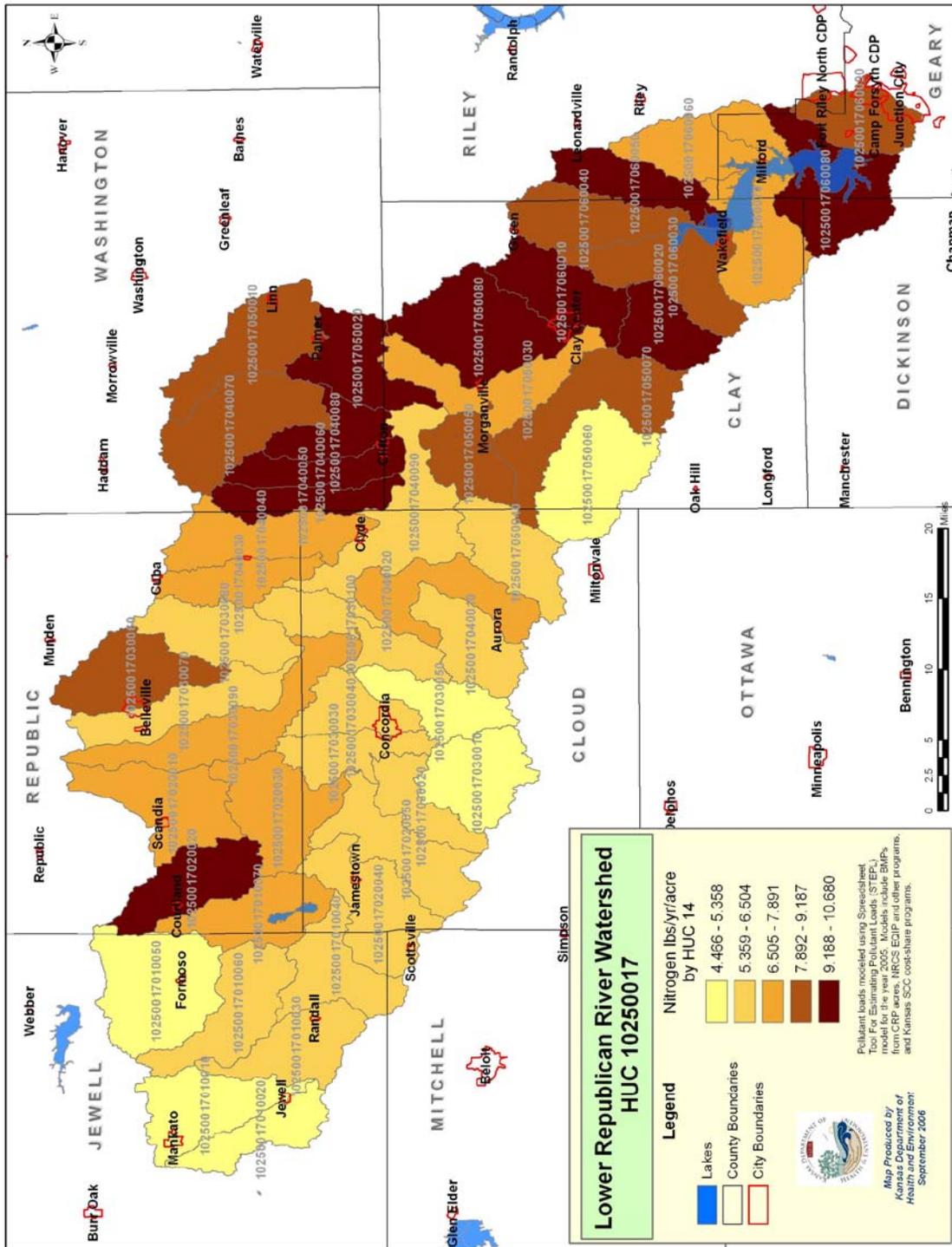
The following figures indicate pollutant loads (sediment, biological oxygen demand, nitrogen, and phosphorus) modeled using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) model for the year 2005. Models include best management practices for Conservation Reserve Program (CRP) acres, NRCS Environmental Quality Incentives Program (EQIP) and other program, and Kansas State Conservation Commission (SCC) cost-share programs.

Sediment



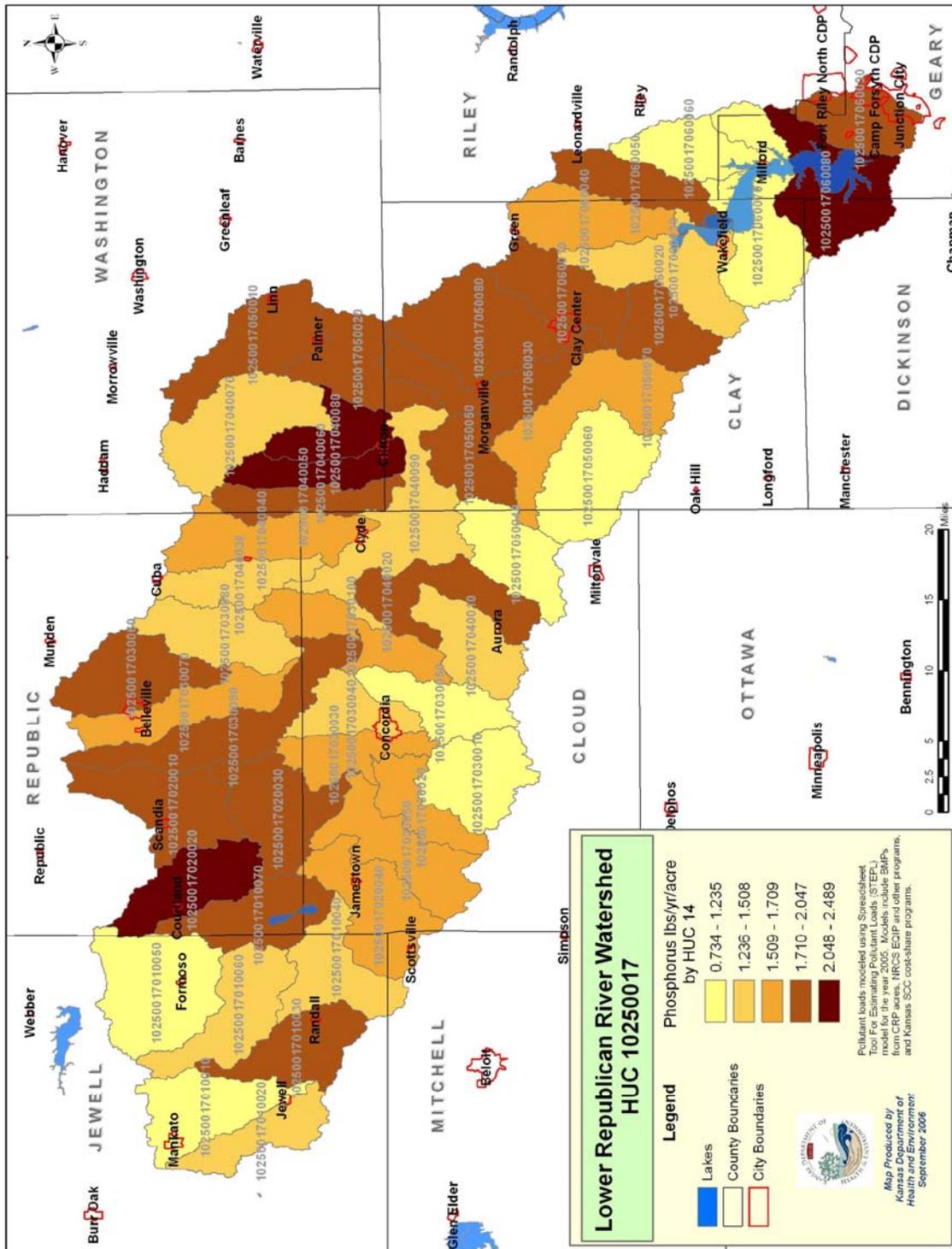
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Nitrogen



