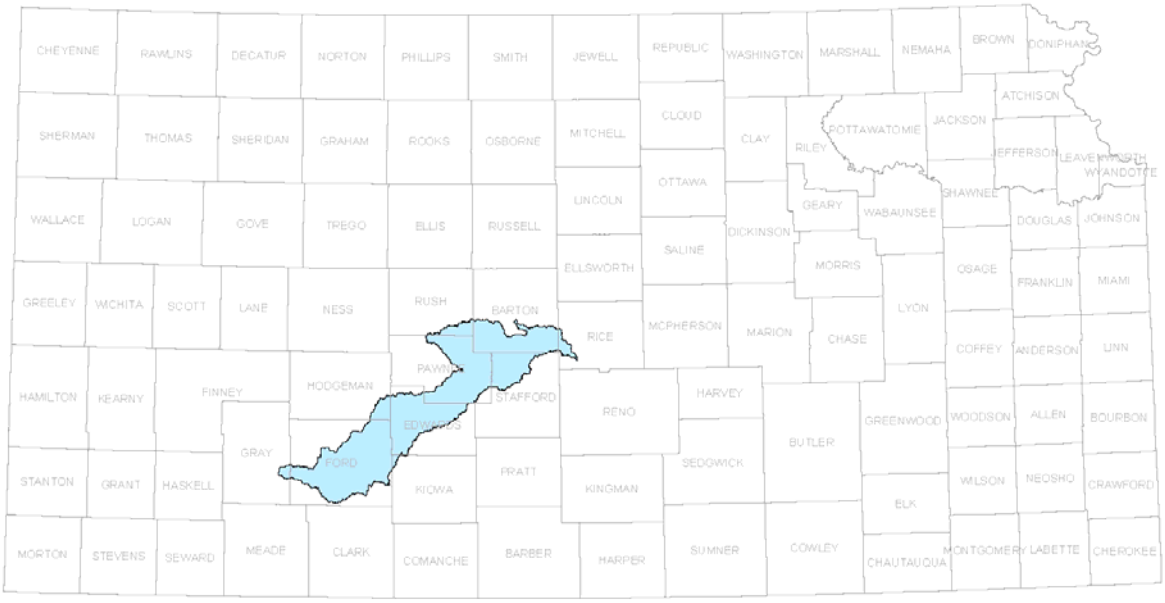
KANSAS
Rapid Watershed Assessment

Coon-Pickerel Watershed
Hydrologic Unit Code – 11030004



September 2006

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Natural Resources Conservation Service

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Resource Profile

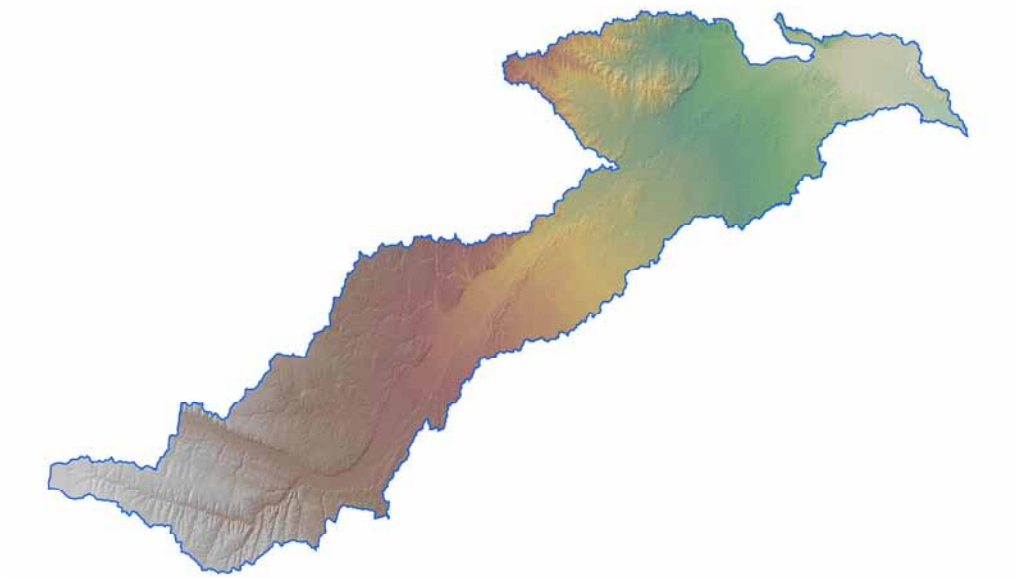
1.0 Purpose

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 Coon-Pickerel sub-basin's natural resources, resource concerns, conservation needs, and ability to resolve natural resource issues and concerns.

2.0 Introduction

The Coon-Pickerel 8-Digit Hydrologic Unit Code (HUC) sub-basin is comprised of 1,198,405 acres in south central Kansas and includes the counties of Gray, Hodgeman, Ford, Rush, Pawnee, Edwards, Kiowa, Barton, Stafford, and Rice. This sub-basin is located in the Upper Arkansas River Basin, and drains into the Arkansas River as it flows from southwest to northeast. According to the National Land Cover Data (NLCD), approximately 50 percent of the sub-basin is in grain and row crop; 49 percent is in grassland, pasture, and hay; and the rest is in other various land uses.

Relief Map



Resource concerns are numerous in the sub-basin. They include, but are not limited to, soil erosion, deteriorating soil condition, diminishing surface water quality, deteriorating plant conditions, loss of fish and wildlife habitat, and inadequate water and forage production for domestic livestock. 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.

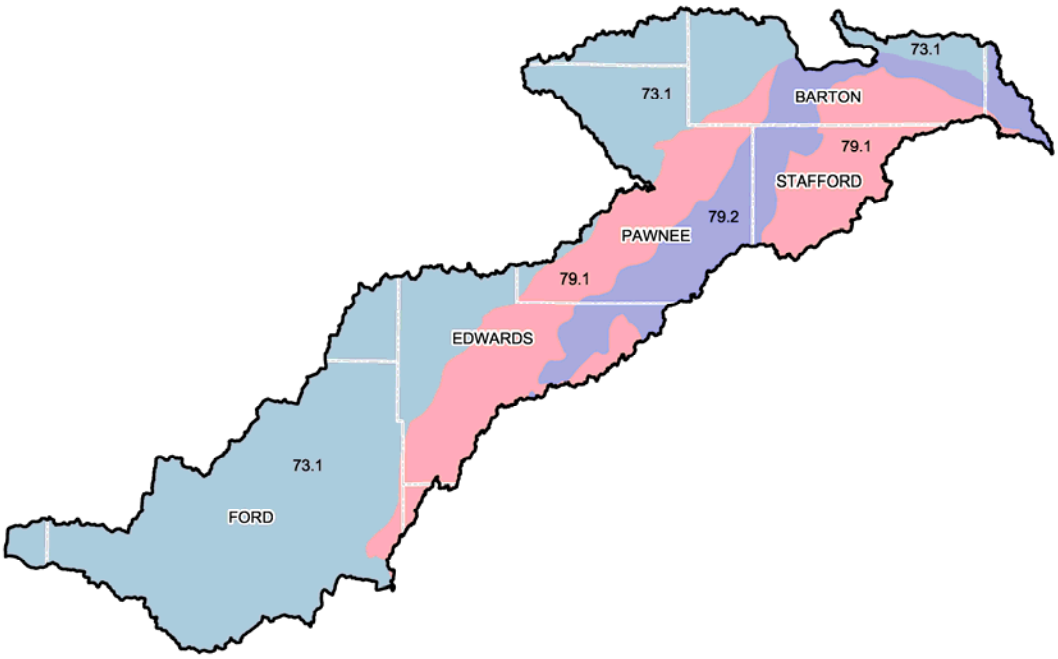
There are approximately 1,290 farms and 1,770 operators in the Coon-Pickerel sub-basin. The estimated farm size in 2002 was 1,020 acres, an increase of 11 percent from the 1987 estimate.

Ten Natural Resources Conservation Service (NRCS) service centers, 10 county conservation districts, and the Central Prairie and the Coronado Crossing (pending) Resource Conservation and Development (RC&D) areas provide conservation assistance in the sub-basin.

3.0 Physical Description

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

3.1 Common Resource Area (CRA) Map[1]



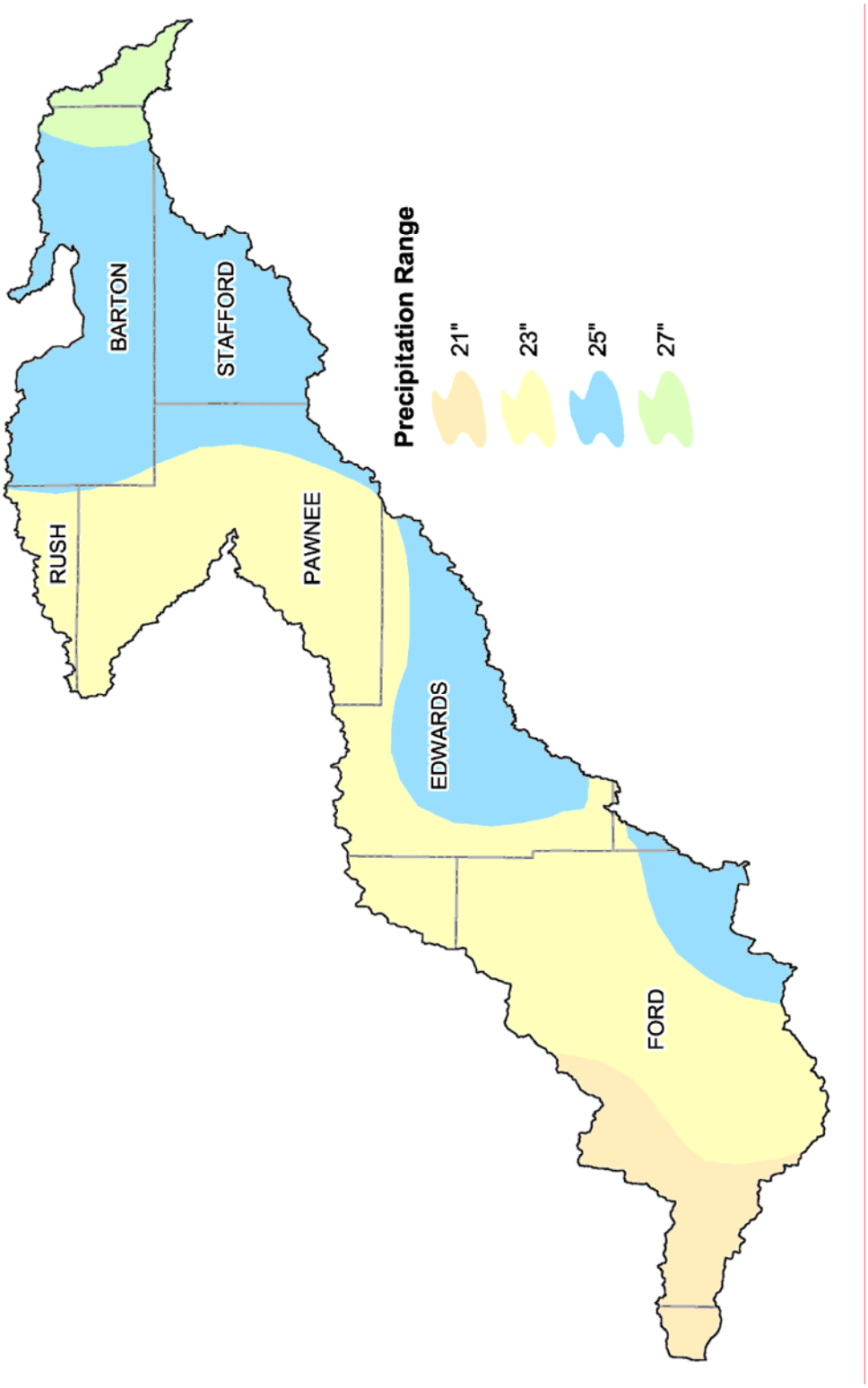
73.1 – Rolling Plains and Breaks: The Rolling Plains and Breaks CRA is dissected plains having broad undulating to rolling ridge-tops, loess mantled, and hilly to steep side-slopes. Local relief reaches 300 feet and is dissected with narrow drainage ways and river valleys. Soils are deep on the ridge-tops 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.

