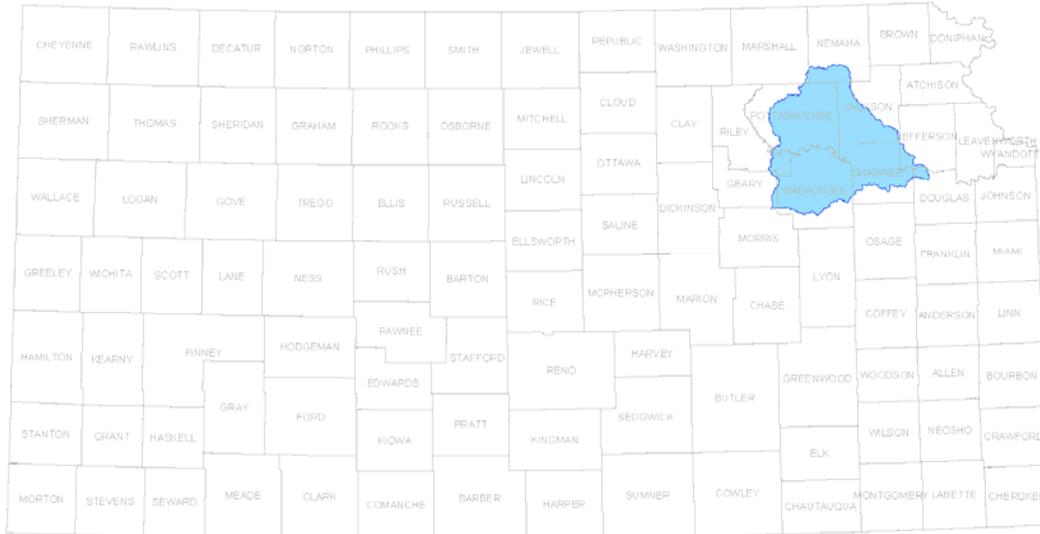


KANSAS

Rapid Watershed Assessment

Middle Kansas Watershed Hydrologic Unit Code – 10270102



December 2006

Produced by:

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

2.0 Introduction

The Middle Kansas 8-Digit Hydrologic Unit Code (HUC) sub-basin is comprised of 1,395,582 acres in north central Kansas and includes the counties of Marshall, Nemaha, Pottawatomie, Jackson, Geary, Riley, Wabaunsee, Shawnee, Jefferson, and Douglas. According to the National Land Cover Data (NLCD), approximately 28 percent of the sub-basin is in grain and row crop; 61 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 Middle Kansas Watershed Basin and drains into the Kansas River as it flows from west to east through the city of Topeka.

Relief Map



Resource concerns are numerous in the sub-basin. They include, but are not limited to, soil erosion, soil condition, deteriorated surface water quality, deteriorating plant conditions, and erosion in developing urban areas. Economic issues such as the high capital costs of crop production and farm operation, and the high level of management required to operate the farm may delay the acceptance and implementation of conservation on agricultural lands in the sub-basin.

It is estimated that there are 823 farms and 822 operators in the Middle Kansas sub-basin. The estimated farm size in 2002 was 436 acres, down from 440 acres from the 1987 estimate.

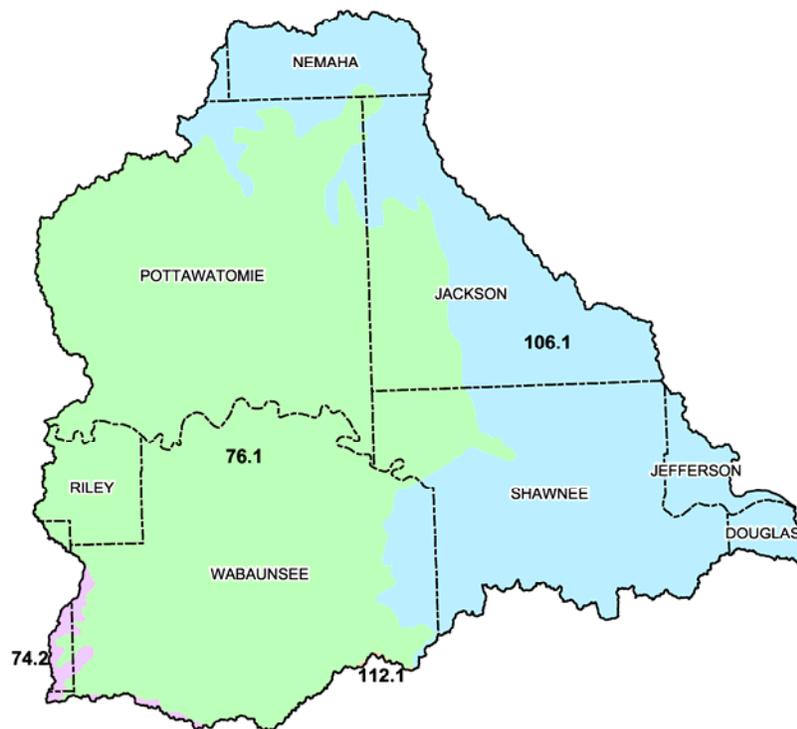
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Ten Natural Resources Conservation Service (NRCS) service centers, ten county conservation districts, the Cross Creek Watershed District, and the Glacial Hills and the Flint Hills Resource Conservation and Development (RC&D) areas provide conservation assistance in the sub-basin.

3.0 Physical Description

The physical description of the Middle Kansas 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 Map⁴



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.

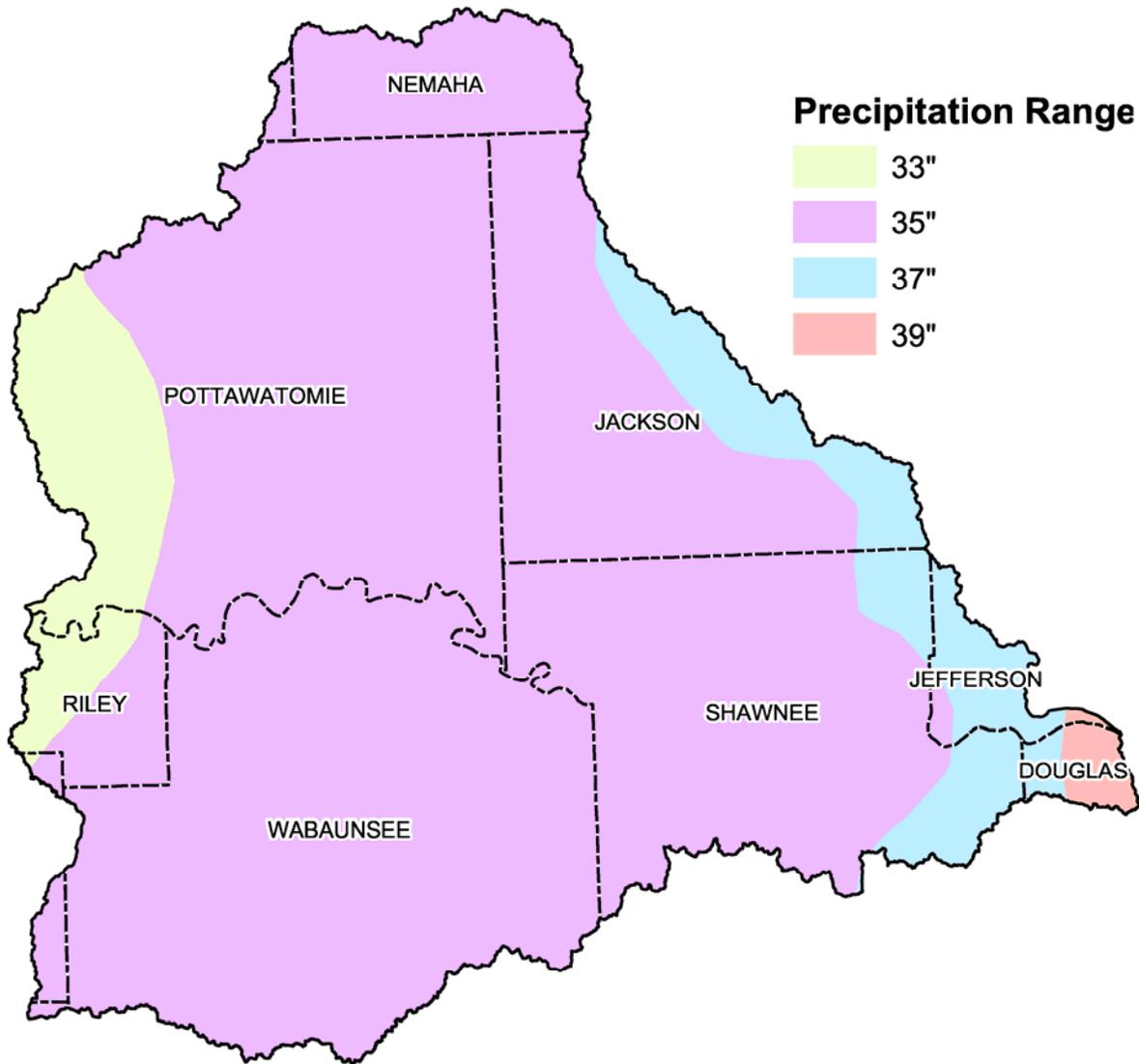
76.1 – Bluestem Hills: The Bluestem Hills CRA is a rolling plain interrupted by high, ragged escarpments in which limestone bedrock is regularly exposed. Local relief reaches 250 feet in the escarpment zones. Valley bottoms are narrow with steep sided slopes. Geologic parent materials are mainly thin-bedded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