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Phosphorus



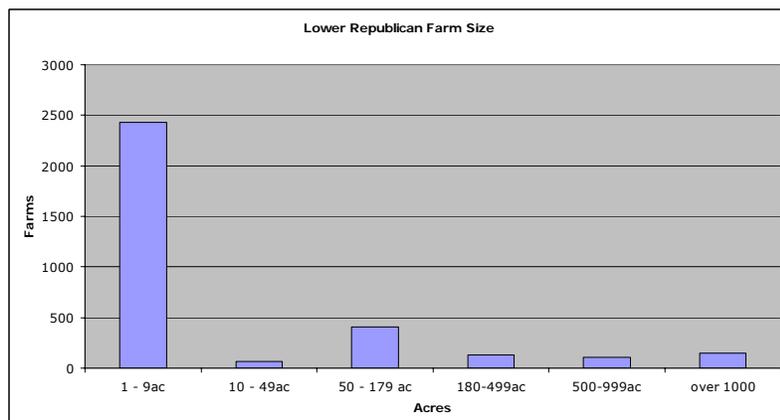
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4.4 Threatened and Endangered Species Status ¹⁷

The Endangered Species Act provides protection to animals that are experiencing a decline in population, or nearing extinction. The table below lists species of concern and their federal and state designation(s).

LISTED THREATENED AND ENDANGERED SPECIES¹²			
Species Common Name (Scientific name)	Threatened (T), Endangered (E), Proposed (P), Candidate (C)	Designated Critical Habitat (Y)es/(N)o	Listing: Federal (F), State (S)
Animals, Vertebrates - Fishes			
Silver Chub (<i>Macrhybopsis storeriana</i>)	E	Y	S
Sturgeon Chub (<i>Macrhybopsis gelida</i>)	C/T	Y	F/S
Topeka Shiner (<i>Notropis topeka</i>)	E/T	Y	F/S
Animals, Vertebrate - Birds			
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	T/T	Y	F/S
Eskimo Curlew (<i>Numenius borealis</i>)	E/E	N	F/S
Least Tern (<i>Sterna antillarum</i>)	E/E	Y	F/S
Peregrine Falcon (<i>Falco peregrinus</i>)	E	N	S
Piping Plover (<i>Charadrius melodus</i>)	T/T	Y	F/S
Snowy Plover (<i>Charadrius alexandrinus</i>)	T	N	S
Whooping Crane (<i>Grus Americana</i>)	E/E	N	F/S
Animals, Vertebrate – Mammals			
Eastern Spotted Skunk (<i>Spilogale putorius interrupta</i>)	T	N	S
Animals, Invertebrate - Insects			
American Burying Beetle (<i>Nicrophorus americanus</i>)	E/E	N	F/S

5.0 Census and Social Data (2000) ¹⁸



Number of Farms: 580
- Average Farm Size: **700**

Number of Operators:
- Full-Time Operators: **400**
- Part-Time Operators: **170**

5.1 Estimated Level of Willingness and Ability to Participate in Conservation ¹⁹

The Lower Republican Watershed exhibits a good likelihood of full participation in the first five years of practice application, with moderate adjustments in technical and financial assistance and conservation marketing; although management skills and a combination of educational assistance and technical assistance could be increased to improve the participation rate. On average, there are no concerns with the availability of technical assistance in the watershed. The existing information and education