79.1 – Great Bend Sand Plains: The Great Bend Sand Plains CRA is narrow, undulating to rolling hills and valleys consisting of irregular sand dunes stabilized by native grasses. Local relief is measured in tens of feet. Soils are deep and formed in eolian sand. Pre-settlement vegetation was tall grass prairies. Nearly all of this area is in rangeland. Some nearly level are cultivated for growing irrigated corn and alfalfa.

79.2 – Great Bend Alluvial Plain: The Great Bend Alluvial Plain CRA is a level to nearly level Arkansas River paleoterrace mantled by loess and underlain by unconsolidated alluvial sediments. This CRA inter-fingers in the Great Bend Sand Plains as narrow flood plains 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 cropland, dominantly small grains and hay.

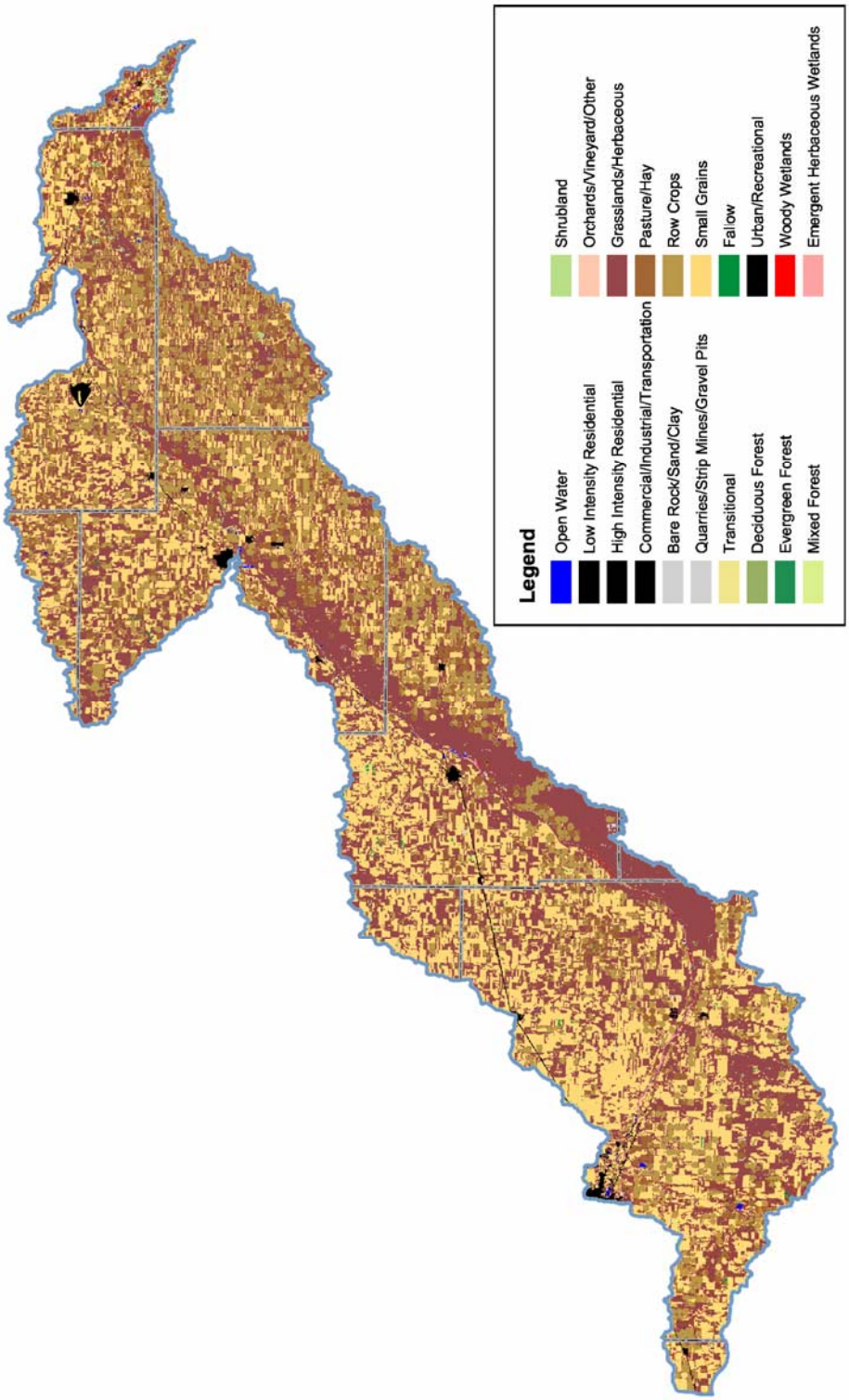
3.2 Precipitation Map[12]

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



3.3 Land Use and Land Cover Distribution Map[13]

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



3.3.1 Land Use and Land Cover Summary Table[13]

Land Cover / Land Use	Ownership							
	Public		Private		Tribal			
	Acres	%	Acres	%	Acres	%	Totals	%
Open Water			1,204	*			1,204	*
Low Intensity Residential			2,090	*			2,090	*
High Intensity Residential			1,333	*			1,333	*
Commercial/Industrial/ Transportation			4,108	*			4,108	*
Bare Rock/Sand/Clay			596	*			596	*
Quarries/Strip Mines/Gravel Pits			186	*			186	*
Transitional			2	*			2	*
Deciduous Forest			1,809	*			1,809	*
Evergreen Forest			43	*			43	*
Mixed Forest			1	*			1	*
Shrubland			3,128	*			3,128	*
Grasslands/Herbaceous	620	*	493,419	41			494,039	41
Pasture/Hay			89,333	8			89,333	8
Row Crops			180,478	15			180,478	15
Small Grains	172	*	413,947	35			414,119	35
Fallow			1,137	*			1,137	*
Urban/Recreational			1,608	*			1,608	*
Woody Wetlands			800	*			800	*
Emergent Herbaceous Wetlands			2,392	*			2,392	*
HUC Totals[a]	115	*	1,198,290	100	0	0	1,198,405	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:

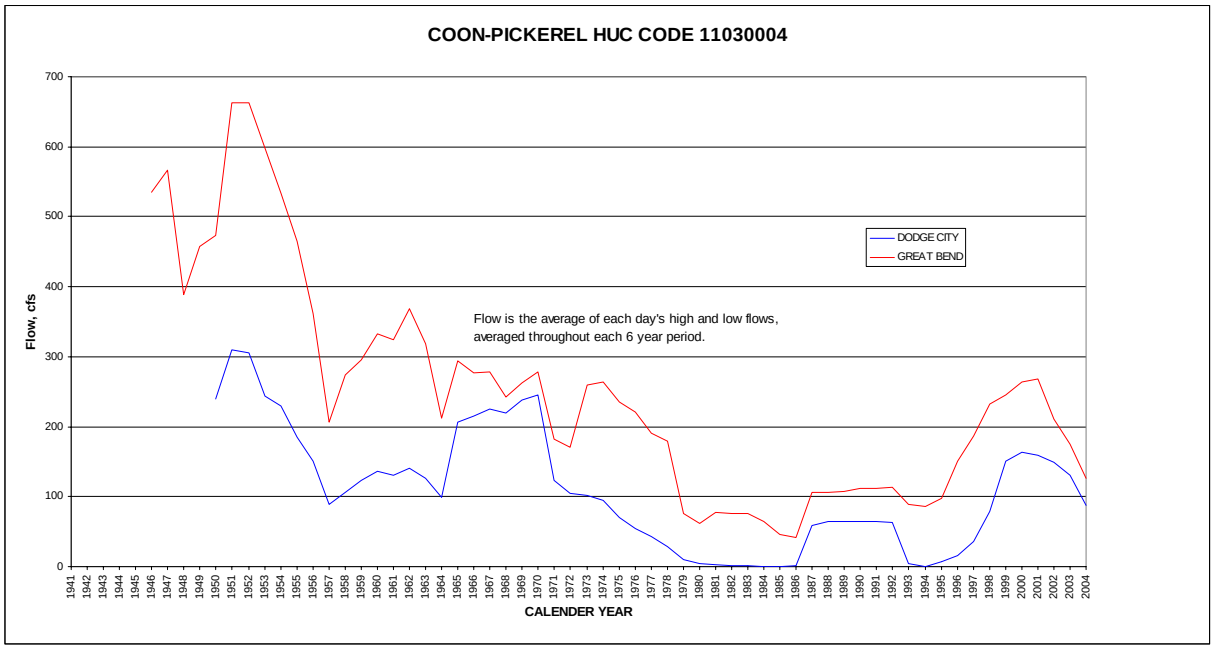
- Small grains and row crops are the predominant commodities grown in rotation on cropland. Corn is predominantly grown under irrigation.
- Grasslands/Herbaceous and Pasture/Hay makes up approximately 49 percent of the watershed.
- Pasture is included on mostly beef operations, as well as a few small farms and ranches.
- Urban land comprises less than 1 percent of the HUC.