106.1 – Nebraska and Kansas Loess Drift Hills: The Nebraska and Kansas Loess Drift Hills is a dissected glacial drift plain mantled by thick loess. The nearly level to strongly sloping ridge-tops are broad and smooth. The stream valleys are narrow with steep side-slopes. Local relief reaches to 200 feet. Soils are deep with high clay content. Pre-settlement vegetation was native tall grasses on the hills and trees along the streams and intermittent drainage-ways.

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3.2 Precipitation Map²

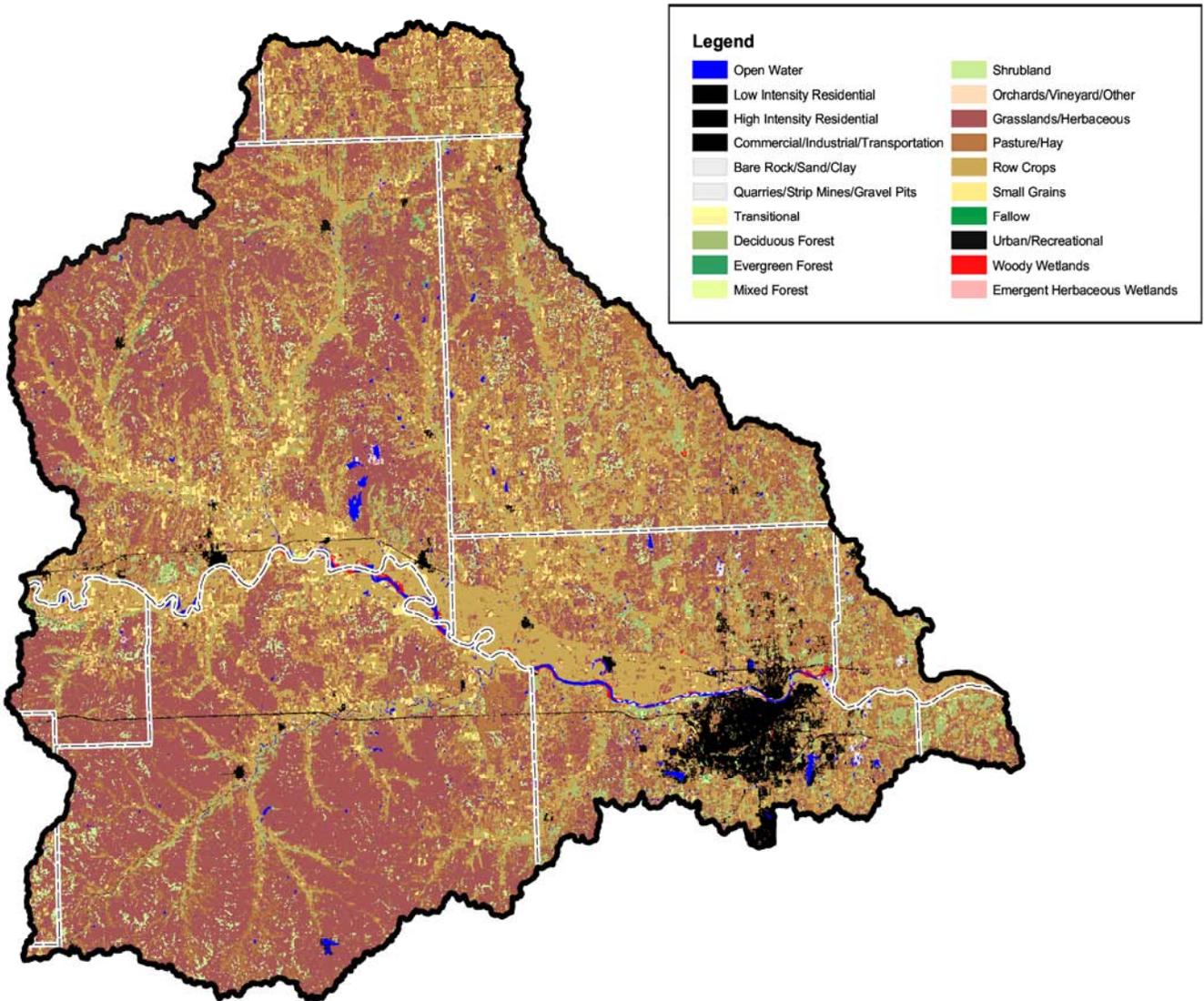
The map below depicts the average precipitation occurring within the sub-basin.



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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 | | | | | | | |
|--|--------------|----------|------------------|-------------|--------------|----------|------------------|-------------|
| | Public | | Private | | Tribal | | Totals | |
| | Acres | % | Acres | % | Acres | % | Acres | % |
| Open Water | 130 | * | 18,162 | 1 | 178 | * | 18,470 | 1 |
| Low Intensity Residential | | | 7,326 | 1 | 1 | * | 7,327 | 1 |
| High Intensity Residential | | | 13,604 | 1 | | | 13,604 | 1 |
| Commercial/Industrial/ Transportation | | | 10,049 | 1 | 3 | * | 10,052 | 1 |
| Bare Rock/Sand/Clay | | | 756 | 0 | | | 756 | 0 |
| Quarries/Strip Mines/ Gravel Pits | | | 1,348 | 0 | | | 1,348 | 0 |
| Deciduous Forest | | | 68,203 | 5 | 655 | * | 68,858 | 5 |
| Evergreen Forest | | | 648 | 0 | 5 | * | 653 | 0 |
| Mixed Forest | | | 2,521 | 0 | 21 | * | 2,542 | 0 |
| Shrubland | | | 30,555 | 2 | 584 | * | 31,139 | 2 |
| Grasslands/Herbaceous | 7295 | * | 530,050 | 38 | 1653 | * | 538,998 | 39 |
| Pasture/Hay | | | 305,462 | 22 | 1544 | * | 307,006 | 22 |
| Row Crops | | | 332,534 | 24 | 1039 | * | 333,573 | 24 |
| Small Grains | | | 48,699 | 4 | 356 | * | 49,055 | 4 |
| Urban/Recreational | | | 5,097 | 0 | 1 | * | 5,098 | 0 |
| Woody Wetlands | | | 3,113 | 0 | 7 | * | 3,120 | 0 |
| Emergent Herbaceous Wetlands | | | 3,641 | 0 | 343 | * | 3,984 | 0 |
| HUC Totals^a | 7,425 | * | 1,381,768 | 100% | 6,390 | * | 1,395,582 | 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:

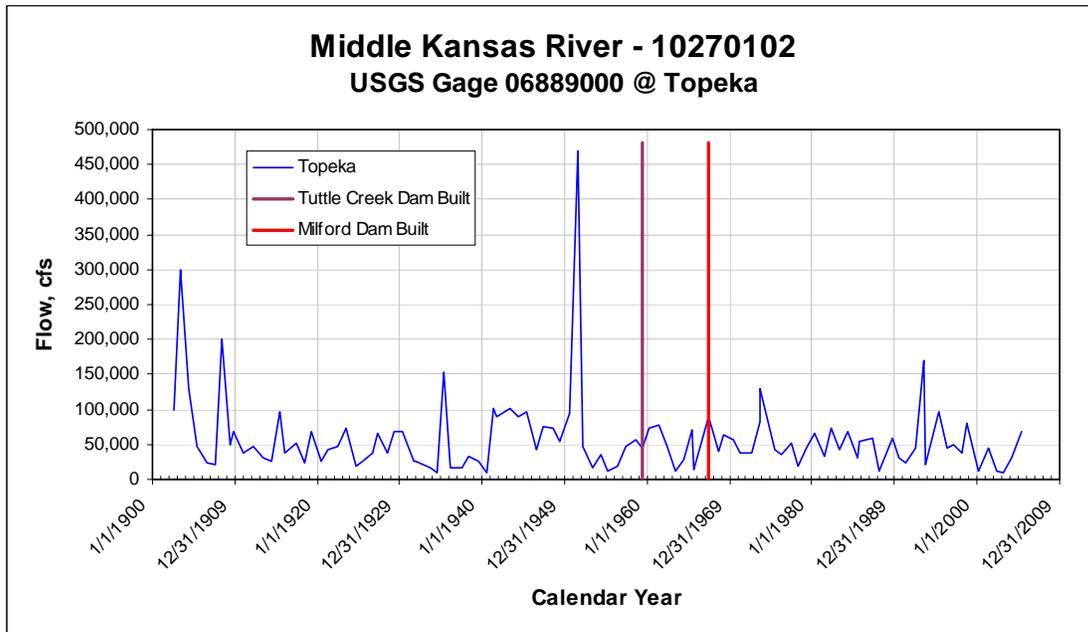
- Small grains and row crops are the predominant commodities grown in rotation on 28 percent of the watershed (approx. 382,628 acres).
- Grasslands/Herbaceous and Pasture/Hay make up approximately 61 percent of the watershed (approximately 846,004 acres).
- Forest makes up approximately 5 percent of the watershed (approximately 72,053 acres).
- Urban land comprises 3 percent of the watershed (approximately 36,081 acres).

| Irrigated Lands ⁴ | Percent of Cropland | Percent of HUC |
|------------------------------|---------------------|----------------|
| | <5% | <2% |

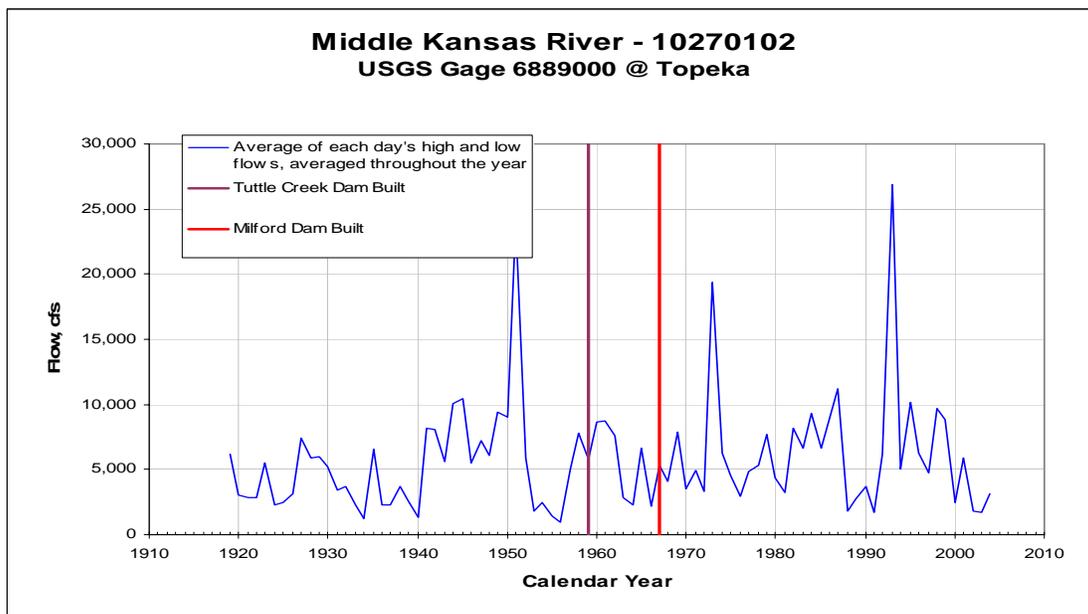
3.4 Stream Flow Data¹⁵

Stream flow data has been collected since the early 1900s. There are eight known U. S. Geological Survey (USGS) stream gage stations located within the sub-basin. For this assessment, data was collected from one stream gage station on the Kansas River near Topeka, Kansas.

Annual Peak Flow



Average Annual Discharge



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3.5 Other Physical Descriptions

| Stream Data ^{/6} | Total Miles of Streams in HUC Major (100K Hydro Geographic Information System [GIS] Layer) | 495 | |
|---|---|------------------|----------------|
| | | ACRES | PERCENT |
| Land Cover/Use ^{/3} Based on a 100-foot stretch on both sides of all streams in the 100K Hydro GIS Layer | Bare Rock/Sand/Clay | 62 | 0 |
| | Commercial/Industrial/Transportation | 97 | 0 |
| | Deciduous Forest | 559 | 1 |
| | Emergent Herbaceous Wetlands | 953 | 2 |
| | Evergreen Forest | 30 | 0 |
| | Fallow | 36 | 0 |
| | Grasslands/Herbaceous | 32,121 | 52 |
| | High Intensity Residential | 42 | 0 |
| | Low Intensity Residential | 47 | 0 |
| | Mixed Forest | 0 | 0 |
| | Open Water | 339 | 1 |
| | Pasture/Hay | 4,665 | 9 |
| | Quarries/Strip Mines/Gravel Pits | 9 | 0 |
| | Row Crops | 5,798 | 9 |
| | Shrubland | 383 | 1 |
| | Small Grains | 16,072 | 26 |
| | Transitional | 0 | 0 |
| Urban/Recreational | 33 | 0 | |
| Woody Wetlands | 315 | 1 | |
| Total Acres of 100-foot Stream Buffers | 61,561 | 100% | |
| Land Capability Class ^{/4} | 1 – slight limitations | 764,400 | 55 |
| | 2 – moderate limitations | | |
| | 3 – severe limitations | | |
| | 4 – very severe limitations | | |
| | 5 – no erosion hazard, but other limitations | 562,700 | 40 |
| | 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 | | |
| | Total | 1,327,100 | 95% |

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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 Middle Kansas 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 | | | X | | | |
| | Road, Roadsides and Construction Sites | | | | | | | X |
| Soil Condition | Organic Matter Depletion | | X | X | | | | |
| | Rangeland Site Stability | | | | X | | | |
| | Compaction | | X | X | | | | |
| | Contaminants: Commercial Fertilizer - N | | X | X | | | | |
| | Contaminants: Commercial Fertilizer - P | | X | X | | | | |
| Water Quality, Surface | Harmful Levels of Pesticides | | X | X | | | | |
| | Excessive Nutrients and Organics | | X | X | | | | |
| Plant Condition | Productivity, Health and Vigor | | | | X | | | |
| | Noxious and Invasive Plants | X | | | X | | | |
| | Forage Quality and Palatability | | | | X | | | |
| Animal, Domestic | Inadequate Stock Water | | | | X | | | |
| Economic | High Capital/Financial Costs | | | X | | | | |
| | High Management Level Required | | | X | | | | |

Pasture/Hay

- Pastureland is commonly over-utilized, lacks needed fertility, affected by timing of grazing and invasive weeds.
- Classic gullies have been identified as a concern.
- Invasive/noxious species are present (e.g. *Serecia lespedeza*, Johnsongrass).

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.
- Over application of nutrients and organics has created surface water quality concerns.
- Sheet and rill and ephemeral gully erosion are concerns in part due to lack of residue and/or needed erosion control methods on cropland.

Grazed Range

- Pastureland is commonly over-utilized, affected by timing of grazing and invasive weeds; affecting productivity, health and vigor.
- Over-utilization of the resource has created classic gullies and rangeland site stability concerns.
- Inadequate water supply for livestock affects grazing distribution and health and condition of the animal.

Urban

- Urban areas lack needed erosion protection during and after construction activities occur.