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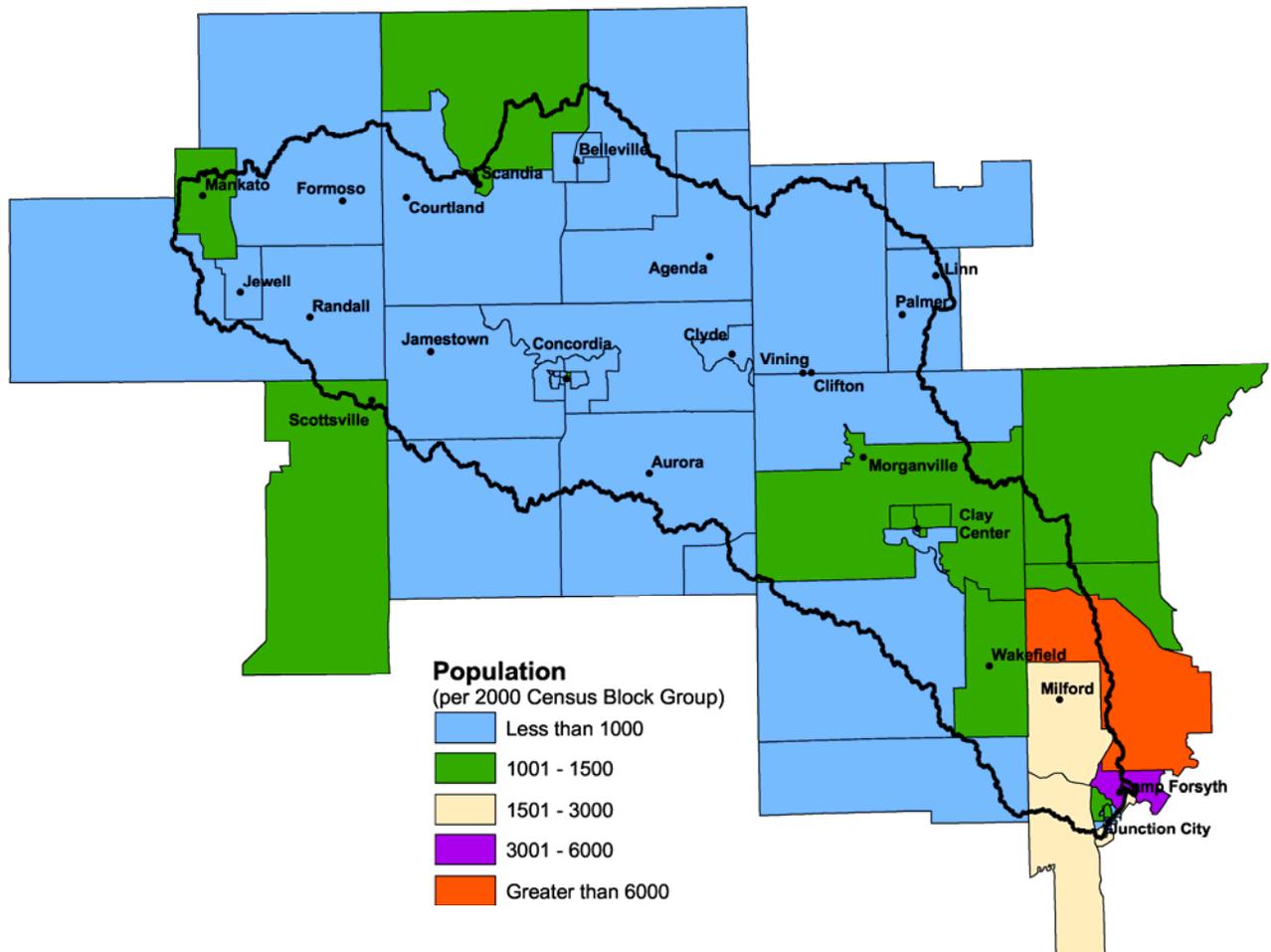
delivery system may need minor modifications to improve effectiveness. Existing financial incentives need major expansion or substantial increases to achieve successful participation rates in a reasonable amount of time.

5.2 Evaluation of Social Capital¹⁰

Social capital is defined as bonds of trust that arise between people interacting in everyday life. Local conservationists developed a summary of social capital for this sub-basin and concluded the following:

Collectively, communities in the Lower Republican sub-basin are reported to be effective at solving problems. Some small communities are very close knit and are willing to assist their neighbors by pooling their resources. Dry climatic conditions over the past decade have affected the community economic capital, which has led to a decreased state of social well-being, and thus less likely to address resource concerns.

5.3 Population Distribution Map (2000)



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6.0 Conservation Progress

Conservation on the land is defined by the progress made by local landowners and operators addressing resource issues. Progress is typically accomplished through private, local, state, and federal funds. This data is current through the date the RWA was published. For up-to-date NRCS Performance Results System (PRS) information, visit: <http://ias.sc.egov.usda.gov/prsreport2006/>.

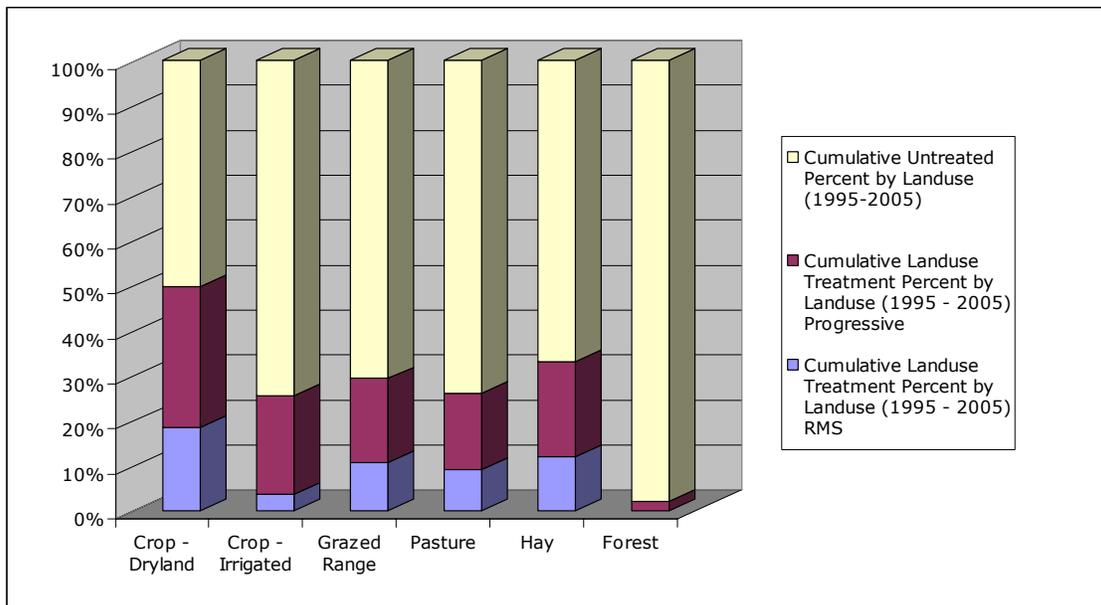
6.1 Reported Conservation Progress (2002 – 2006)