Irrigated Lands[14]	Percent of Cropland	Percent of HUC
	<23%	<17%

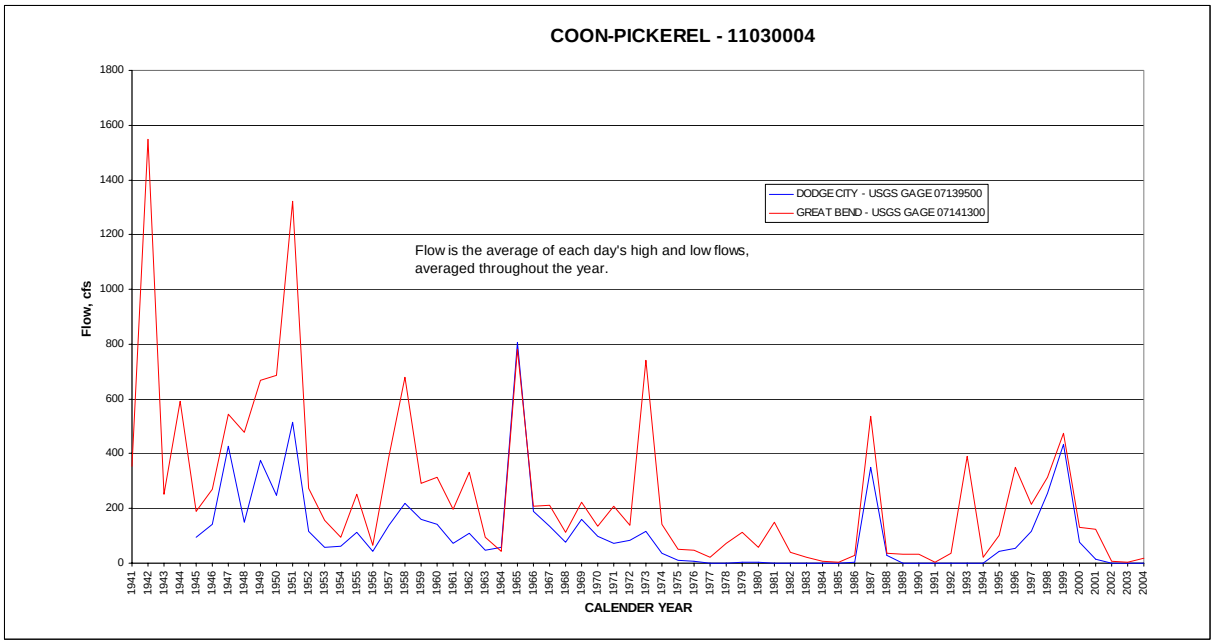
3.4 Stream Flow Data[15]

Stream flow data has been collected since 1941. There are seven 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 Arkansas River: one at Dodge City and one at Great Bend.

Annual Peak Flow



Daily Average Flow



3.5 Other Physical Descriptions

		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights[16]	Surface	7,800	8,700
	Well	492,600	631,900
	Total Irrigated Adjudicated Water Rights	**500,400**	**640,600**
		MILES	
Stream Data[15]	Total Miles – Major (100K Hydro Geographic Information System [GIS] Layer)	501	
		ACRES	**PERCENT**
Land Cover / Use[13] Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer	Bare Rock/Sand/Clay	62	0.1
	Commercial/Industrial/Transportation	97	0.2
	Deciduous Forest	559	0.9
	Emergent Herbaceous Wetlands	953	1.5
	Evergreen Forest	30	0.0
	Fallow	37	0.1
	Grasslands/Herbaceous	32,121	52.2
	High Intensity Residential	42	0.1
	Low Intensity Residential	47	0.1
	Open Water	339	0.6
	Pasture/Hay	4,665	7.6
	Quarries/Strip Mines/Gravel Pits	9	0.0
	Row Crops	5,798	9.4
	Shrubland	383	0.6
	Small Grains	16,072	26.1
	Urban/Recreational	33	0.1
	Woody Wetlands	315	0.5
	Total Acres of 100-foot Stream Buffers	**61,561**	**100**
		ACRES	
Land Capability Class[14]	**1** – slight limitations		
	2 – moderate limitations		
	3 – severe limitations	861,000	
	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	204,000	
	Other	40,000	

4.0 Resource Concerns

Resource concerns are issues related to the natural environment. Natural resources include soil, water, air, plants, animals, and humans. Local conservationists identified major resource issues that affect the Coon-Pickerel sub-basin.

4.1 Summary of Resource Concerns

Resource Concerns / Issues by Land Use								
Soil, Water, Air, Plant, Animal, plus Human (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				
	Wind		X	X				
	Ephemeral Gully		X	X				
	Streambank				X			
Soil Condition	Organic Matter Depletion		X	X				
	Rangeland Site Stability				X			
	Compaction		X	X				
Water Quantity	Rangeland Hydrologic Cycle				X			
	Inefficient Water Use on Irrigated Land		X	X				
	Aquifer Overdraft			X				
Water Quality, Surface	Harmful Levels of Pesticides		X	X				
	Excessive Nutrients and Organics		X	X				
Plant Condition	Productivity, Health and Vigor	X			X			
Animal: Fish and Wildlife	Inadequate Cover/Shelter				X			
Animal: Domestic	Inadequate Quantities and Quality of Feed and Forage				X			
	Inadequate Stock Water				X			
Human Economics	High Capital/Financial Costs		X	X				

Pasture / Hay

- Pastureland is commonly over-utilized, lacks needed fertility, affected by timing of grazing, and affected by invasive weeds.
- Hay land lacks needed fertility, affected by timing of haying, and affected by invasive weeds.

Grain and Row Crops

- Residue, nutrient, and pest management; vegetative practices; and structural practices are necessary to control erosion, protect water quality, and improve soil conditions.
- Inefficient water use has created aquifer overdraft for irrigated crops in groundwater management areas.
- For cropland, sheet and rill erosion is greater on steeper slopes.
- Conventional tillage has caused organic matter depletion and compaction concerns on cropland.

Grazed Range

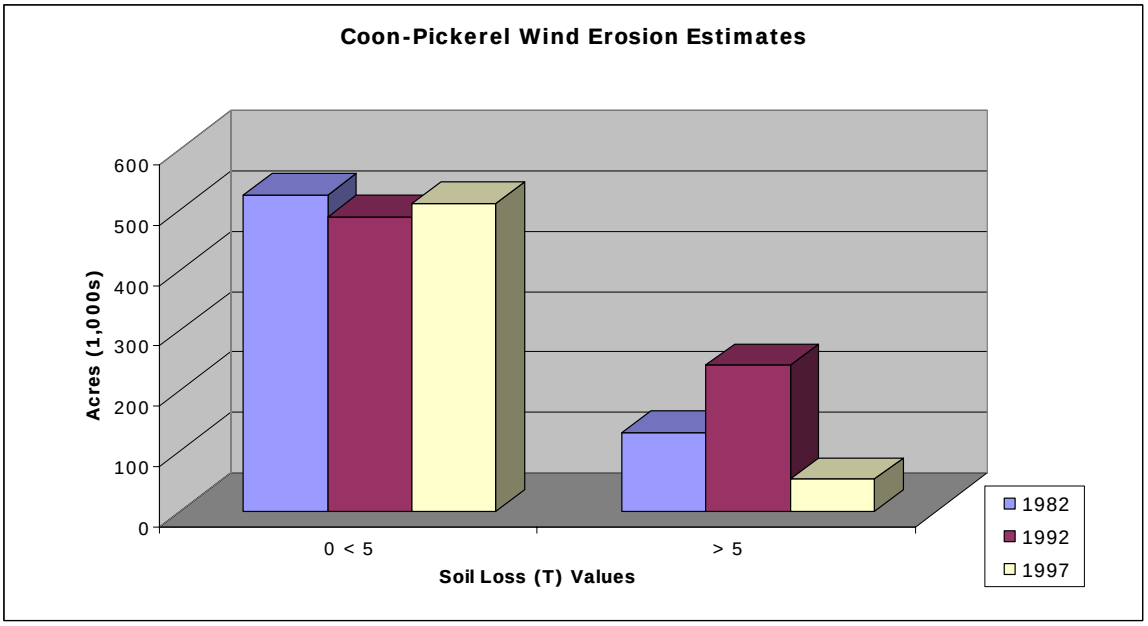
- Rangeland is commonly over-utilized year after year, which depletes adequate forage supply, deteriorates rangeland plant health, and affects rangeland hydrology.
- Prescribed burning is not widely utilized to aid in management of invasive plants, grazing distribution, or wildlife needs.
- Streambank erosion is a concern in part due to over utilization of the plant resource and unabated livestock access to stream corridors and banks.

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[14]

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 attach to soil colloids and are transported into the stream systems.



- Total acres eroding due to wind over the soil loss tolerance (T) of 5 tons per acre has been reduced on nearly 78,000 acres of cropland and pastureland from 1982 to 1997.
- National Resources Inventory (NRI) estimates indicate that approximately 52,000 acres of agricultural land still had wind erosion rates above a sustainable level in 1997.
- Through NRCS programs, many farmers and ranchers have applied conservation practices to reduce the effects of erosion by wind. NRI estimates indicate there is still a need to address wind erosion within the watershed on cropland and pastureland.

4.3 Water Quality Conditions[14]

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

For up-to-date water quality condition information, visit the KDHE Web site: 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	0	58	0	9	1	0
Number of Permitted Animals	0	353,345	0	4,207	0	0

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 and are comprised of water intakes, wells, and water treatment facilities. The KDHE oversees more than 1,080 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 approximately 93 Active Public Water Supply Wells located within this watershed. Due to the lack of surface water in this watershed, all of the public water supply is pulled from groundwater. Major groundwater aquifers underlying this watershed include the High Plains and Dakota Aquifers along with alluvial aquifers of the Arkansas River and its tributaries.

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 an analysis of the susceptibility of the water source to the potential contaminants. 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.

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 aquatic life use, secondary contact recreation, and food procurement. The table below lists designated uses by stream and impairments in the watershed.

Designated Uses Table

Stream Name	AL	CR	DS	FP	GR	IW	IR	LW
Arkansas River	E	b	X	X	X	X	X	X
Arkansas River	E	b	X	X	X	X	X	X
Arkansas River	E	b	X	X	X	X	X	X
Arkansas River	E	b	X	X	X	X	X	X
Arkansas River	E	b	X	X	X	X	X	X
Arkansas River	E	b	X	X	X	X	X	X
Arkansas River	S	b	X	X	X	X	X	X
Ash Creek	E	b						
Coon Creek	E	b		X				
Coon Creek	E	b		X				
Cow Creek	E	b						
Dry Walnut Creek	E	b		X				
Little Coon Creek	E	b						
Mulberry Creek	E	b						
Pickerel Creek	E	b						
White Woman Creek	E	b						

AL = Aquatic Life Support
CR = Contact Recreation
DS = Domestic Water Supply
FP = Food Procurement
GR = Groundwater Recharge
IW = Industrial Water Supply
IR = Irrigation Water Supply
LW = Livestock Water Supply

E = Expected Aquatic Life Use Water
S = Special Aquatic Life Use Water
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

4.3.4 Total Maximum Daily Loads

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 the watershed 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 compromising 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.

Stream Data	
Total Miles – Major (100K Hydro GIS Layer)	501
High Priority 303d/TMDL streams (KDHE, 2002) miles	240

2006 Impaired Waters with TMDLs			
Stream Segment	Stream/Lake with TMDL	Priority for TMDL Implementation	Impairments
1	Arkansas River below Great Bend	Medium	Nutrients/BOD
1,2,4,5,6,10,11	Arkansas River from Dodge City to Great Bend	Medium	Sulfate
10	Arkansas River from Ford to Kinsley	Medium	Fluoride
1,2,4,5,6,10,11	Arkansas River from Dodge City to Great Bend	High	Bacteria
13	Pickerel Creek	High	Bacteria
3	Ash Creek	High	Bacteria

2006 Impaired Waters Needing TMDLs	
Impaired Stream/Lake	Impairment
Arkansas River below Dodge City	Boron
Arkansas River below Dodge City	Fluoride
Arkansas River from Dodge City to Great Bend	Selenium
Mulberry Creek	Dissolved Oxygen

Impairment definitions:

Nutrients/Biological Oxygen Demand (BOD): Excessive nutrients, toxic ammonia, or organic matter is present in the stream decreasing the quality of biological organisms residing in the stream.