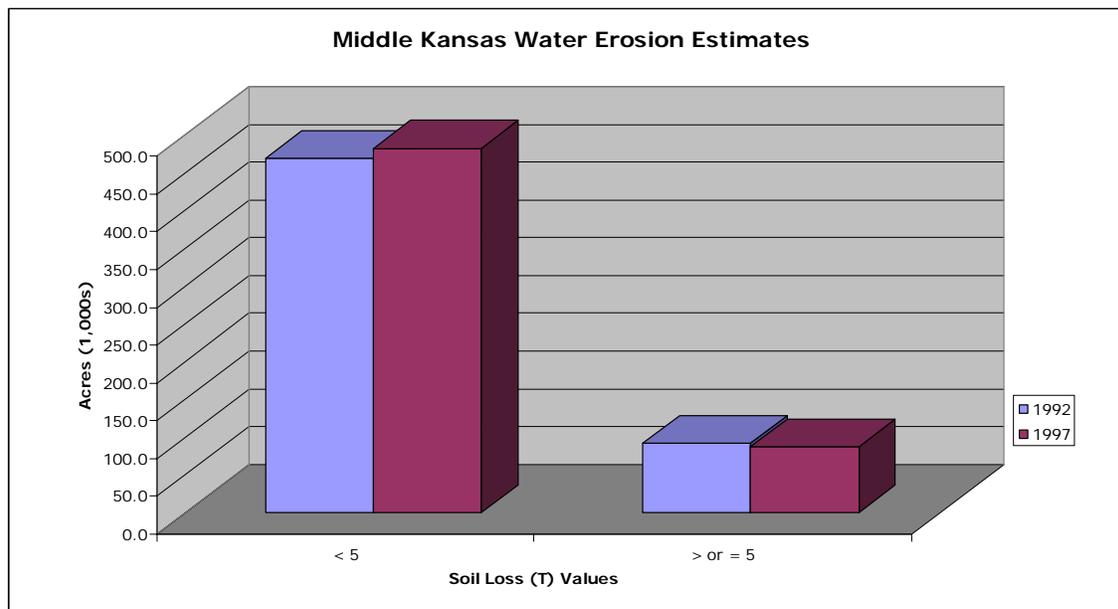
General

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

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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 has been identified as a concern in the watershed.



- Acres with soils eroding (by water) over 5 tons per acre per year have been reduced on approximately 4,000 acres of cropland and pasture from 1982 to 1997.
- Natural Resources Inventory (NRI) 1997 estimates indicate that 88,000 acres of the agricultural lands still had water erosion rates above a sustainable level.
- 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.

4.3 Water Quality Conditions^{/6 & /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 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.

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Confined Animal Feeding Operations Registry Table

| Animal/Operation Type | Dairy | Feedlot | Poultry | Swine | Truck Wash | Other |
|---|-------|---------|---------|--------|------------|-------|
| Number of Permitted Farms | 15 | 34 | 4 | 27 | 0 | 3 |
| Number of Permitted Animal Units | 1,552 | 25,460 | 0 | 13,041 | 0 | 525 |

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 109 Active Public Water Supply Sites located within this watershed. Though water is drawn from surface water within the watershed, much of the public water supply for the area is provided by two groundwater aquifers. Portions of the Glacial Drift aquifer exist in the northern portion of this watershed and are often used for rural domestic water supply. Alluvial aquifers of the Kansas 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 aquatic life use, primary and secondary contact recreation, domestic water supply, food procurement, industrial water supply, groundwater recharge, irrigation water supply, and livestock water supply.

| Designated Uses - Streams | | | | | | | | |
|---------------------------|------|------|----|----|----|----|----|----|
| Stream Name | AL | CR | DS | FP | GR | IW | IR | LW |
| Adams Creek | E | b | | X | | | | |
| Antelope Creek | E | C | | | | | | |
| Bartlett Creek | E | b | | | | | | |
| Big Elm Creek | E | b | | | | | | |
| Blackjack Creek | E | b | | | | | | |
| Blacksmith Creek | E | b | | | | | | |
| Bourbonais Creek | E | C | | X | | | | |
| Brush Creek | E | C | | | | | | |
| Coal Creek | E | b | | | | | | |
| Coryell Creek | E | b | | | | | | |
| Cow Creek | E | b | | | | | | |
| Cross Creek | E | C | | X | | | | |
| Darnells Creek | E | b | | | | | | |
| Deep Creek | E, S | C | X | X | X | X | X | X |
| Deep Creek, E Br | E | b | X | X | X | X | X | X |
| Deer Creek | E | C | X | X | X | X | X | X |
| Dog Creek | E | b | | | | | | |
| Doyle Creek | E | C | | | | | | |
| Dry Creek | E | C | | | | | | |
| Dutch Creek | E | b | | | | | | |
| Elm Creek | E | C, b | | | | | | |
| Elm Slough | E | b | | | | | | |
| Emmons Creek | E | b | | | | | | |
| French Creek | E | C | | | | | | |
| Gilson Creek | E | b | | | | | | |
| Halfday Creek | E | C | X | X | X | X | X | X |
| Hendricks Creek | E | C | | | | | | |
| Hise Creek | E | b | | | | | | |
| Illinois Creek | E, S | C, b | X | X | X | X | X | X |
| Indian Creek | E | b | X | X | X | X | X | X |
| James Creek | E | b | | | | | | |
| Jim Creek | E | b | | | | | | |
| Johnson Creek | E | b | | | | | | |
| Kansas R | S | B | X | X | X | X | X | X |
| Kuenzli Creek | E | b | | | | | | |
| Little Cross Creek | E | b | | | | | | |
| Little Muddy Creek | E | C | | | | | | |
| Little Soldier Creek | E | C, b | X | X | X | X | X | X |
| Loire Creek | E | C | | | | | | |
| Lost Creek | E | b | | | | | | |
| Messhoss Creek | E | C | | | | | | |
| Mill Creek | S | C | X | X | X | X | X | X |
| Mill Creek, E Br | S | C | X | X | X | X | X | X |
| Mill Creek, S Br | S | b | X | X | X | X | X | X |
| Mill Creek, W Br | E | C, b | X | X | X | X | X | X |

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| Stream Name | AL | CR | DS | FP | GR | IW | IR | LW |
|-------------------------|----|------|----|----|----|----|----|----|
| Mission Creek | E | C, B | X | X | X | X | X | X |
| Mission Creek, N Br | E | C | | | | | | |
| Mission Creek, S Br | E | b | X | | | | | |
| Mud Creek | E | b | | | | | | |
| Muddy Creek | E | C | | X | | | | |
| Muddy Creek, W Fk | E | b | | X | | | | |
| Mulberry Creek | E | b | | | | | | |
| Nehring Creek | E | C | | X | | | | |
| Paw Paw Creek | E | b | | | | | | |
| Pleasant Hill Run | E | C | | X | | | | |
| Pomeroy Creek | E | b | | | | | | |
| Post Creek | E | b | | | | | | |
| Pretty Creek | E | b | | | | | | |
| Riley Creek | E | C | | | | | | |
| Rock Creek | E | C | | X | | | | |
| Rock Creek, E Fk | E | b | | X | | | | |
| Ross Creek | E | b | | | | | | |
| Salt Creek | E | b | | | | | | |
| Sand Creek | E | b | | | | | | |
| Shunganunga Creek | E | C, B | X | X | X | X | X | X |
| Shunganunga Creek, S Br | E | B | X | X | X | X | X | X |
| Snake Creek | E | b | | | | | | |
| Snokomo Creek | E | b | | | | | | |
| Soldier Creek | E | C | X | X | X | X | X | X |
| Spring Creek | E | C, b | | | | | | |
| Stinson Creek | E | b | X | X | X | X | X | X |
| Sullivan Creek | E | C | | | | | | |
| Tecumseh Creek | E | b | X | X | X | X | X | X |
| Turkey Creek | E | C | | | | | | |
| Vassar Creek | E | b | | | | | | |
| Vermillion Creek | E | C, b | X | X | X | X | X | X |
| Walnut Creek | E | b | | X | | | | |
| Wells Creek | E | b | | | | | | |
| Whetstone Creek | E | b | | | | | | |
| Wilson Creek | E | C | | | | | | |

AL = Aquatic Life Support
IW = Industrial Water Supply
FP = Food Procurement

GR = Groundwater Recharge
DS = Domestic Water Supply
LW = Livestock Water Supply

CR = Contact Recreation
IR = Irrigation Water Supply

E = Expected Aquatic Life Use Water
S = Special 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
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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According to the Kansas Surface Water Register, the most *common* designated uses for lakes and wetlands in this watershed include expected aquatic life use, primary contact recreation, and food procurement.