PRS Data	FY02	FY03	FY04	FY05	FY06	Avg/Year	Total
Total Conservation Systems Planned (ac)	38,024	33,735	N/A	35,518	37,319	36,149	144,596
Total Conservation Systems Applied (ac)	28,280	17,663	N/A	25,299	23,675	23,729	94,917
Conservation Treatment (Units/Acres)							
Brush Management (ac)			246	356	902	301	1,504
Comprehensive Nutrient Management Plan (no)	1	3			3	1	7
Conservation Crop Rotation (ac)			7,652	8,109	5,142	4,181	20,903
Contour Buffer Strips (ac)					36	7	36
Contour Farming (ac)			3,193	1,559	945	1,139	5,697
Cover Crop (ac)			1,062	1,102	759	585	2,923
Critical Area Planting (ac)			101	37	14	30	152
Diversion (ft)			6,232	926	4,279	2,287	11,437
Fence (ft)			383	8,154	11,051	3,918	19,588
Field Border (ft)					53,731	10,746	53,731
Filter Strip (ac)			54	16	97	33	167
Forage Harvest Management (ac)			291	307	58	131	656
Grassed Waterway (ac)			72	27	61	32	160
Irrigation System, Sprinkler (ac)			10	933	699	328	1,642
Irrigation Water Conveyance, Pipeline, High-Pressure, Underground, Plastic (ft)			7,286	9,132	10,572	5,398	26,990
Irrigation Water Conveyance, Pipeline, Low-Pressure, Underground, Plastic (ft)			3,411	7,986		2,279	11,397
Irrigation Water Management (ac)	34		134	669	921	352	1,758
Nutrient Management (ac)			5,220	4,072	4,901	2,839	14,193
Pest Management (ac)	5,801	8,204	6,185	6,024	6,950	6,633	33,164
Pipeline (ft)			5,534	1,465	10,374	3,475	17,373
Pond (no)			9	5	4	4	18
Prescribed Burning (ac)			294	2,745	1,708	949	4,747
Prescribed Grazing (ac)	2,611	1,333	1,403	802	2,613	1,752	8,762
Range Planting (ac)			551	458	334	269	1,343
Residue Management, Mulch Till (ac)			228	281	546	211	1,055
Residue Management, No-Till/Strip Till (ac)			8,079	5,785	5,538	3,880	19,402
Residue Management, Seasonal (ac)			2,412	638	522	714	3,572
Restoration and Management of Declining Habitats(ac)			352	1,251	403	401	2,006
Riparian Forest Buffer (ac)			5	21	9	7	35
Streambank and Shoreline Protection (Feet)				2,740		548	2,740
Terrace (ft)			140,282	163,251	88,776	78,462	392,309
Tree/Shrub Establishment (ac)	3	3		7	1	3	14
Underground Outlet (ft)			5,906	1,494	260	1,532	7,660
Upland Wildlife Habitat Management (ac)	5,421	4,359	2,618	2,935	4,601	3,987	19,934
Use Exclusion (ac)			1,350	1,078	2,034	892	4,462
Waste Utilization (ac)					273	55	273
Watering Facility (no)			1		7	2	8
Windbreak/Shelterbelt Establishment (ft)			10,478	1,940		2,484	12,418

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6.2 Cumulative Conservation Status

Conservation plans developed and applied from 1995 to 2005 are projected in the following chart. Landuses displayed reflect the areas where resource concerns have been identified.



- Progress over the last 10 years has been focused on:
 - ~ Nutrient and pest management on cropland
 - ~ Confined Animal Feeding Operations
 - ~ Erosion control on cropland
- Much of the grazed range, pasture, hay land, and forest are untreated, creating an opportunity for assistance.

Note: Estimates are based on information received from local conservationists in the watershed.

6.3 Other Watershed Projects

Watershed Projects, Plans, Studies, and Assessments			
NRCS Watershed Projects ^{/11}		NRCS Watershed Plans, Studies, and Assessments ^{/12}	
Name	Status	Name	Status
Dry Creek Watershed	Complete	None	
319 Projects - KDHE TMDL Plans ^{/6} Watershed Restoration and Protection Strategy Plans ^{/13}			
Milford Lake Watershed Watershed RAPS Development (Kansas State University)			
No-till Demonstration Project (Heartland Crop Residue Alliance)			
Nutrient and TSS Reduction in Surface Waters in North Central Kansas (Clay County Conservation District)			

6.4 Lands Removed from Production through Farm Bill Programs^{/14}

Conservation Reserve Program (CRP) ^a :	42,986 acres
Wetland Restoration Program (WRP):	None
Grassland Reserve Program (GRP):	None
Farm and Ranch Lands Protection Program (FRPP):	None

^a Data from 2006 Farm Service Agency, CRP information

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7.0 Footnotes/Bibliography

All data is provided "as is." There are no warranties, express or implied, including the warranty of fitness for a particular purpose, accompanying this document. Use for general planning purposes only.

1. Common Resource Area Map – Information available online at: <http://efotg.nrcs.usda.gov/treemenuFS.aspx>. Select Section I, E. Maps, 2. Common Resource Area Maps (CRA).
2. Precipitation Map - United States Department of Agriculture, National Weather and Climate Service. Online reference information available at: ftp://gateway1.ftw.nrcs.usda.gov/GatewayCatalogDetails/MetaData/PRCIPANN%5Cprecip_a_ks.txt.
3. National Land Cover Dataset (NLCD) - Originator: U.S. Geological Survey (USGS); Information available online at: <http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html>.
4. 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 because of changes in statistical estimation protocols and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. All definitions are available in the glossary. 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/>.
5. Kansas stream flow data available from the Department of the Interior, U.S. Geological Survey online at: <http://waterdata.usgs.gov/ks/nwis/rt>.
6. Kansas Department of Health and Environment, Total Maximum Daily Loads (TMDL) Strategies, <http://www.kdheks.gov/tmdl/>.
7. U.S. Fish and Wildlife Service, Mountain-Prairie Endangered Species List, Kansas (January 2005) <http://www.mountain-prairie.fws.gov/endspp/CountyLists/KANSAS.htm>. The Kansas Department of Wildlife and Parks, Threatened and Endangered Species, http://www.kdwp.state.ks.us/news/other_services/threatened_and_endangered_species.
8. Data were taken from the 2002 Agricultural Census and adjusted by percent of HUC in the county or by percent of zip code area in the HUC, depending on the level of data available.
9. Conservation participation was estimated using NRCS Social Sciences Technical Note 1801, Guide for Estimating Participation in Conservation, 2004. Four categories of indicators were evaluated: Personal characteristics, farm structural characteristics, perceptions of conservation, and community context. Estimates are based on information received from local conservationists in the watershed.
10. Social capital is an indicator of the community's ability and willingness to work together to solve problems. A high amount of social capital helps a community to be physically healthy, socially progressive, and economically vigorous. A low amount of social capital typically results in community conflict, lack of trust and respect, and unsuccessful attempts to solve problems. The evaluation is based on NRCS Technical Report Release 4.1, March, 2002: Adding up Social Capital: an Investment in Communities. Local conservationists provided information to measure social capital.