Sulfate: Sulfate is a naturally occurring mineral that can cause taste and odor problems in drinking water. Sulfates are dissolved into groundwater as the water moves through gypsum rock formations. The water quality standard for sulfate in Kansas is 250ug/L.

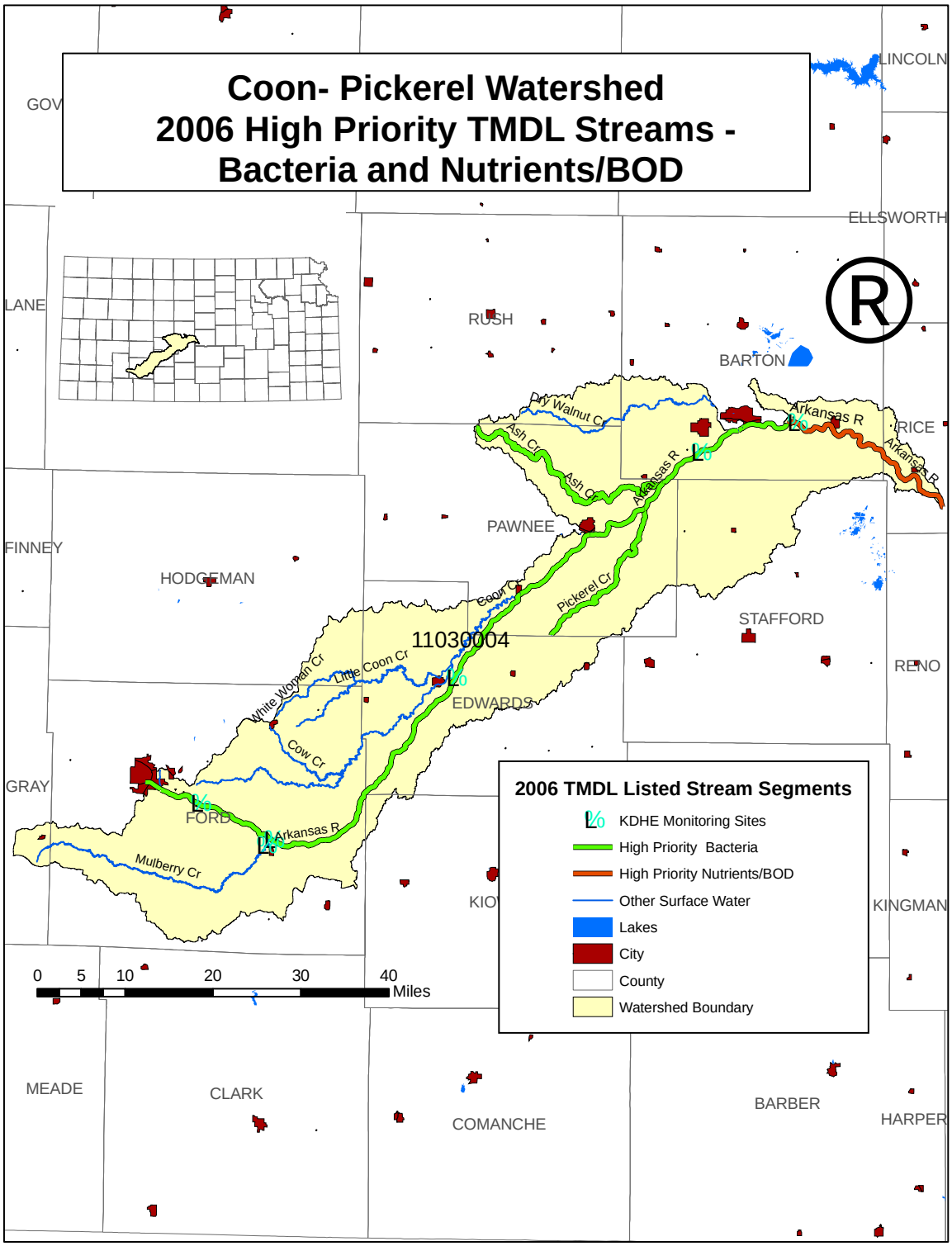
Fluoride: Fluoride is an inorganic mineral present in geological structures with volcanic ash. Excessive amounts can be toxic to irrigated crops (> 1mg/L) or impair drinking water (> 2mg/L)

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.

Boron: A naturally occurring mineral that serves as a micronutrient for plants. Excessive amounts can be toxic to crops. Kansas water quality standards for boron are 0.75mg/L.

Selenium: A naturally occurring metal in marine shale that serves as a micronutrient. Excessive amounts impair aquatic life and bioaccumulation up the food chain occurs causing toxicity to birds, mammals, and humans. Kansas water quality standards are an average of 5ppb and a maximum of 20ppb.

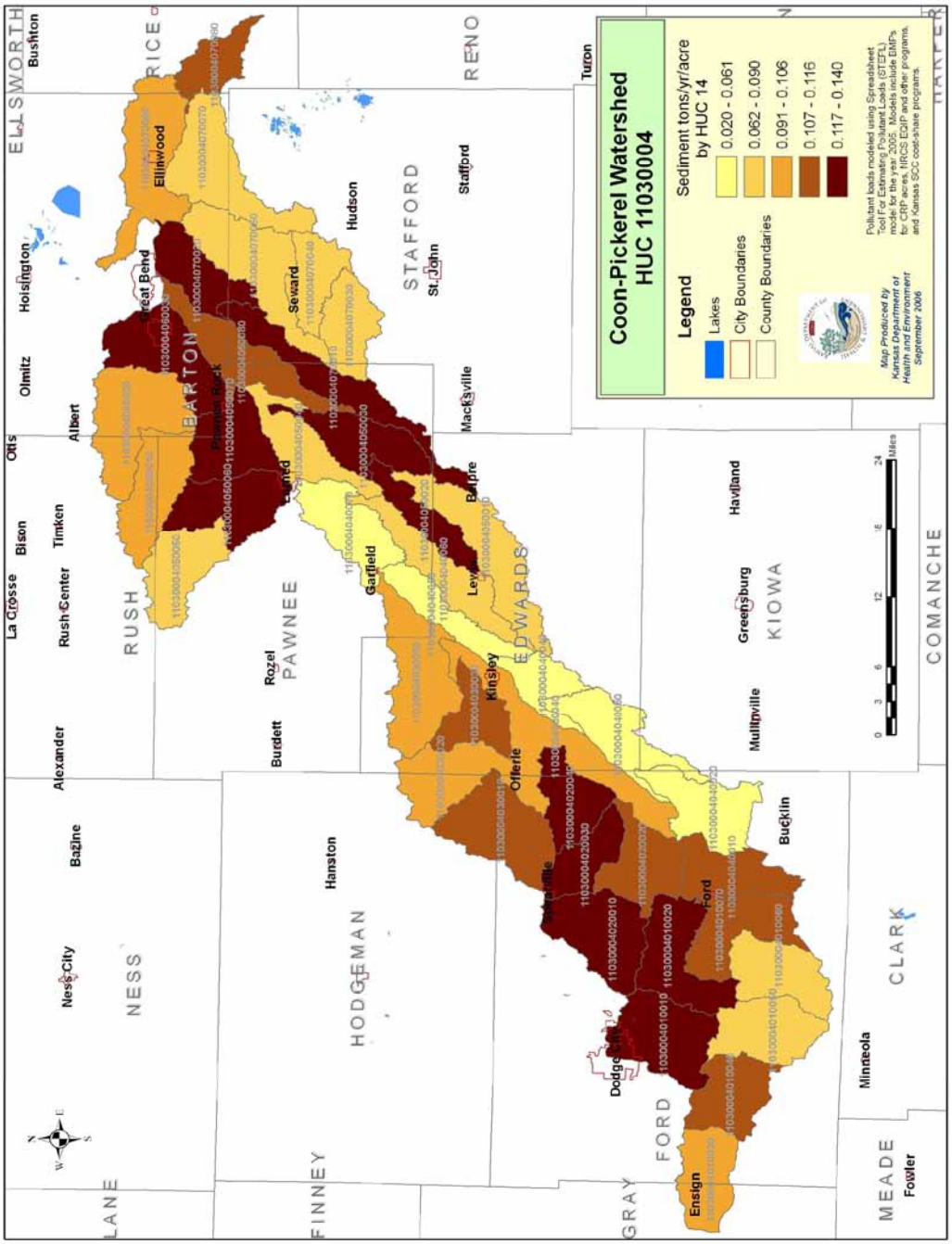
Dissolved Oxygen: Oxygen available to aquatic life with the water column. State water quality standards require a stream or lake to have at least 5mg/L of dissolved oxygen.


Coon- Pickerel Watershed
2006 High Priority TMDL Streams -
Bacteria and Nutrients/BOD
GOV
LINCOLN
ELLSWORTH
LANE
RUSH
BARTON
RICE
Dry Walnut Cr
Ash Cr
Arkansas R
PAWNEE
FINNEY
HODGEMAN
Coon Cr
Pickerel Cr
STAFFORD
11030004
Little Coon Cr
White Woman Cr
RENO
EDWARDS
Cow Cr
GRAY
FORD
Mulberry Cr
KIO
KINGMAN
MEADE
CLARK
COMANCHE
BARBER
HARPER
0 5 10 20 30 40 Miles
2006 TMDL Listed Stream Segments
KDHE Monitoring Sites
High Priority Bacteria
High Priority Nutrients/BOD
Other Surface Water
Lakes
City
County
Watershed Boundary