| Designated Uses - Lakes | | | | | | | | |
|---------------------------------------|----|----|----|----|----|----|----|----|
| LAKE NAME | AL | CR | DS | FP | GR | IW | IR | LW |
| Alma City Lake | E | B | X | X | | X | | X |
| Cedar Crest Lake | E | B | O | X | | O | O | O |
| Central Park Lake | E | B | O | X | | O | O | O |
| Dornwood Park Lake | E | a | O | O | | O | O | O |
| Gage Park Lake | E | B | | X | | | | |
| Jeffrey Energy Center W.A. | E | B | | X | | X | | |
| Lake Jivaro | E | A | | X | | | | |
| Lake Shawnee | E | A | | X | | | | |
| Lake Sherwood | E | A | | X | | | | |
| Myer's Lake | E | B | O | X | | O | O | O |
| Pillsbury Crossing W.A. | E | B | | X | | | | |
| Pottawatomie Co. SFL #1 | E | B | | X | | | | |
| Shawnee Co. SFL | E | B | | X | | | | |
| Topeka Public Golf Course Lake | E | B | O | O | | O | | O |
| Wabaunsee Co. Lake | E | A | X | X | | X | | |
| Wamego City Lake | E | B | O | X | | O | O | O |
| Warren Park Lake | E | a | O | O | | O | O | O |
| Washburn Rural Environmental Lab Lake | E | B | | X | | | | |

| | | |
|--|--|--|
| AL = Aquatic Life Support IW = Industrial Water Supply FP = Food Procurement | GR = Groundwater Recharge DS = Domestic Water Supply LW = Livestock Water Supply | CR = Contact Recreation R = Irrigation Water Supply |
| <p>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 a = Secondary 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</p> | | |

4.3.4 Total Maximum Daily Loads

Total Maximum Daily Load (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 10270102 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

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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>.

| | | |
|--------------------|--|------|
| Stream Data | Total Miles – Major (100K Hydro GIS Layer) | 1298 |
| | 303d/TMDL Listed Streams (DEQ) | 1173 |

| 2006 Impaired Waters with TMDLs | | | |
|---------------------------------|-----------------------------------|----------------------------------|--------------------------------|
| Stream Segment | Stream/Watershed/Lake with TMDL | Priority for TMDL Implementation | Impairments |
| 1,3,4 | Kansas River (below Topeka) | Medium | Bacteria, Biological |
| 24,25 | Kansas River (Wamego) | Medium | Bacteria |
| 10 | Kansas River (at Topeka) | High | Ammonia |
| 39,40 | Shunganunga Creek Watershed | High | Bacteria, Dissolved Oxygen |
| 15,16,17,18 | Lower Vermillion Creek Watershed | High | Bacteria |
| 10 | Kansas River (at Topeka) | Medium | Bacteria |
| 27,28,29 | Mill Creek (Maple Hill) Watershed | High | Bacteria |
| 9,9909 | Upper Soldier Creek | High | Biology, Sediment |
| | Gage Park Lake | Low | Eutrophication |
| | Central Park Lake | Low | Eutrophication |
| | Warren Park Lake | Low | Eutrophication, Aquatic Plants |
| | Wamego City Lake | Low | Eutrophication |
| | Myers Pond | Low | Eutrophication |

| 2006 Impaired Waters needing TMDLs | |
|------------------------------------|----------------------------------|
| Impaired Stream/Lake | Impairment |
| Kansas River above Topeka | Biological, Zinc |
| Kansas River at Wamego | Zinc |
| Halfday Creek | Biological |
| Mission Creek | Biological |
| Lower Vermillion Creek | Biological |
| Muddy Creek | Copper |
| Mission Creek | Copper |
| Shawnee Lake | Eutrophication |
| Lake Wabaunsee | Eutrophication |
| Pottawatomie County SFL #1 | Eutrophication, Dissolved Oxygen |

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.

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.

Ammonia: Ammonia is a chemical, which is toxic to fish and aquatic organisms. Sources of ammonia are livestock, septic tanks, fertilizer, and municipal and industrial waste. Conditions of high pH and temperature increase the toxicity of ammonia.

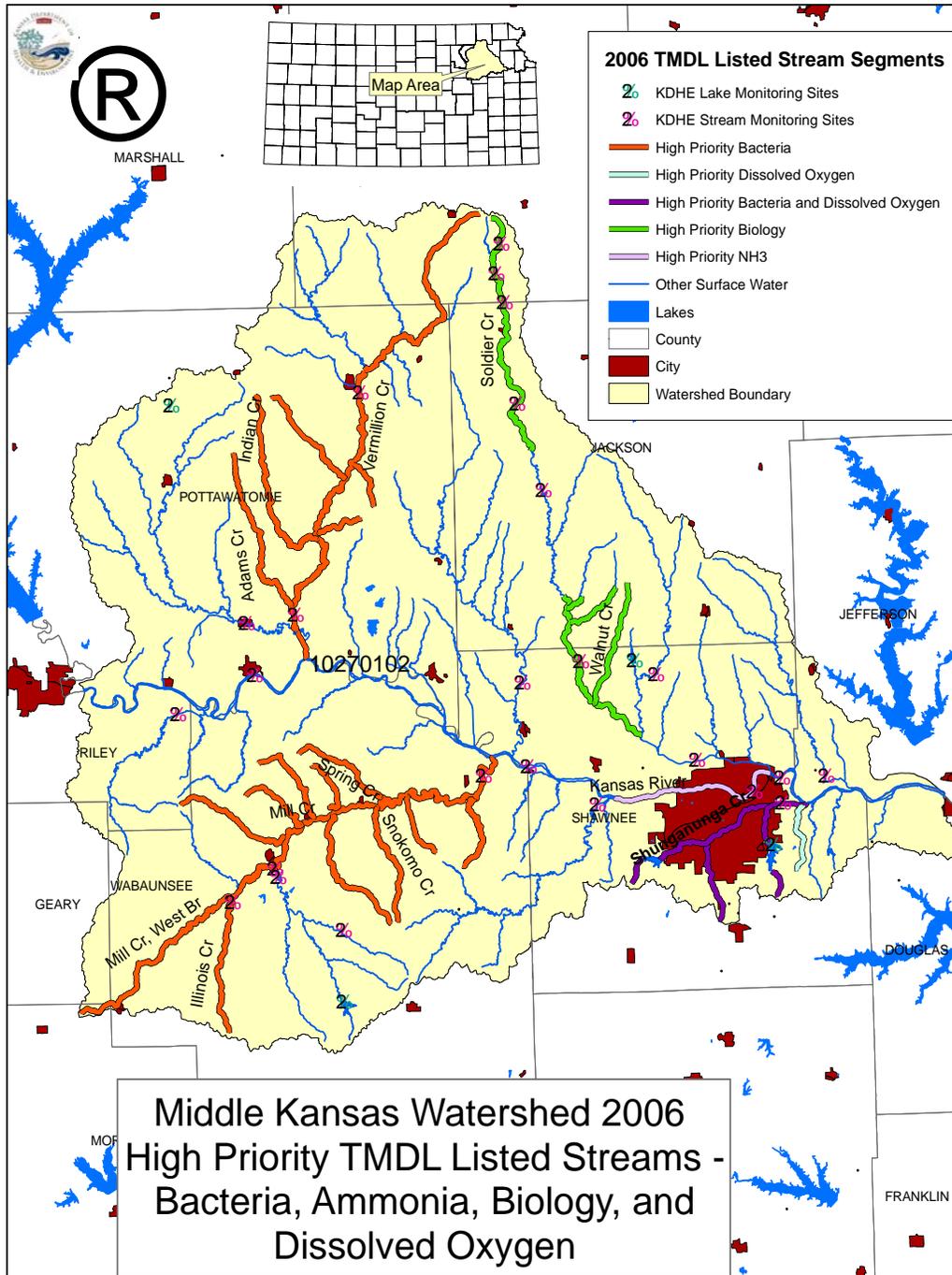
Dissolved Oxygen: Oxygen available to aquatic life with the water column. State water quality standards require a stream or lake to have at 5mg/L of dissolved oxygen.

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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.