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Footnotes/Bibliography Continued

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11. Natural Resources Conservation Service (NRCS), Watershed Projects Planned and Authorized, <http://www.nrcs.usda.gov/programs/watershed/Purpose>. Natural Resources Conservation Service, Kansas online information at: <http://www.ks.nrcs.usda.gov/programs/pl566/>.
12. NRCS, Watershed Plans, Studies, and Assessments completed, http://www.nrcs.usda.gov/programs/watershed/Surveys_Plnq.html#Watershed%20Surveys%20and%20Plan.
13. Kansas Department of Health and Environment, Bureau of Water, Watershed Management Section, <http://www.kdheks.gov/nps/wraps/index.htm>.
14. NRCS, Kansas, Program Information is located at: <http://www.ks.nrcs.usda.gov/programs/>.

7.1 Additional On-line Resources

1. US Environmental Protection Agency (EPA), EnviroMapper for Water, http://map8.epa.gov/scripts/esrimap.dll?name=NHDMapper&Cmd=ZoomInByCat&qc=3&th=6&lc=00010200000110_0000&fipsCode=10250017.
2. US EPA Surf Your Watershed at: http://cfpub.epa.gov/surf/huc.cfm?huc_code=10250017.

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Assessment

Introduction

This assessment matrix has been developed to provide an estimate of conservation systems which may be needed to address resource concerns identified in the RWA Resource Profile. This can also be described as likely future conditions within the watershed.

Conservation Systems have been described in this assessment as systems of conservation practices developed to address resource concerns on various landuses. Systems include benchmark and resource management systems. Benchmark (BM) systems are best described as land units that have had no treatment or one or more resource concerns treated with conservation practices. Resource management systems (RMS) are described as land units which have all known resource concerns treated with conservation practices. The level of treatment to an individual resource concern is credited when the practice(s) used meet or exceed a predetermined level of treatment, known as quality criteria.

Only priority resource concerns have been described in this RWA. These concerns were identified by local resource professionals. Other resource concerns likely exist within the watershed but only make up a small percentage of what needs to be treated. Further investigation and analysis will need to be completed in order to better define all resource concerns.

Resource professionals provided an estimate by percent of conservation systems that will likely be applied to BM systems and untreated land units to address resource concerns identified in the resource profile. These systems are not meant to be comprehensive or address all resource concerns for each land unit in the watershed. Rather only the typical system of conservation practices that could be applied. Numerous alternatives and combinations of practices exist that should be made available to landowners and producers in order to meet their desired level of treatment.

Federal programs identified to implement conservation systems include, but are not limited to; Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP), and WRP. Other funding available for implementation includes various private, local, and state program funds.

This assessment provides estimates only which have been developed using local conservationists and work groups to identify resource concerns, participation rates, and conservation systems likely to be applied. This information was merged with state average cost lists and estimated operation and maintenance costs to generate a cost estimate by individual practice for each conservation system projected to be applied.

Further investigation and analysis within the watershed is required to identify all resource concerns and locations of conservation practices and systems needed to address resource concerns.

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1.0 Cropland

1.1 Dryland

1.1.1 Current Conditions		Cultivated / Non-Cultivated*	Dryland	Irrigated	Total	
Total Cropland		750,000	745,900	4,100	750,000	Acres
Cropland Needing Treatment		440,000	447,540	2,460	450,000	Acres
Cropland Currently at RMS Level**		150,000	149,180	205	149,385	Acres
Cropland Currently at Progressive Level***		225,000	223,770	820	224,590	Acres
Cropland Currently at Untreated Level		375,000	372,950	3,075	376,025	Acres
Typical Cropland-Dryland Management Unit		80				

* Non-cultivated cropland is cropland that has been planted to a perennial crop such as alfalfa.
 ** RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.
 *** Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.
 Note: For this analysis, all untreated units and progressive systems will be treated to RMS level.

Current Conditions for Cropland - Dryland										
Management Systems		Quantity		Costs		Effects				Note: Effects are numerical values placed on benchmark conditions and degree of change in condition by conservation system(s) application. Scale range from -5 (most damaging to resources) to +5 (least damaging, best protection offered by treatment).
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quality, Surface	Human Economics	
BM1		Ac.	372,950			-3	-1	-3	-2	
	Conservation Cropping Rotation	Ac.	372,950							
	Residue Management	Ac.	372,950							
BM2		Ac.	223,770			0	-1	-2	-1	
	Conservation Cropping Rotation	Ac.	223,770							
	Residue Management	Ac.	223,770							
	Terrace	Ac.	67,131							
RMS		Ac.	149,180			+1	0	0	+1	
	Conservation Cropping Rotation	Ac.	149,180							
	Terrace	Ac.	44,754							
	Conservation Tillage	Ac.	149,180							
	Nutrient Management	Ac.	149,180							
	Pest Management	Ac.	149,180							

Desired/Estimated Participation Rates			
Proposed Practice Change	Rate	Acres	
Cropland-Dryland Conservation System	66%	295,376	Estimates: 16,600 Acres needing terraces 440,000 Acres needing treatment 144,624 Acres are not expected to be treated
Cropland-Irrigation Conservation System	66%	1,624	
Total		297,000	