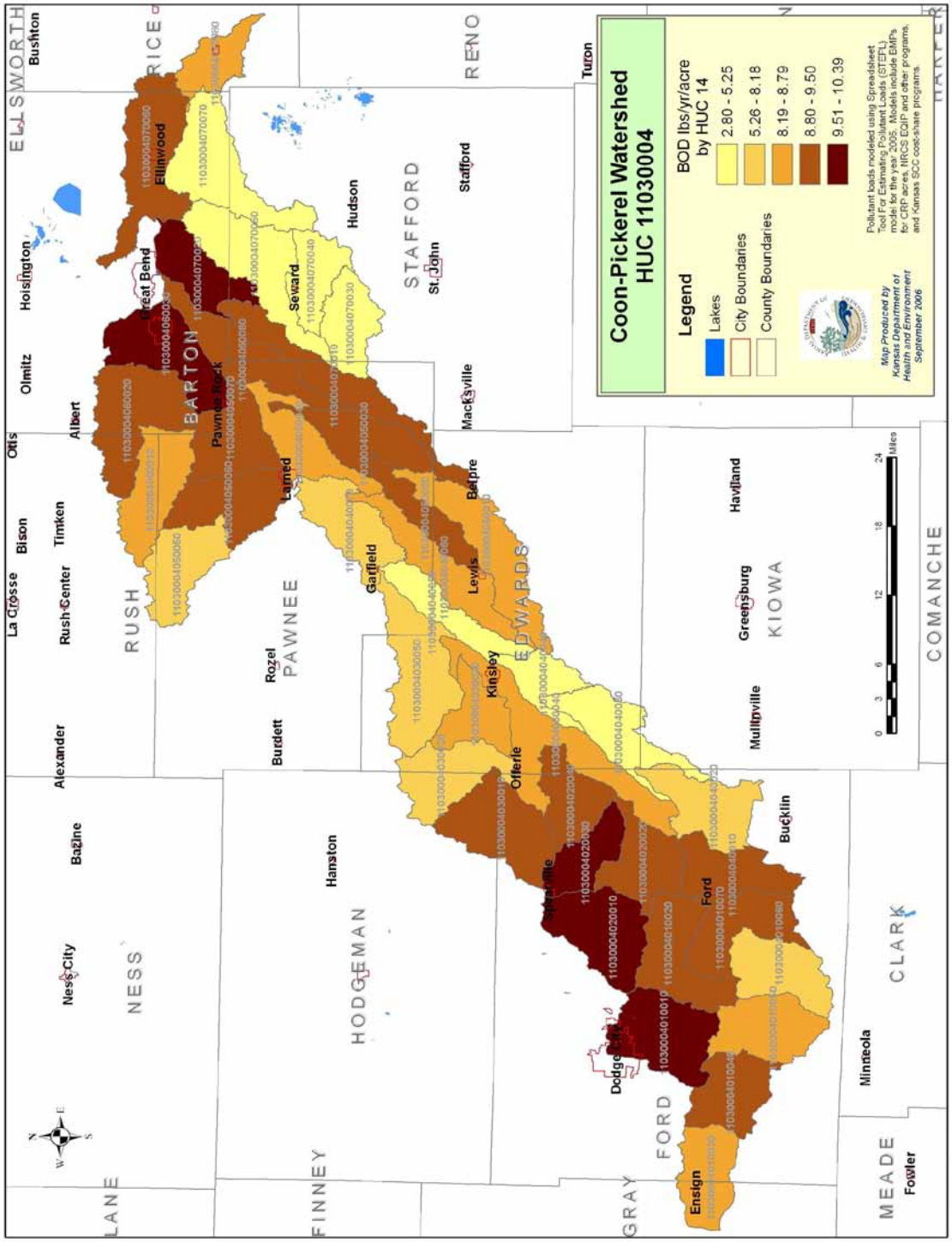
4.3.5 Modeled Pollutant Loads

The following figures indicate pollutant loads (sediment, BOD, 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 programs, and Kansas State Conservation Commission (SCC) cost-share programs.

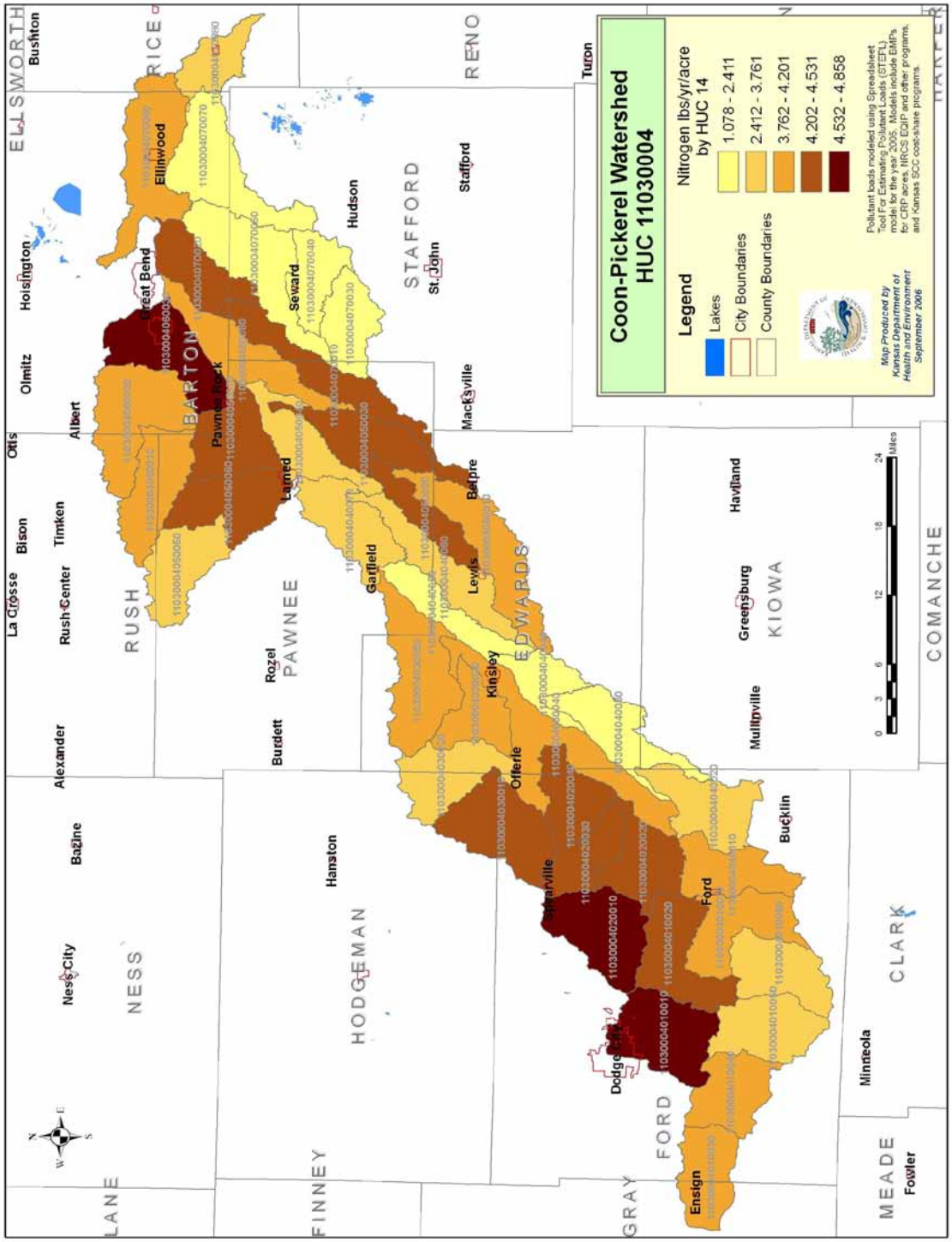
Sediment



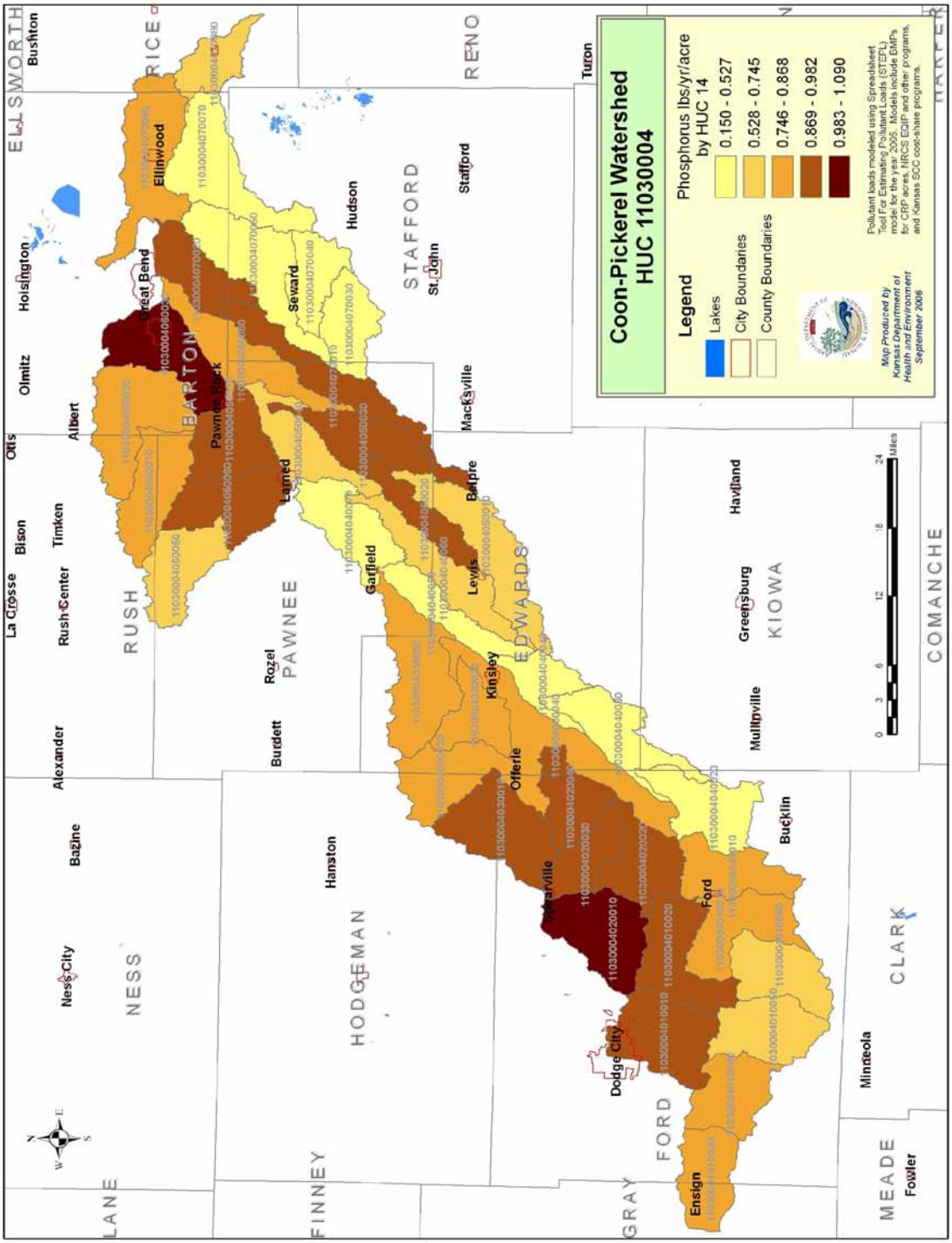
Biological Oxygen Demand (BOD)



Nitrogen


Coon-Pickerel Watershed
HUC 11030004
Legend
Lakes
City Boundaries
County Boundaries
Nitrogen lbs/yr/acre by HUC 14
1.078 - 2.411
2.412 - 3.761
3.762 - 4.201
4.202 - 4.531
4.532 - 4.858
Pollutant loads modeled using Spreadsheet Tool For Estimating Pollutant Loads (STEPL) model for the year 2005. Models include EMPs for CRP acres, NRCS EQIP and other programs, and Kansas SCC cost-share programs.
Map Produced by Kansas Department of Health and Environment September 2006
Miles
ELLSWORTH
RICE
RENO
STAFFORD
BARTON
RUSH
PAWNEE
EDWARDS
KIOWA
COMANCHE
NESS
HODGEMAN
FORD
CLARK
MEADE
FINNEY
GRAY
Bushton
Ellinwood
Great Bend
Hoisington
Olmitz
Albert
Otis
Bison
Timken
La Crosse
Rush Center
Alexander
Bazine
Ness City
Pawnee Rock
Larned
Seward
Hudson
St. John
Stafford
Turon
Macksville
Belpre
Garfield
Lewis
Rozel
Burdett
Kinsley
Offerle
Spearville
Ford
Dodge
Ensign
Hanston
Buckling
Minneola
Fowler
Greensburg
Haviland
Mullinville