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

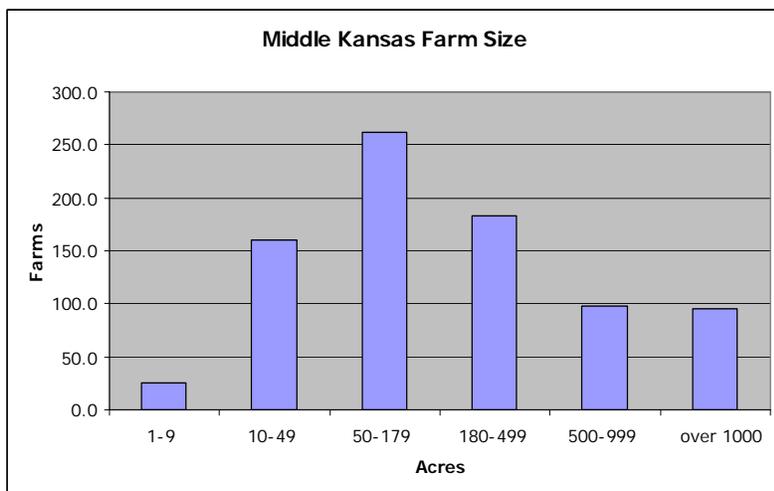


4.4 Threatened and Endangered Species Status⁴⁷

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 | | | |
| Chestnut Lamprey (<i>Ichthyomyzon castaneus</i>) | T | N | S |
| Flathead Chub (<i>Platygobio gracilis</i>) | T | Y | S |
| Hornyhead Chub (<i>Nocomis biguttatus</i>) | T | N | S |
| Pallid Sturgeon (<i>Scaphirhynchus albus</i>) | E/E | N | F/S |
| Sicklefin Chub (<i>Macrhybopsis meeki</i>) | C/E | N | F/S |
| Silver Chub (<i>Macrhybopsis storeriana</i>) | E | N | S |
| Sturgeon Chub (<i>Macrhybopsis gelida</i>) | C/T | Y | F/S |
| Topeka Shiner (<i>Notropis topeka</i>) | E/T | N | F/S |
| Western Silvery Minnow (<i>Hybognathus argyritis</i>) | T | N | 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 - Reptiles | | | |
| Redbelly Snake (<i>Storeria occipitomaculata</i>) | T | Y | S |
| Smooth Earth Snake (<i>Virginia valeriae</i>) | T | N | 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)⁴⁸



- Number of Farms: 823**
- Average Farm Size (ac.): **436**
- Number of Operators: 822**
- Full-Time Operators: **458**
- Part-Time Operators: **364**

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5.1 Estimated Level of Willingness and Ability to Participate in Conservation⁴⁹

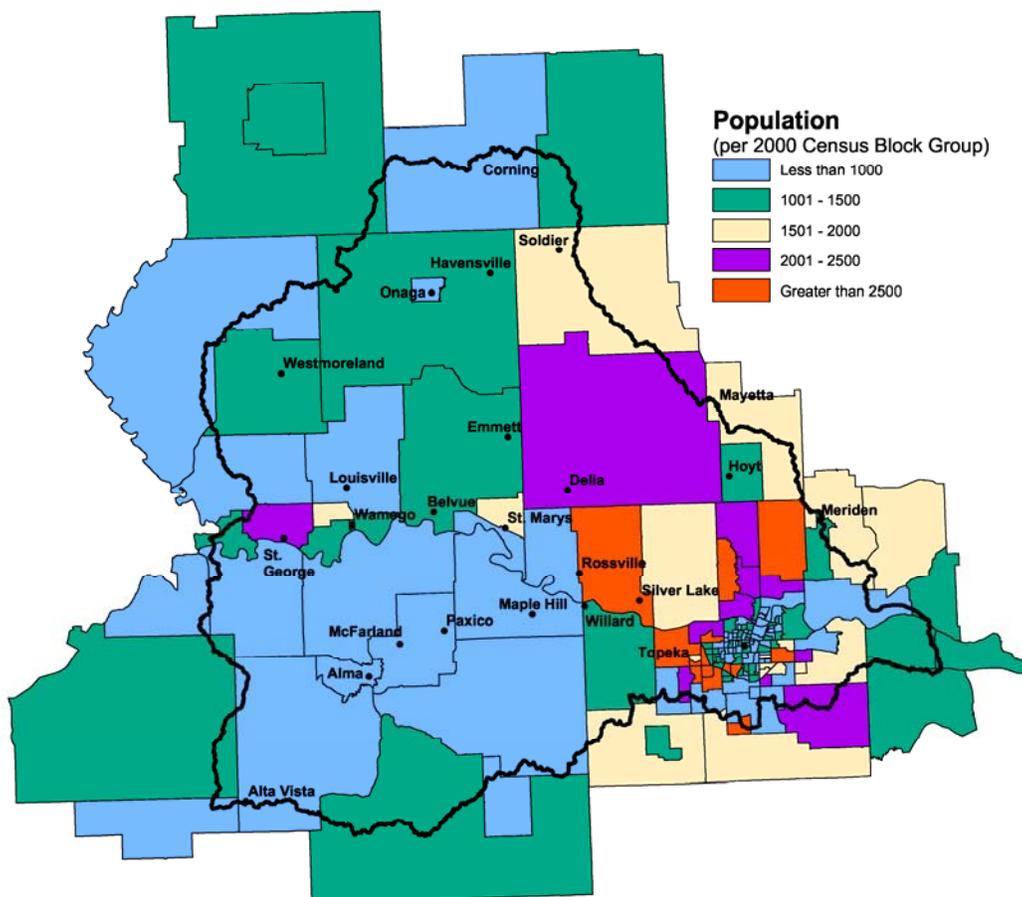
The Middle Kansas Watershed exhibits a good likelihood of full participation in the first five years of practice application, with moderate adjustments in technical and financial assistance and conservation marketing; although management skills and a combination of educational assistance and technical 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 delivery system may need minor modifications to improve effectiveness. Existing financial incentives need to be expanded or increased 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 Middle Kansas sub-basin are reported to be somewhat effective at solving problems. Some small communities are willing to assist their neighbors by pooling their resources to overcome adversity. Dry climatic conditions over the past decade have affected the community economic capital and led to a decreased state of social well-being, which decreases the community's ability to address local resource concerns.