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1.1.2 Future Conditions		Total	BM1	BM2	RMS1	RMS2	RMS3						
Crop - Dryland		745,900	120,537	180,806	385,481	14,769	44,306						
Future Conditions for Cropland - Dryland													
Management Systems		Quantity		Costs		Effects				Implementation			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quality, Surface	Human Economics	EQIP	WHIP	WRP	Other
BM1		Ac.	120,537			-3	-1	-3	-2				
	Conservation Cropping Rotation	Ac.	120,537		\$72,322								
	Residue Management	Ac.	120,537		\$2,652								
BM2		Ac.	180,806			0	-1	-2	-1				
	Conservation Cropping Rotation	Ac.	180,806		\$108,484								
	Residue Management	Ac.	180,806		\$3,978								
	Terrace	Ac.	54,242		\$6,443,932								
RMS1		Ac.	236,301			+1	+1	+1	+1				
	Conservation Cropping Rotation	Ac.	236,301	\$1,417,807	\$141,781					X			
	Grassed Waterway	Ac.	2,640	\$2,640,000	\$79,200					X			X
	Terrace	LF	6,969,600	\$6,272,640	\$156,816					X			X
	Conservation Tillage	Ac.	236,301	\$2,126,710	\$212,671					X			
	Terrace Restoration	LF	20,064,000	\$18,057,600	\$451,440					X			
	Filter Strip	Ac.	11,815	\$708,903	\$3,545					X			X
	Nutrient Management	Ac.	236,301	\$1,890,409	\$189,041					X			
	Pest Management	Ac.	236,301	\$1,417,807	\$141,781					X			
RMS2		Ac.	14,769			+4	+4	+4	+3				
	Conservation Cover	Ac.	14,769	\$221,532,300	\$2,215,323					X	X		X
	Native Grass Seeding	Ac.	14,769	\$738,441	\$3,692					X	X		X
RMS3		Ac.	193,486			+3	+2	+2	+2				
	Conservation Cropping Rotation	Ac.	193,486	\$1,160,919	\$116,092					X			
	Residue Management	Ac.	193,486	\$212,835	\$4,257					X			
	Nutrient Management	Ac.	193,486	\$1,547,892	\$154,789					X			
	Pest Management	Ac.	193,486	\$1,160,919	\$116,092					X			
	Terrace Restoration	Ft.	3,762,000	\$3,385,800	\$84,645					X			
	Filter Strip	Ac.	9,674	\$580,459	\$2,902					X			X
	Terrace	Ft.	1,306,800	\$1,176,120	\$29,403					X			X
	Grassed Waterway	Ac.	495	\$495,000	\$14,850					X			X
Total RMS Costs					\$266,027,561		\$10,734,836						

1.1.3 Potential RMS Effects Summary for Cropland - Dryland		
Cost Items and Programs	Costs	O&M Costs
Potential Farm Bill Programs		
Annual Management Incentives (3 yrs - Incentive Payments)		\$2,591,496
Operator Investment (25% Cost Share)	\$66,506,890	
Federal Costs (75% Cost Share)	\$199,520,670	
Total RMS Costs	\$266,027,561	\$10,734,836
Estimated Level of Participation	66%	
Total acres projected to be in RMS System	444,556	
Total Annual Crop Production Benefit	\$2,767,624	
Beneficial Effects of Proposed RMS System		
Decreases Soil Erosion		
Improves soil condition		
Reduces Transport of Pollutants and Sediment		
Potentially improves economic gains		

1.0 Cropland

1.2 Irrigated

1.2.1 Current Conditions	Cultivated / Non-Cultivated*	Dryland	Irrigated	Total	
Total Cropland	750,000	745,900	4,100	750,000	Acres
Cropland Needing Treatment	440,000	447,540	2,460	450,000	Acres
Cropland Currently at RMS Level**	120,000	119,344	205	119,549	Acres
Cropland Currently at Progressive Level***	202,500	201,393	820	202,213	Acres
Cropland Currently at Untreated Level	427,500	425,163	3,075	428,238	Acres
Typical Cropland-Dryland Management Unit	80				

* Non-cultivated cropland is cropland that has been planted to a perennial crop such as alfalfa.
 ** RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.
 *** Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.
 Note: For this analysis, all Untreated units and progressive systems will be treated to RMS level.

Current Conditions for Cropland - Irrigated										
Management Systems	Practices	Quantity		Costs		Effects				Note: Effects are numerical values placed on benchmark conditions and degree of change in condition by conservation system(s) application. Scale range from -5 (most damaging to resources) to +5 (least damaging, best protection offered by treatment).
		Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quality, Surface	Human Economics	
BM1		Ac.	3,075			-3	-1	-3	-2	
	Conservation Cropping Rotation	Ac.	3,075							
	Conventional Tillage	Ac.	3,075							
BM2		Ac.	820			0	-1	0	-1	
	Conservation Cropping Rotation	Ac.	820							
	Residue Management	Ac.	820							
RMS1		Ac.	205			+2	0	+1	+1	
	Conservation Cropping Rotation	Ac.	205							
	Conservation Tillage	Ac.	205							
	Nutrient Management	Ac.	205							
	Pest Management	Ac.	205							
	Irrigation Water Management	Ac.	205							

Desired/Estimated Participation Rates				
Proposed Practice Change	Rate	Acres	Estimates:	
Cropland-Dryland Conservation System	66%	295,376	2,460 Acres needing treatment	
Cropland-Irrigation Conservation System	66%	1,624	836 Acres are not expected to be treated	
Total		297,000		