Phosphorus

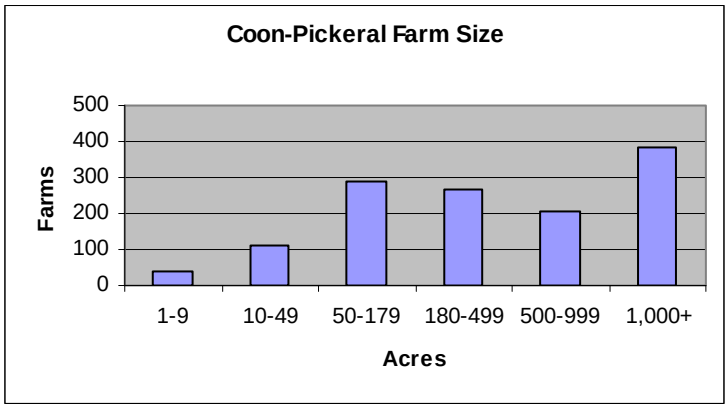

Coon-Pickerel Watershed
HUC 11030004
Legend
Lakes
City Boundaries
County Boundaries
Phosphorus lbs/yr/acre by HUC 14
0.150 - 0.527
0.528 - 0.745
0.746 - 0.868
0.869 - 0.982
0.983 - 1.090
Pollutant loads modeled using Spreadsheet Tool For Estimating Pollutant Loads (STEPL) model for the year 2005. Models include BMPs for CRP acres, NRCS EQIP and other programs, and Kansas SCC cost-share programs.
Map Produced by Kansas Department of Health and Environment September 2006
Miles
0 3 6 12 18 24
ELLSWORTH
RICE
RENO
HARPER
STAFFORD
BARTON
RUSH
PAWNEE
EDWARDS
KIOWA
COMANCHE
NESS
HODGEMAN
FORD
CLARK
LANE
FINNEY
GRAY
MEADE
Bushton
Ellinwood
Hoisington
Great Bend
Olmitz
Albert
Otis
Bison
Timken
La Crosse
Rush Center
Alexander
Bazine
Ness City
Seward
Hudson
Stafford
St. John
Turon
Pawnee Rock
Larned
Macksville
Belpre
Garfield
Lewis
Rozel
Burdett
Kinsley
Offerle
Greensburg
Haviland
Mullinville
Bucklin
Hanston
Jetmore
Ford
Dodge City
Minneola
Ensign
Fowler

4.4 Threatened and Endangered Species Status[18]

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 SPECIES			
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			
Arkansas Darter (*Etheostoma cragini*)	C/T		F/S
Arkansas River Shiner (*Notropis gerardi*)	T/E	Y	F/S
Speckled Chub (*Macrhybopsis aestivalis tetranemus*)	E	Y	S
Animals, Vertebrate - Birds			
Bald Eagle (*Haliaeetus leucocephalus*)	T/T		F/S
Eskimo Curlew (*Numenius borealis*)	E/E		F/S
Interior Least Tern (*Sterna antillarum athalassos*)	E/E	Y	F/S
Lesser Prairie Chicken (*Tympanuchus pallidicinctus*)	C		F
Peregrine Falcon (*Falco peregrinus*)	E		S
Piping Plover (*Charadrius melodus*)	T/T		F/S
Snowy Plover (*Charadrius alexandrinus*)	T	Y	S
Whooping Crane (*Grus Americana*)	E/E		F/S
White-faced Ibis (*Plegadis chihi*)	T	Y	S
Animals, Vertebrate – Mammal			
Black-footed Ferret (*Mustela nigripes*)	E/E		F/S
Eastern Spotted Skunk (*Spilogale putorius interrupta*)	T	Y	S
Animals, Vertebrate - Reptiles			
Texas Longnose Snake (Rhinocheilus lecontei tessellates)	T		S

5.0 Census and Social Data[19]



Number of Farms: 1290
- Average Farm Size: **1020**

Number of Operators: 1770
- Principle Full-Time Operators: **880**
- Principle Part-Time Operators: **410**

5.1 Estimated Level of Willingness and Ability to Participate in Conservation[10]

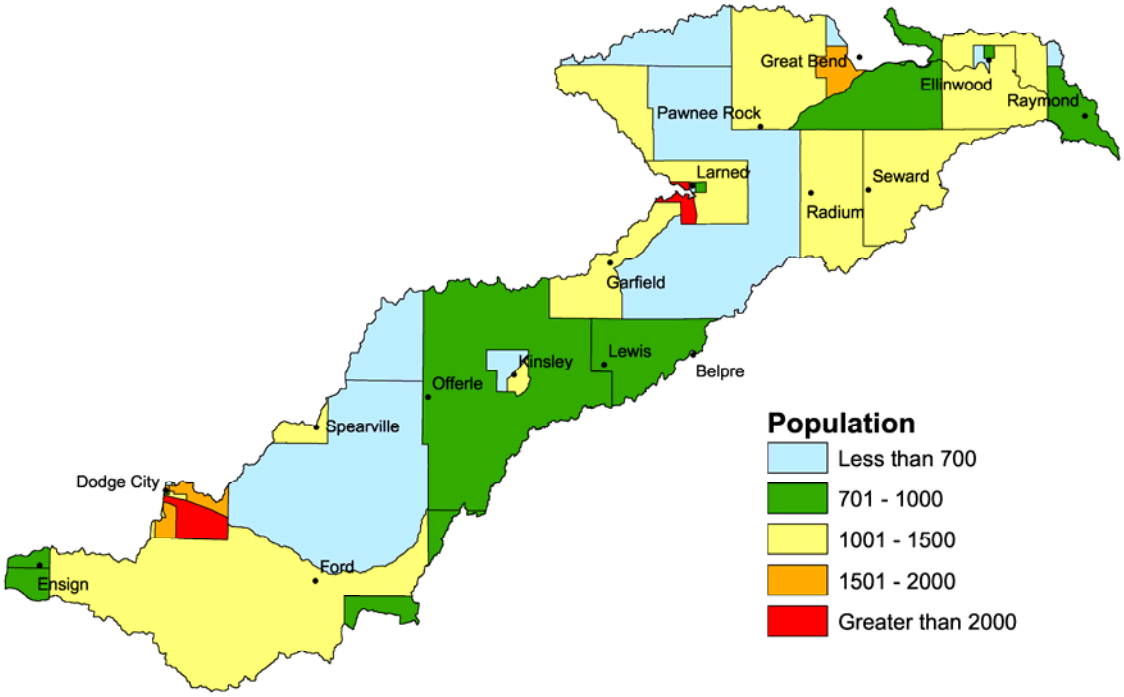
Many of the farmers in the Coon-Pickerel sub-basin are expanding their farm operations due to the number of retiring producers. Average producers are somewhat willing to consider innovative approaches to conservation, have a good knowledge of resource concerns, and are willing to assume some risk when adapting to climatic change or environmental fluxes. Participation in current farm programs varies from program to program, but is considered favorable. To increase the implementation of conservation throughout the sub-basin, resources need to be dedicated to marketing conservation and increasing conservation technical assistance for new and innovative approaches to conservation.

5.2 Evaluation of Social Capital[11]

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 Coon-Pickerel sub-basin are reported to be somewhat effective at solving problems. Some communities are very close knit and are willing to assist their neighbors by pooling their resources. Extremely dry conditions over the past decade have left the community with less economic capital, leading to a decreased state of social well-being and thus less likely to address resource concerns. Aquifer overdraft from crop irrigation and range producers is continuing to be a real issue that needs to be addressed by innovative conservation practices and the local communities. Opportunities for current farm operations are available to farm more and more acres of land within the sub-basin because of the lack of returning producers available to take over family farms.

5.3 Population Distribution Map (2000)



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 information (PRS), visit http://ias.sc.egov.usda.gov/prsreport2006/.

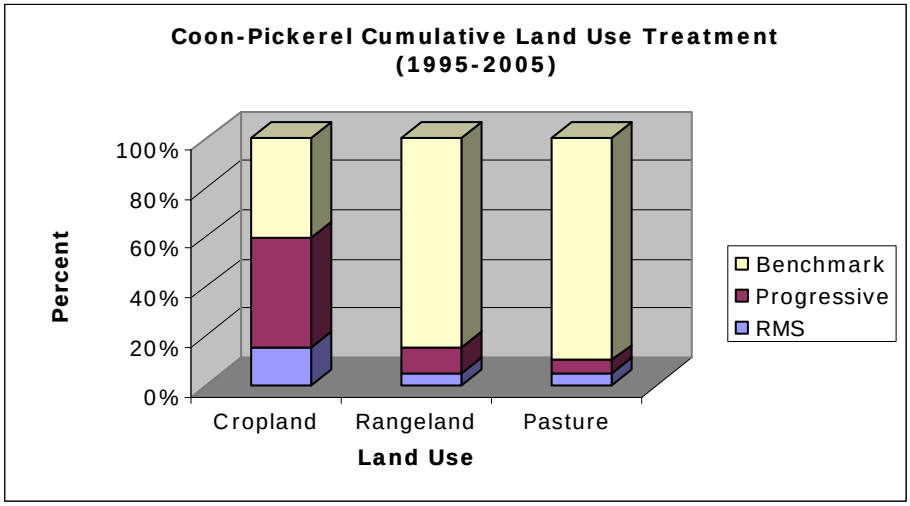
6.1 Reported Conservation Progress (2002 – 2006)