5.3 Population Distribution Map (2000)



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6.0 Conservation Progress

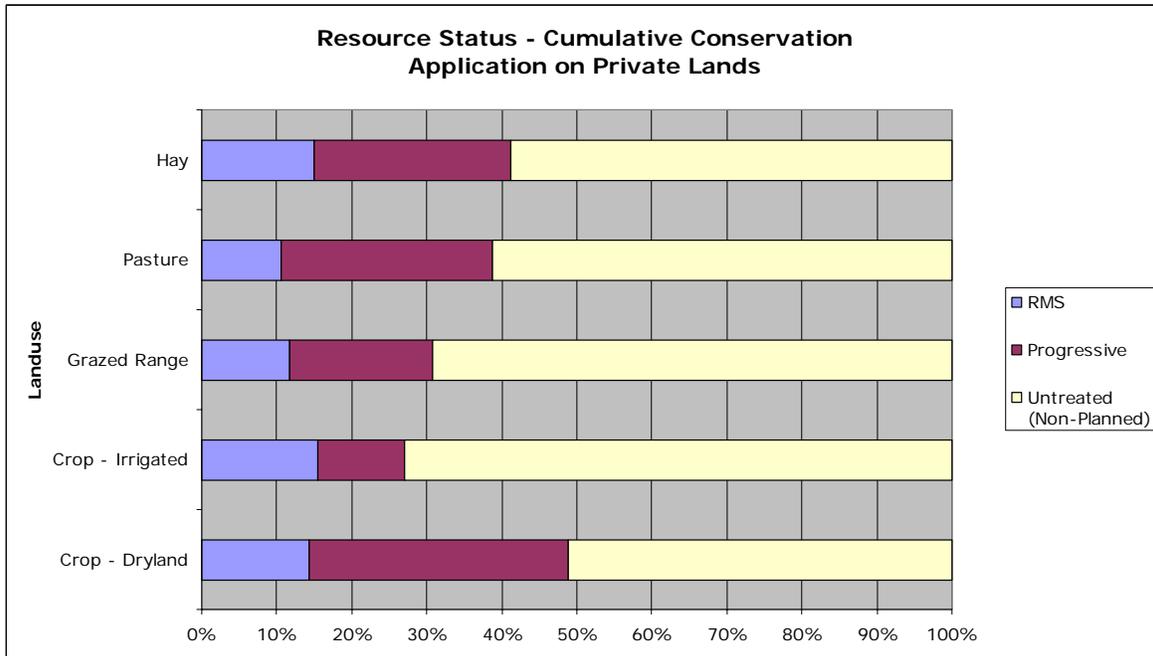
Conservation on the land is defined by the progress made by local landowners and operators addressing resource issues. Progress is typically accomplished through private, local, state, and federal funds. This data is current through the date the RWA was published. For up-to-date NRCS Performance Results 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) | 27,595 | 26,846 | N/A | 38,332 | 35,581 | 32,089 | 128,354 |
| Total Conservation Systems Applied (ac) | 23,961 | 17,307 | N/A | 24,289 | 32,879 | 24,609 | 98,436 |
| Conservation Treatment (Units/Acres) | | | | | | | |
| Brush Management (ac) | | | 3,217 | 6,270 | 7,145 | 5,544 | 16,632 |
| Comprehensive Nutrient Management Plan (no) | | | | | 1 | 1 | 1 |
| Conservation Crop Rotation (ac) | | | 1,880 | 2,626 | 2,323 | 2,276 | 6,829 |
| Contour Buffer Strips (ac) | 11 | | 13 | | | 12 | 24 |
| Contour Farming (ac) | | | 1,171 | 1,515 | 1,508 | 1,398 | 4,194 |
| Cover Crop (ac) | | | 92 | 89 | 44 | 75 | 225 |
| Critical Area Planting (ac) | | | 314 | 108 | 10 | 144 | 432 |
| Diversion (ft) | | | 811 | | 3,563 | 2,187 | 4,374 |
| Fence (ft) | | | 20,600 | 28,427 | 19,719 | 22,915 | 68,746 |
| Field Border (ft) | 20 | | | 1,800 | 26,214 | 9,345 | 28,034 |
| Filter Strip (ac) | 356 | 212 | 384 | 74 | 324 | 270 | 1,350 |
| Forage Harvest Management (ac) | | | 1,153 | 1,061 | 765 | 993 | 2,979 |
| Forest Stand Improvement (ac) | 10 | | | 16 | 34 | 20 | 60 |
| Grassed Waterway (ac) | 31 | 12 | 88 | 5 | 15 | 30 | 151 |
| Irrigation System, Sprinkler (ac) | | | 3 | 101 | 59 | 54 | 163 |
| Irrigation Water Management (ac) | | | 92 | 52 | 431 | 192 | 575 |
| Nutrient Management (ac) | 2,377 | 3,230 | 2,361 | 4,147 | 5,525 | 3,528 | 17,640 |
| Pasture and Hay Planting (ac) | | | 9 | 75 | 49 | 44 | 133 |
| Pest Management (ac) | 5,817 | 7,763 | 10,046 | 14,419 | 13,442 | 10,297 | 51,487 |
| Pipeline (ft) | | | 1,424 | 4,384 | 673 | 2,160 | 6,481 |
| Planned Grazing System (ac) | | | 828 | | | 828 | 828 |
| Pond (no) | | | 10 | 8 | 17 | 12 | 35 |
| Prescribed Burning (ac) | | | 4,082 | 4,012 | 3,675 | 3,923 | 11,769 |
| Prescribed Grazing (ac) | 2,792 | 7,211 | 10,097 | 8,710 | 14,085 | 12,671 | 42,895 |
| Range Planting (ac) | | | 258 | 337 | 956 | 517 | 1,551 |
| Residue Management, Mulch Till (ac) | 272 | 373 | 385 | 499 | 1,773 | 660 | 3,302 |
| Residue Management, No-Till/Strip Till (ac) | 536 | 686 | 208 | 2,002 | 2,125 | 1,111 | 5,557 |
| Residue Management, Ridge Till (ac) | | | 461 | | | 461 | 461 |
| Residue Management, Seasonal (ac) | | | 743 | 500 | 440 | 561 | 1,683 |
| Restoration/Management of Rare/Declining Habitats (ac) | | | 231 | 133 | 1,461 | 608 | 1,825 |
| Riparian Forest Buffer (ac) | 11 | 3 | 94 | | | 36 | 108 |
| Sediment Basin (no) | | | | | 34 | 34 | 34 |
| Spring Development (no) | | | 1 | 1 | 2 | 1 | 4 |
| Streambank and Shoreline Protection (ft) | 500 | | | 600 | | 550 | 1,100 |
| Terrace (ft) | | | 96,461 | 48,920 | 44,101 | 63,161 | 189,482 |
| Underground Outlet (ft) | | | 5,160 | 5,110 | 9,387 | 6,552 | 19,657 |
| Upland Wildlife Habitat Management (ac) | 5,725 | 3,660 | 8,717 | 9,894 | 12,141 | 8,027 | 40,137 |
| Use Exclusion (ac) | | | 1,581 | 2,379 | 3,605 | 2,522 | 7,565 |
| Waste Storage Facility (no) | | | | | 2 | 2 | 2 |
| Waste Utilization (ac) | | | | 57 | 211 | 134 | 268 |
| Water and Sediment Control Basin (no) | | | | 2 | | 2 | 2 |
| Watering Facility (no) | | | 2 | 8 | 6 | 5 | 16 |
| Wetland Restoration (ac) | | 61 | 67 | | | 64 | 128 |
| Wetland Wildlife Habitat Management (ac) | 1 | 61 | 1 | | | 21 | 63 |
| Windbreak/Shelterbelt Establishment (ft) | | | | 940 | | 940 | 940 |

6.2 Cumulative Conservation Status

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



- Progress over the last 10 years has been focused on:
 - ~ Nutrient and pest management on cropland.
 - ~ Confined Animal Feeding Operations.
 - ~ Erosion control on cropland.
- Range producers typically have not worked with NRCS, creating an opportunity for assistance.
- Much of the land uses listed remain untreated.

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

6.3 Other Watershed Projects

| <i>Watershed Projects, Plans, Studies, and Assessments</i> | | |
|--|---------------|--|
| <i>NRCS Watershed Projects</i> ¹¹ | | <i>Watershed Plans, Studies, and Assessments</i> ¹² |
| <i>Name</i> | <i>Status</i> | <i>Name</i> |
| Cross Creek Watershed Joint District No. 42 | Complete | Mill Creek Watershed Joint District No. 85 |
| | | Rock Creek Watershed Joint District No. 45 |
| <i>319 Projects, KDHE TMDL Plans</i> ⁶ , <i>Watershed Restoration and Protection Strategy Plans</i> ¹³ | | |
| Middle Kansas River Watershed Restoration and Protection Strategy (WRAPS) Development (Kansas Alliance for Wetlands and Streams) | | |
| Kansas River Valley Information and Education (Friends of the Kaw) | | |
| Topeka Water Festival (Kansas Association for Conservation and Environmental Education) | | |
| Lake Shawnee Watershed Protection Project (Shawnee County Conservation District) | | |
| Non-point Source Education for 4th Level "Wild World of Water" School Years 2000 through 2004 (Topeka USD 501 Public Schools) | | |
| Performance Evaluation of Wetlands in Northeast Kansas, Part 3 (Kansas State University) | | |

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

| | |
|---|----------------------------|
| Conservation Reserve Program (CRP) ^a : | <u>37,910 acres</u> |
| Wetlands Restoration Program (WRP): | <u>186 acres</u> |
| Grassland Reserve Program (GRP): | None |
| Farm and Ranch Lands Protection Program (FRPP): | None |

^a: Data from 2006 Farm Service Agency, CRP 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 Areas – 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

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.

11. 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/>.
12. Natural Resources Conservation Service, Watershed Plans, Studies, and Assessments completed, http://www.nrcs.usda.gov/programs/watershed/Surveys_Pln.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. Natural Resources Conservation Service, Kansas, Program Information is located at: <http://www.ks.nrcs.usda.gov/programs/>.

7.1 Additional On-line Resources

1. U. S. 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=10270102.
2. U. S. EPA Surf Your Watershed at: http://cfpub.epa.gov/surf/huc.cfm?huc_code=10270102.