1.2.2 Future Conditions	Total	BM1	BM2	RMS1	RMS3	RMS4
Crop - Irrigated	4,100	991	1,486	731	568	325

Future Conditions for Cropland - Irrigated													
Management Systems	Practices	Quantity		Costs		Effects				Implementation			
		Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quality, Surface	Human Economics	EQUIP	WHIP	WRP	Other
BM1		Ac.	991			-3	-1	-3	-2				
	Conservation Cropping Rotation	Ac.	991		\$594								
	Residue Management	Ac.	991		\$22								
BM2		Ac.	1,486			0	-1	0	-1				
	Conservation Cropping Rotation	Ac.	1,486		\$892								
	Residue Management	Ac.	1,486		\$33								
	Irrigation Water Management	Ac.	1,486		\$1,634								
		Ac.	936			+2	0	+1	+1				
	Conservation Cropping Rotation	Ac.	936	\$5,614	\$561					X			
	Residue Management	Ac.	936	\$1,029	\$21					X			
	Nutrient Management	Ac.	936	\$7,485	\$748					X			
	Pest Management	Ac.	936	\$5,614	\$561					X			
	Irrigation Water Management	Ac.	936	\$10,292	\$1,029					X			
		Ac.	568			+3	+2	+2	+2				
	Conservation Cropping Rotation	Ac.	568	\$3,410	\$341					X			
(convert to dryland)	Conservation Tillage	Ac.	568	\$5,114	\$511					X			
	Nutrient Management	Ac.	568	\$4,546	\$455					X			
	Pest Management	Ac.	568	\$3,410	\$341					X			
RMS4 (convert to low pressure)		Ac.	325			+2	+1	+1	+1				
	Conservation Cropping Rotation	Ac.	325	\$1,948	\$195					X			
	Conservation Tillage	Ac.	325	\$2,922	\$292					X			
	Irrigation Water Management	Ft.	325	\$3,572	\$357					X			
	Irrigation System, Sprinkler (conversion)	Ft.	325	\$18,509,040	\$92,545					X			X
Total RMS Costs													
						\$18,563,996	\$101,133						

1.2.3 Potential RMS Effects Summary for Cropland - Irrigated			
Cost Items and Programs		Costs	O&M Costs
Potential Farm Bill Programs			
Annual Management Incentives (3 yrs - Incentive Payments)			\$5,413
Operator Investment (25% Cost Share)		\$4,640,999	
Federal Costs (75% Cost Share)		\$13,922,997	
Total RMS Costs		\$18,563,996	\$101,133
Estimated Level of Participation		66%	
Total acres projected to be in RMS System		1,624	
Total Annual Crop Production Benefit		\$186,651	
Beneficial Effects of Proposed RMS System			
Improves soil condition			
Increases soil organic matter			
Improves water quality by reducing erosion and sediment delivery to streams			
Decreases aquifer overdraft			



2.0 Grazed Range

2.1 Native Grassland

2.1.1 Current Conditions	Grazed	Ungrazed	Total	
Total Grazed Range	400,000	0	400,000	Acres
Grazed Range Needing Treatment	280,000	0	280,000	
Total Range with Brush Invasion	160,000	0	160,000	Acres
Typical Range Management Unit	160			

* RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.

** Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.

Note: For this analysis, all untreated units and progressive systems will be treated to RMS level.

Current Conditions for Grazed Range										
Grazed Range		Quantity		Costs		Effects				Note: Effects are numerical values placed on benchmark conditions and degree of change in condition by conservation system(s) application. Scale range from -5 (most damaging to resources) to +5 (least damaging, best protection offered by treatment).
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Plant Condition	Animal: Domestic	Human Economics	
BM1		Ac.	280,000			-3	-3	-1	-2	
	Pond	No.	438							
	Watering Facility	No.	1,750							
	Fence	Mi.	3,500							
BM2		Ac.	120,000			+1	+1	+1	+1	
	Prescribed Grazing	Ac.	120,000							
	Pond	No.	188							
	Watering Facility	No.	750							
	Pipeline	Ft.	150,000							
	Fence	Mi.	1,500							

Desired/Estimated Participation Rates			
Proposed Practice Change	Rate	Acres	
Grazing System	66%	184,800	
Brush Management	66%	105,600	
Prescribed Burning	66%	184,800	

2.1.2 Future Conditions	Total	BM1	BM2	RMS
Grazed Range	400,000	95,200	120,000	184,800

Future Conditions for Grazed Range													
Grazed Range and Forestlands		Quantity		Costs		Effects				Implementation			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Plant Condition	Animal: Domestic	Human Economics	EQIP	WHIP	WRP	Other
BM1		Ac.	95,200			-3	-3	-1	-2				
	Pond	No.	149		\$17,850								
	Watering Facility	No.	595		\$27,370								
	Fence	Mi.	1,190		\$251,328								
BM2		Ac.	120,000			+1	+1	+1	+1				
	Prescribed Grazing	Ac.	120,000		\$118,800								
	Pond	No.	188		\$22,500								
	Watering Facility	No.	750		\$34,500								
	Pipeline	Ft.	1,950,000		\$35,100								
	Fence	Mi.	1,500		\$316,800								
RMS		Ac.	184,800			+3	+3	+3	+2				
	Prescribed Grazing	Ac.	184,800	\$554,400	\$182,952					X			
	Fence	LF	310,200	\$620,400	\$12,408					X			X
	Brush Management	Ac.	105,600	\$5,280,000	\$158,400					X	X		
	Prescribed Burning	Ac.	184,800	\$369,600	\$370					X	X		
	Pond	No.	858	\$10,296,000	\$102,960					X	X		X
	Watering Facility	No.	264	\$607,200	\$12,144					X			X
	Pipeline	Ft.	290,400	\$522,720	\$5,227					X			X
	Spring Development	No.	79	\$198,000	\$3,960					X			X
	Pest Management	Ac.	73,920	\$443,520	\$44,352					X	X		X
	Streambank & Shoreline Protection	Ft.	204,600	\$12,276,000	\$245,520					X			X
Total RMS Costs					\$31,167,840								\$1,592,541

2.1.3 Potential RMS Effects Summary for Grazed Range			
Cost Items and Programs		Costs	O&M Costs
Potential Farm Bill Programs			
Annual Management Incentives (3 yrs - Incentive Payments)			\$227,674
Operator Investment (25% Cost Share)		\$7,791,960	
Federal Costs (75% Cost Share)		\$23,375,880	
Total RMS Costs		\$31,167,840	\$1,592,541
Estimated Level of Participation		66%	
Total acres projected to be in RMS System		184,800	
Total Annual Grazing Production Benefits		\$327,604	
Beneficial Effects of Proposed RMS System			
Reduces Soil Erosion			
Improves plant condition, health and vigor			
Increases Available Stockwater Supply			
Potentially improves economic gains			



3.0 Pasture/Hay Land

3.1 Non-irrigated Pasture/Hay Land

3.1.1 Current Conditions	Grazed	Ungrazed	Total	
Total Pasture/Hay Land	25,000	0	25,000	Acres
Pasture/Hay Land Needing Treatment	19,000	0	19,000	Acres
Typical Pasture/Hay Land Management Unit	80			

* RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.
 ** Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.
 Note: For this analysis, all untreated units and progressive systems will be treated to RMS level.