PRS Data	FY02	FY03	FY04	FY05	FY06	Avg/Year	Total
Total Conservation Systems Planned (ac)	38,938	19,185	N/A	29,275	29,822	29,305	117,220
Total Conservation Systems Applied (ac)	30,072	27,615	N/A	17,588	15,994	22,817	91,269
Conservation Treatment (Units/Acres)							
Brush Management (ac)				505	219	362	724
Comprehensive Nutrient Mgt. Plan (no)	5	12		1		6	18
Conservation Crop Rotation (ac)			7,831	4,187	4,652	5,557	16,670
Contour Farming (ac)			834	1,882	1,156	1,291	3,872
Cover Crop (ac)			2,437	1,370	1,289	1,699	5,096
Critical Area Planting (ac)			68	75	5	49	148
Cross Wind Trap Strips (ac)	68	39		20		42	127
Diversion (ft)			11,238	12,401	11,145	11,595	34,784
Fence (ft)				3,313		3,313	3,313
Field Border (ft)	37,996	65,244		5,150		36,130	108,390
Filter Strip (ac)	4,651	4,202	13			2,955	8,866
Forage Harvest Management (ac)			135	475		305	610
Grade Stabilization Structure (no)				14		14	14
Grassed Waterway (ac)	3,079	2,251	19	9	4	1,072	5,362
Irrigation System, Sprinkler (ac)			10			10	10
Irrigation Water Conveyance,Underground(ft)	38,757	29,560	2,032			23,450	70,349
Irrigation Water Management (ac)	40,244	31,911	812	523	90	14,716	73,580
Nutrient Management (ac)	15,093	9,552	513	306		6,366	25,464
Pasture and Hay Planting (ac)			31	10		21	41
Pest Management (ac)	269,419	190,973	2,792	5,759	1,198	94,028	470,141
Pipeline (ft)			11,226	18,340	4,882	11,483	34,448
Prescribed Grazing (ac)	388,066	294,978	1,883	1011	7,113	139,611	693,051
Range Planting (ac)			108	16	146	90	270
Residue Management, Mulch Till (ac)	118,063	59,596	8,159	2,930	1,951	38,140	190,699
Residue Management, No-Till/Strip Till (ac)	73,388	77,692	4,199	2,895	736	31,782	158,910
Residue Management, Ridge Till (ac)	1,874	2,024	584			1,494	4,482
Residue Management, Seasonal (ac)			561	880	886	776	2,327
Restoration and Mgt of Declining Habitats (ac)			115	79	228	141	422
Riparian Forest Buffer (ac)	427	445	14			295	886
Streambank Protection (Feet)	13,050	11,510				12,280	24,560
Terrace (ft)			178,488	138,987	84,452	133,976	401,927
Tree/Shrub Establishment (ac)	772	503	170		8	363	1,453
Underground Outlet (ft)				9,711		9,711	9,711
Upland Wildlife Habitat Management (ac)	359,490	199,871	2,364	3,538	1,061	113,265	566,324
Use Exclusion (ac)			1,862	3,694	1,199	2,252	6,755
Waste Storage Facility (no)	19	11		1		10	31
Waste Utilization (ac)			481	351		416	832
Water Well (no)			5	4	1	3	10
Watering Facility (no)			7	2	1	3	10
Wetland Restoration (ac)	1,146	717	38	140		510	2,041
Wetland Wildlife Habitat Management (ac)	5,803	1,658	38	100		1,900	7,599

Windbreak/Shelterbelt Establishment (ft)	502,344	395,500	18,082	9,540	4,450	185,983	929,916

6.2 Cumulative Conservation Status

Conservation plans developed and applied from 1995 to 2005 are projected in the following graph.



- Progress over the last 10 years has been focused on:
  - ~ Nutrient, pest, and irrigation water management on cropland.
  - ~ Confined Animal Feeding Operations.
  - ~ Erosion control on cropland.
- Row crop (e.g., corn and sorghum) farmers often rely on crop consultants.
- Range producers typically have not worked with NRCS, creating an opportunity for assistance.
- Much of the grazed range, pasture, and hay land are at the benchmark level of conservation.

Note: Estimates are based on information received from local conservationists in the watershed. Benchmark refers to untreated lands within the watershed.

6.3 Other Watershed Projects

NRCS Watershed Plans, Studies, and Assessments [13]		***NRCS Watershed Projects*** [12]	
NAME	***STATUS***	***NAME***	***STATUS***
None	None	None	None
Watershed 319 Projects [14]			
Fecal Coliform Abatement in Southwest Kansas, Part II			
Gray County Farmstead Water Quality Initiative			
Groundwater Management Districts [15]			
Big Bend Groundwater Management District (District No. 5)			
Southwest Groundwater Management District (District No. 3)			

6.4 Lands Removed from Crop Production through Farm Bill Programs [16]

Conservation Reserve Program (CRP)[a]:	**82,716 acres**
Wetlands Restoration Program (WRP):	**204 acres**
Grassland Reserve Program (GRP):	**None**
Farm and Ranch Lands Protection Program (FRPP)	**None**

[a] Data from 2006 Farm Service Agency, Conservation Reserve Program information.

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. Irrigated Adjudicated Water Rights – Water Information and Management Analysis System (WIMAS); the Kansas Department of Agriculture, Division of Water Resources (DWR); and Kansas Geological Survey, http://hercules.kgs.ku.edu/geohydro/wimas/index.cfm. Only five counties were used in this analysis. The remaining five counties in the HUC did not have a significant number or no irrigated acres within the HUC-8 watershed. Only whole county data was used; no percentage of county information was developed.

7. Kansas Department of Health and Environment, Total Maximum Daily Loads Strategies, http://www.kdheks.gov/tmdl/.

8. 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.

9. 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.

10. 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.

Footnotes / Bibliography Continued

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11. 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.

12. Natural Resources Conservation Service, 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/.

13. Natural Resources Conservation Service, Watershed Plans, Studies, and Assessments completed, http://www.nrcs.usda.gov/programs/watershed/Surveys_Plng.html#Watershed%20Surveys%20and%20Plan.

14. Kansas Department of Health and Environment (KDHE), Bureau of Water, Watershed Management Section, http://www.kdheks.gov/nps/wraps/index.htm, a KDHE Watershed Conditions Report can be found online at http://www.kdheks.gov/nps/watershed_condition.htm. The KDHE, Watershed Management Section implements Section 319 of the Clean Water Act, coordinating programs designed to eliminate or minimize non-point source pollution. The section develops and reviews strategies, management plans, local environmental protection plans, and county environmental codes intended to control non-point source pollution.

15. Kansas Groundwater Management Districts (GMD) - In Kansas, local units of government, called groundwater management districts, provide water-use administration, planning, and information. Five groundwater management districts were created in the 1970s in the western and central parts of the state. The primary use of ground water in these areas is irrigation, although several districts also face issues of municipal supply. The districts are governed by local boards and have been instrumental in providing information and identifying research and regulatory needs within their boundaries. Kansas Geologic Survey maintains information on GMDs at: http://www.kgs.ku.edu/Hydro/gmd.html.

16. Estimated from 2005 Farm Service Agency records. Natural Resources Conservation Service, Kansas, Program Information is located at http://www.ks.nrcs.usda.gov/programs.

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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 land uses. Systems include benchmark and resource management. 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 that 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 EQIP, Wildlife Habitat Incentives Program (WHIP), and WRP. Other funding available for implementation includes various private, local, and state program funds.

This assessment provides estimates only that 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	700,600	539,462	161,138	700,600	Acres
Cropland Needing Treatment	357,306	275,126	82,180	357,306	Acres
Cropland Currently at RMS Level**	119,102	91,709	27,393	119,102	Acres
Cropland Currently at Progressive Level***	343,294	264,336	78,958	343,294	Acres
Cropland Currently at Untreated Level	118,942	183,417	51,564	234,981	Acres
Typical Cropland-Dryland Management Unit	160				

** 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				
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quantity	Quality, Surface	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).
BM1		Ac.	183,417			-3	-1	-3	-2	
	Conservation Cropping Rotation	Ac.	183,417							
	Conventional Tillage	Ac.	183,417							
BM2			264,336			0	-1	-2	-1	
	Conservation Cropping Rotation	Ac.	264,336							
	Residue Management	Ac.	264,336							
	Terrace	Ac.	52,867							
RMS3		Ac.	91,709			+1	0	0	+1	
	Conservation Cropping Rotation	Ac.	91,709							
	Conservation Tillage	Ac.	91,709							
	Nutrient Management	Ac.	91,709							
	Pest Management	Ac.	91,709							
	Terrace	Ac.	18,342							

Desired / Estimated Participation Rates

	Proposed Practice Change	Rate	Acres
	Cropland-Dryland Conservation System	60%	165,075
	Cropland-Irrigation Conservation System	60%	49,308
		Total	214,384

Estimates:
120,000 Acres needing terraces
275,126 Acres needing treatment
110,050 Acres are not expected to be treated

Coon-Pickerel - 11030004

September 2006

1.1.2 Future Conditions		Total	BM1	BM2	RMS1	RMS2	RMS3	RMS4	RMS5	RMS6			
	Crop - Dryland	539,462	113,071	169,607	99,045	11,555	126,374	6,603	3,302	9,905			
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 Quantity	Water Quality, Surface	EQIP	WHIP	WRP	Other
BM1		Ac.	113,071			-3	-1	-3	-2				
	Conservation Cropping Rotation	Ac.	113,071		$67,843								
	Residue Management	Ac.	113,071		$2,488								
BM2		Ac.	169,607			0	-1	-2	-1				
	Conservation Cropping Rotation	Ac.	169,607		$101,764								
	Residue Management	Ac.	169,607		$3,731								
	Terrace	Ac.	33,921		$4,029,859								
RMS1		Ac.	99,045			+1	+1	+1	+1				
	Conservation Cropping Rotation	Ac.	99,045	$594,271	$59,427								
	Residue Management	Ac.	99,045	$108,950	$2,179					X			
	Nutrient Management	Ac.	99,045	$792,362	$79,236					X			
	Pest Management	Ac.	99,045	$594,271	$59,427					X			
RMS2		Ac.	11,555			+3	+3	+2	+3				
	Conservation Cover Crop	Ac.	11,555	$173,329,141	$1,733,291					X	X		X
	Native Grass Seeding	Ac.	11,555	$577,764	$2,889					X	X		X
RMS3		Ac.	126,374			+3	+2	+2	+2				
	Conservation Cropping Rotation	Ac.	126,374	$758,246	$75,825								
	Conservation Tillage	Ac.	126,374	$1,137,369	$113,737					X			
	Nutrient Management	Ac.	126,374	$1,010,995	$101,099					X			
	Pest Management	Ac.	126,374	$758,246	$75,825					X			
	Terrace Restoration	Ft.	11,651,673	$10,486,506	$262,163								
	Terrace	Ft.	15,283,594	$13,755,235	$343,881					X			X
RMS4		Ac.	6,603			+2	+1	+1	+1				
	Conservation Cropping Rotation	Ac.	6,603	$39,618	$3,962								
	Residue Management	Ac.	6,603	$7,263	$145					X			
	Terrace Restoration	Ft.	608,796	$547,916	$13,698								
	Terrace	Ft.	798,562	$718,706	$17,968					X			X
RMS5		Ac.	3,302			+2	+2	+1	+1				
	Conservation Cropping Rotation	Ac.	3,302	$19,809	$1,981								
	Conservation Tillage	Ac.	3,302	$29,714	$2,971					X			
	Nutrient Management	Ac.	3,302	$26,412	$2,641					X			
	Pest Management	Ac.	3,302	$19,809	$1,981					X			
RMS6		Ac.	9,905			+2	+1	+1	+2				
	Conservation Cropping Rotation	Ac.	9,905	$59,427	$5,943								
	Residue Management	Ac.	9,905	$10,895	$218					X			
	Nutrient Management	Ac.	9,905	$79,236	$7,924					X			
	Pest Management	Ac.	9,905	$59,427	$5,943					X			
	Terrace Restoration	Ft.	913,194	$821,874	$20,547								
	Terrace	Ft.	1,197,843	$1,078,059	$26,951					X			X
	Total RMS Costs			**$207,421,522**	**$7,227,536**								

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)		$1,795,448
Operator Investment (25% Cost Share)	$51,855,380	
Federal Costs (75% Cost Share)	$155,566,141	
Total RMS Costs	**$207,421,522**	**$7,227,536**
Estimated Level of Participation	60%	
Total acres projected to be in RMS System	256,784	
Total Annual Crop Production Benefit	$2,146,491	
Beneficial Effects of Proposed RMS System		
Improves soil condition		
Increases soil organic matter		
Improves water quality by reducing erosion and sediment delivery to streams		

1.0 Cropland

1.2 Irrigated

1.2.1 Current Conditions	Cultivated / Non-Cultivated*	Dryland	Irrigated	Total	
Total Cropland	700,600	539,462	161,138	700,600	Acres
Cropland Needing Treatment	357,306	275,126	82,180	357,306	Acres
Cropland Currently at RMS Level**	119,102	91,709	27,393	119,102	Acres
Cropland Currently at Progressive Level***	343,294	264,336	78,958	343,294	Acres
Cropland Currently at Untreated Level	118,942	183,417	51,564	234,981	Acres
Typical Cropland-Dryland Management Unit	160				

** 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		Quantity		Costs		Effects			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quantity	Water Quality, Surface
BM1		Ac.	51,564			-3	-1	-3	-2
	Conservation Cropping Rotation	Ac.	51,564						
	Conventional Tillage	Ac.	51,564						
BM2			78,958			0	-1	0	-1
	Conservation Cropping Rotation	Ac.	78,958						
	Residue Management	Ac.	78,958						
	Irrigation Water Management	Ac.	78,958						
RMS1		Ac.	27,393			+2	0	+1	+1
	Conservation Cropping Rotation	Ac.	27,393						
	Conservation Tillage	Ac.	27,393						
	Nutrient Management	Ac.	27,393						
	Pest Management	Ac.	27,393						
	Irrigation Water Management	Ac.	27,393						

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).

Desired/Estimated Participation Rates

	Proposed Practice Change	Rate	Acres
	Cropland-Dryland Conservation System	60%	165,075
	Cropland-Irrigation Conservation System	60%	49,308
		Total	214,384

Estimates:

82,180 Acres needing treatment

32,872 Acres are not expected to be treated

1.2.2 Future Conditions		Total	BM1	BM2	RMS1	RMS2	RMS3	RMS4					
	Crop - Irrigated	161,138	44,732	67,098	43,391	986	493	4,438					
Future Conditions for Cropland - Irrigated													
Management Systems		Quantity		Costs		Effects				Implementation			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quantity	Water Quality, Surface	EQIP	WHIP	WRP	Other
BM1		Ac.	44,732			-3	-1	-3	-2				
	Conservation Cropping Rotation	Ac.	44,732		$26,839								
	Residue Management	Ac.	44,732		$984								
BM2		Ac.	67,098			0	-1	0	-1				
	Conservation Cropping Rotation	Ac.	67,098		$40,259								
	Residue Management	Ac.	67,098		$1,476								
	Irrigation Water Management	Ac.	67,098		$73,808								
RMS1		Ac.	70,785			+2	0	+1	+1				
	Conservation Cropping Rotation	Ac.	70,785	$424,708	$42,471					X			
	Residue Management	Ac.	70,785	$77,863	$1,557					X			
	Nutrient Management	Ac.	70,785	$566,278	$56,628					X			
	Pest Management	Ac.	70,785	$424,708	$42,471					X			
	Irrigation Water Management	Ac.	70,785	$778,632	$77,863					X			
RMS2		Ac.	986			+3	+3	+2	+3				
(convert to perm cover)	Cover and Green manure Crop	Ac.	986	$19,723	$1,972					X	X		X
	Pasture and Hay Planting	Ac.	986	$59,170	$592					X	X		X
RMS3		Ac.	493			+3	+2	+2	+2				
(convert to dryland)	Conservation Cropping Rotation	Ac.	493	$2,958	$296					X			
	Conservation Tillage	Ac.	493	$4,438	$444					X			
	Nutrient Management	Ac.	493	$3,945	$394					X			
	Pest Management	Ac.	493	$2,958	$296					X			
RMS4		Ac.	4,438			+2	+1	+1	+1				
(convert to low pressure)	Conservation Cropping Rotation	Ac.	4,438	$26,626	$2,663					X			
	Conservation Tillage	Ac.	4,438	$39,940	$3,994					X			
	Irrigation Water Management	Ft.	4,438	$48,815	$4,882					X			
	Irrigation System, Sprinkler (conversion)	Ft.	4,438	$252,951,210	$1,264,756					X			X
	Total RMS Costs			**$255,431,972**	**$1,644,644**								

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)		$233,958
Operator Investment (25% Cost Share)	$63,857,993	
Federal Costs (75% Cost Share)	$191,573,979	
Total RMS Costs	**$255,431,972**	**$1,644,644**
Estimated Level of Participation	60%	
Total acres projected to be in RMS System	49,308	
Total Annual Crop Production Benefit	$2,570,766	
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	220,000	0	220,000	Acres
Grazed Range Needing Treatment	130,000	0	130,000	
Total Range with Brush Invasion	40,000	0	40,000	Acres
Typical Range Management Unit	160			

** 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 Grazed Range

Grazed Range		Quantity		Costs		Effects			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Plant Condition	Water Storage	Habitat	WQ
BM1		Ac.	130,000			-3	-1	-3	-2
	Pond	No.	203						
	Watering Facility	No.	609						
	Fence	Mi.	1,625						
BM2		Ac.	90,000			0	+1	+1	+1
	Prescribed Grazing	Ac.	90,000						
	Pond	No.	141						
	Watering Facility	No.	563						
	Pipeline	Ft.	1,462,500						
	Fence	Mi.	1,125						

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).

Desired / Estimated Participation Rates

	Proposed Practice Change	Rate	Acres
	Grazing System	60%	78,000
	Brush Management	60%	24,000
	Prescribed Burning	60%	78,000

2.1.2 Future Conditions		Total	BM1	BM2	RMS
	Grazed Range	220,000	52,000	90,000	78,000

Future Conditions for Grazed Range

Grazed Range and Forestlands		Quantity		Costs		Effects				Implementation			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Plant Condition	Water Storage	Habitat	WQ	EQIP	WHIP	WRP	Other
BM1		Ac.	52,000			-3	-1	-3	-2				
	Pond	No.	81		$9,750								
	Watering Facility	No.	244		$11,213								
	Fence	Mi.	650		$137,280								
BM2		Ac.	90,000			0	+1	+1	+1				
	Prescribed Grazing	Ac.	90,000		$89,100								
	Pond	No.	141		$16,875								
	Watering Facility	No.	422		$19,406								
	Pipeline	Ft.	1,096,875		$19,744								
	Fence	Mi.	1,125		$237,600								
RMS		Ac.	78,000			+2	+2	+2	+2				
	Prescribed Grazing	Ac.	78,000	$234,000	$77,220					X			
	Fence	Mi.	488	$5,148,000	$20					X			X
	Brush Management	Ac.	24,000	$1,200,000	$36,000					X	X		
	Prescribed Burning	Ac.	78,000	$156,000	$156					X	X		
	Watering Facility	No.	366	$840,938	$16,819					X			X
	Pipeline	Ft.	950,625	$1,711,125	$17,111					X			X
	Pond	No.	122	$1,462,500	$14,625					X			X
	Streambank & Shoreline Protection	Ft.	21,000	$1,260,000	$25,200					X			
	Total RMS Costs			**$12,012,563**	**$728,118**								

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)		$77,376
Operator Investment (25% Cost Share)	$3,003,141	
Federal Costs (75% Cost Share)	$9,009,422	
Total RMS Costs	**$12,012,563**	**$728,118**
Estimated Level of Participation	60%	
Total acres projected to be in RMS System	78,000	
Total Annual Forage Production Benefits	$127,407	

Beneficial Effects of Proposed RMS System

- Improves plant condition, health and vigor
- Improves upland wildlife habitat for prairie chicken and other range dependant species
- Improves water quality by reducing erosion and sediment delivery to streams

3.0 Pasture

3.1 Non-irrigated Pasture

3.1.1 Current Conditions	Grazed	Ungrazed	Total	
Total Pasture	14,000	0	14,000	Acres
Pasture Needing Treatment	13,720	0	13,720	
Typical Pasture 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 Non-Irrigated Pasture

Pasture		Quantity		Costs		Effects			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Plant Condition	Water Storage	Habitat	WQ
BM1		Ac.	13,720			-3	-1	-3	-2
	Pond	No.	21						
	Watering Facility	No.	154						
	Fence	Mi.	263						
BM2		Ac.	280			-1	+1	+1	+1
	Prescribed Grazing	Ac.	280						
	Pond	No.	0						
	Watering Facility	No.	3						
	Pipeline	Ft.	3,981						
	Fence	Mi.	5						

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).

Desired/Estimated Participation Rates

	Proposed Practice Change	Rate	Acres
	Pasture System	60%	8,232

3.1.2 Future Conditions	Total	BM1	BM2	RMS
Pasture	14,000	5,488	280	8,232

Future Conditions for Non-Irrigated Pasture

Pasture		Quantity		Costs		Effects				Implementation			
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Plant Condition	Water Storage	Habitat	WQ	EQIP	WHIP	WRP	Other
BM1		Ac.	5,488			-3	-1	-3	-2				
	Pond	No.	9		$1,029								
	Water Facility	No.	26		$3,087								
	Fence	Mi.	69		$14,488								
BM2		Ac.	280			-1	+1	+1	+1				
	Prescribed Grazing	Ac.	280		$277								
	Pond	No.	0		$53								
	Water Facility	No.	1		$158								
	Pipeline	Ft.	3,413		$61								
	Fence	Mi.	4		$739								
RMS		Ac.	8,232			+1	+2	0	+1				
	Prescribed Grazing	Ac.	8,232	$24,696	$8,150					X			
	Fence	Mi.	51	$543,312	$10,866					X			X
	Nutrient Management	Ac.	8,232	$65,856	$6,586					X			
	Pest Management	Ac.	8,232	$49,392	$4,939					X			
	Water Facility	No.	51	$308,700	$6,174					X			X
	Pipeline	Ft.	133,770	$240,786	$2,408					X			X
	Total RMS Costs			**$1,232,742**	**$59,015**								

3.1.3 Potential RMS Effects Summary for Non-Irrigated Pasture

Cost Items and Programs	Costs	O&M Costs
Potential Farm Bill Programs		
Annual Management Incentives (3 yrs - Incentive Payments)		$19,674
Operator Investment (25% Cost Share)	$308,186	
Federal Costs (75% Cost Share)	$924,557	
Total RMS Costs	**$1,232,742**	**$59,015**
Estimated Level of Participation	60%	
Total acres projected to be in RMS System	8,232	
Total Annual Forage Production Benefits	$12,918	

Beneficial Effects of Proposed RMS System

Improves plant condition, health and vigor

Improves water quality by reducing erosion and sediment delivery to streams