Current Conditions for Non-irrigated Pasture/Hayland						
Pasture		Quantity		Costs		Effects
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Plant Condition
BM1		Ac.	19,000			-3
	Pond	No.	119			
	Watering Facility	No.	119			
	Pipeline	Ft.	23,750			
	Fence	Mi.	356			
BM2		Ac.	6,000			+1
	Prescribed Grazing	Ac.	6,000			
	Pond	No.	9			
	Watering Facility	No.	66			
	Pipeline	Ft.	13,125			
	Fence	Mi.	113			
Desired/Estimated Participation Rates						
	Proposed Practice Change	Rate	Acres			
	Pasture/Hay Land System	66%	12,540			

Note: Effects are numerical values placed on benchmark conditions and degree of change in condition by conservation system(s) application. Scale range from -5 (most damaging to resources) to +5 (least damaging, best protection offered by treatment).

3.1.2 Future Conditions	Total	BM1	BM2	RMS
Pasture/Hay Land	25,000	6,460	6,000	12,540

Future Conditions for Non-irrigated Pasture/Hay Land										
Pasture/Hay Land		Quantity		Costs		Effects	Implementation			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Plant Condition	EQUIP	WHP	WRP	Other
BM1		Ac.	6,460			-3				
	Pond	No.	10		\$1,211					
	Water Facility	No.	30		\$3,634					
	Fence	Mi.	81		\$17,054					
BM2		Ac.	6,000			+1				
	Prescribed Grazing	Ac.	6,000		\$5,940					
	Pond	No.	9		\$1,125					
	Water Facility	No.	28		\$3,375					
	Pipeline	Ft.	73,125		\$1,316					
	Fence	Mi.	75		\$15,840					
RMS		Ac.	12,540			+3				
	Prescribed Grazing	Ac.	12,540	\$37,620	\$12,415		X			
	Nutrient Management	Ac.	12,540	\$100,320	\$10,032		X			
	Pest Management	Ac.	12,540	\$75,240	\$7,524		X			
	Water Facility	No.	157	\$940,500	\$18,810		X			X
	Pipeline	Ft.	172,425	\$310,365	\$3,104		X			X
	Total RMS Costs			\$1,464,045	\$101,380					

3.1.3 Potential RMS Effects Summary for Non-irrigated Pasture/Hay Land		
Cost Items and Programs	Costs	O&M Costs
Potential Farm Bill Programs		
Annual Management Incentives (3 yrs - Incentive Payments)		\$29,971
Operator Investment (25% Cost Share)	\$366,011	
Federal Costs (75% Cost Share)	\$1,098,034	
Total RMS Costs	\$1,464,045	\$101,380
Estimated Level of Participation	66%	
Total acres projected to be in RMS System	12,540	
Total Annual Forage Production Benefits	\$15,654	
Beneficial Effects of Proposed RMS System		
Improves plant condition, health and vigor		

4.0 Wildlife

4.1 Wildlife - Private

4.1.1 Current Conditions	Wildlife	Private	Public	Total	
Total Wildlife	10,000	8,000	2,000	10,000	Acres
Wildlife Needing Treatment	7,500	6,000	1,500	7,500	Acres
Wildlife Currently at RMS Level**	100	80	20	100	Acres
Wildlife Currently at Progressive Level***	200	160	40	200	Acres
Wildlife Currently at Untreated Level	9,700	7,760	1,940	9,700	Acres

* RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.

** Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.

Note: For this analysis, identified treatment units will be treated to RMS level at the expected adoption rate.

Current Conditions for Wildlife - Private

Management Systems		Quantity		Costs		Effects	Note: Effects are numerical values placed on benchmark conditions and degree of change in condition by conservation system(s) application. Scale ranges from -5 (most damaging) to +5 (least damaging)
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Animal: Fish and Wildlife	
BM		Ac.	7,760			-4	
	No Treatment	Ac.	7,760				
RMS		Ac.	240			+3	
	Upland Wildlife Habitat Management	Ac.	240				

Desired/Estimated Participation Rates

Proposed Practice Change	Rate	Acres
Conservation System Wildlife - Private	66%	3,960
Conservation System Wildlife - Public	0%	0
Total		3,960

4.1.2 Future Conditions	Total	BM	RMS
Conservation Systems Wildlife - Private (Ac.)	8,000	3,800	4,200

Future Conditions for Wildlife - Private

Management Systems		Quantity		Costs		Effects	Implementation				
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Animal: Fish and Wildlife	EQIP	WHIP	WRP	Other	
BM1		Ac.	3,800			-4					
	No Treatment	Ac.	3,800		\$950						
RMS1		Ac.	4,200			+3					
	Upland Wildlife Habitat Management	Ac.	4,200	\$378,000	\$4,725		X	X	X	X	
	Restoration & Management of Declining Habitats	Ac.	1,050	\$115,500	\$1,155		X	X	X	X	
	Prescribed Burning	Ac.	4,200	\$8,400	\$8		X	X			
	Wildlife Watering Facility	Ac.	105	\$42,000	\$109		X	X		X	
Total RMS Costs				\$543,900	\$6,948						

4.1.3 Potential RMS Effects Summary for Wildlife - Private

Cost Items and Programs	Costs	O&M Costs
Potential Farm Bill Programs		
Annual Management Incentives (3 yrs - Incentive Payments)		\$0
Operator Investment (25% Cost Share)	\$135,975	
Federal Costs (75% Cost Share)	\$407,925	
Total RMS Costs	\$543,900	\$6,948
Estimated Level of Participation	66%	
Total acres projected to be in RMS System	4,200	
Total Annual Wildlife Production Benefit	\$5,508	
Beneficial Effects of Proposed RMS System		
Improves Wildlife Stand Health and Plant Condition		