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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 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 the Environmental Quality Incentives Program (EQIP), the 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 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 | | 380,000 | 360,000 | 20,000 | 380,000 | Acres | | | | |
| Cropland Needing Treatment | | 200,000 | 188,000 | 12,000 | 200,000 | Acres | | | | |
| Cropland Currently at RMS Level** | | 57,000 | 53,600 | 3,400 | 57,000 | Acres | | | | |
| Cropland Currently at Progressive Level*** | | 140,600 | 138,000 | 2,600 | 140,600 | Acres | | | | |
| Cropland Currently at Untreated Level | | 182,400 | 168,400 | 14,000 | 182,400 | Acres | | | | |
| Typical Cropland-Dryland Management Unit | | 80 | | | | | | | | |
| <p>* 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.</p> | | | | | | | | | | |
| Current Conditions for Cropland - Dryland | | | | | | | | | | |
| Management Systems | | Quantity | | Costs | | Effects | | | | |
| | Practices | Unit | Quantity | Investment Cost | Annual O&M Cost | Soil Erosion | Soil Condition | Water Quality, Surface | Human Economics | 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. | 168,400 | | | -3 | -1 | -3 | -2 | |
| | Conservation Cropping Rotation | Ac. | 168,400 | | | | | | | |
| | Residue Management | Ac. | 168,400 | | | | | | | |
| BM2 | | | 138,000 | | | 0 | -1 | -2 | -1 | |
| | Conservation Cropping Rotation | Ac. | 138,000 | | | | | | | |
| | Residue Management | Ac. | 138,000 | | | | | | | |
| | Terrace | Ac. | 41,400 | | | | | | | |
| RMS | | Ac. | 53,600 | | | +1 | 0 | 0 | +1 | |
| | Conservation Cropping Rotation | Ac. | 53,600 | | | | | | | |
| | Terrace | Ac. | 16,080 | | | | | | | |
| | Conservation Tillage | Ac. | 53,600 | | | | | | | |
| | Nutrient Management | Ac. | 53,600 | | | | | | | |
| | Pest Management | Ac. | 53,600 | | | | | | | |
| Desired/Estimated Participation Rates | | | | | | | | | | |
| | Proposed Practice Change | Rate | Acres | | | | Estimates: | | | |
| | Cropland-Dryland Conservation System | 58% | 109,040 | | | | 16,600 Acres needing terraces | | | |
| | Cropland-Irrigation Conservation System | 58% | 6,960 | | | | 200,000 Acres needing treatment | | | |
| | Total | | 116,000 | | | | 90,960 Acres are not expected to be treated | | | |

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| 1.1.2 Future Conditions | | Total | BM1 | BM2 | RMS1 | RMS2 | RMS3 | | | | | | |
|--|--------------------------------|----------|------------|---------------------|--------------------|--------------|----------------|------------------------|-----------------|----------------|------|-----|-------|
| Crop - Dryland | | 360,000 | 78,944 | 118,416 | 124,476 | 4,362 | 33,802 | | | | | | |
| 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 | EOIP | WHIP | WRP | Other |
| BM1 | | Ac. | 78,944 | | | -3 | -1 | -3 | -2 | | | | |
| | Conservation Cropping Rotation | Ac. | 78,944 | | \$47,366 | | | | | | | | |
| | Residue Management | Ac. | 78,944 | | \$1,737 | | | | | | | | |
| BM2 | | Ac. | 118,416 | | | 0 | -1 | -2 | -1 | | | | |
| | Conservation Cropping Rotation | Ac. | 118,416 | | \$71,050 | | | | | | | | |
| | Residue Management | Ac. | 118,416 | | \$2,605 | | | | | | | | |
| | Terrace | Ac. | 35,525 | | \$4,220,346 | | | | | | | | |
| RMS1 | | Ac. | 70,876 | | | +1 | +1 | +1 | +1 | | | | |
| | Conservation Cropping Rotation | Ac. | 70,876 | \$425,256 | \$42,526 | | | | | X | | | |
| | Grassed Waterway | Ac. | 1,885 | \$1,885,000 | \$56,550 | | | | | X | | | X |
| | Terrace | LF | 4,976,400 | \$4,478,760 | \$111,969 | | | | | X | | | X |
| | Conservation Tillage | Ac. | 70,876 | \$637,884 | \$63,788 | | | | | X | | | |
| | Terrace Restoration | LF | 14,326,000 | \$12,893,400 | \$322,335 | | | | | X | | | |
| | Filter Strip | Ac. | 3,544 | \$212,628 | \$1,063 | | | | | X | | | X |
| | Nutrient Management | Ac. | 70,876 | \$567,008 | \$56,701 | | | | | X | | | |
| | Pest Management | Ac. | 70,876 | \$425,256 | \$42,526 | | | | | X | | | |
| RMS2 | | Ac. | 4,362 | | | +4 | +4 | +4 | +3 | | | | |
| | Conservation Cover | Ac. | 4,362 | \$65,424,000 | \$654,240 | | | | | X | X | | X |
| | Native Grass Seeding | Ac. | 4,362 | \$218,080 | \$1,090 | | | | | X | X | | X |
| RMS3 | | Ac. | 87,402 | | | +3 | +2 | +2 | +2 | | | | |
| | Conservation Cropping Rotation | Ac. | 87,402 | \$524,414 | \$52,441 | | | | | X | | | |
| | Residue Management | Ac. | 87,402 | \$96,143 | \$1,923 | | | | | X | | | |
| | Nutrient Management | Ac. | 87,402 | \$699,219 | \$69,922 | | | | | X | | | |
| | Pest Management | Ac. | 87,402 | \$524,414 | \$52,441 | | | | | X | | | |
| | Terrace Restoration | Ft. | 6,832,400 | \$6,149,160 | \$153,729 | | | | | X | | | |
| | Filter Strip | Ac. | 4,370 | \$262,207 | \$1,311 | | | | | X | | | X |
| | Terrace | Ft. | 2,373,360 | \$2,136,024 | \$53,401 | | | | | X | | | X |
| | Grassed Waterway | Ac. | 899 | \$899,000 | \$26,970 | | | | | X | | | X |
| Total RMS Costs | | | | | | | | | | | | | |
| | | | | \$97,558,854 | \$6,081,060 | | | | | | | | |

| 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) | | \$955,439 |
| Operator Investment (25% Cost Share) | \$24,389,713 | |
| Federal Costs (75% Cost Share) | \$73,169,140 | |
| Total RMS Costs | \$97,558,854 | \$6,081,060 |
| Estimated Level of Participation | | 58% |
| Total acres projected to be in RMS System | 162,640 | |
| Total Annual Crop Production Benefit | \$1,036,399 | |
| 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 | 380,000 | 360,000 | 20,000 | 380,000 | Acres |
| Cropland Needing Treatment | 200,000 | 188,000 | 12,000 | 200,000 | Acres |
| Cropland Currently at RMS Level** | 57,000 | 53,600 | 3,400 | 57,000 | Acres |
| Cropland Currently at Progressive Level*** | 140,600 | 138,000 | 2,600 | 140,600 | Acres |
| Cropland Currently at Untreated Level | 182,400 | 168,400 | 14,000 | 182,400 | 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 | | 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 |
| BM1 | | Ac. | 14,000 | | | -3 | -1 | -3 | -2 |
| | Conservation Cropping Rotation | Ac. | 14,000 | | | | | | |
| | Conventional Tillage | Ac. | 14,000 | | | | | | |
| BM2 | | Ac. | 2,600 | | | 0 | -1 | 0 | -1 |
| | Conservation Cropping Rotation | Ac. | 2,600 | | | | | | |
| | Residue Management | Ac. | 2,600 | | | | | | |
| | Irrigation Water Management | Ac. | 2,600 | | | | | | |
| RMS1 | | Ac. | 3,400 | | | +2 | 0 | +1 | +1 |
| | Conservation Cropping Rotation | Ac. | 3,400 | | | | | | |
| | Conservation Tillage | Ac. | 3,400 | | | | | | |
| | Nutrient Management | Ac. | 3,400 | | | | | | |
| | Pest Management | Ac. | 3,400 | | | | | | |
| | Irrigation Water Management | Ac. | 3,400 | | | | | | |

| Desired/Estimated Participation Rates | | | | Estimates: |
|---|------|----------------|--|---|
| Proposed Practice Change | Rate | Acres | | |
| Cropland-Dryland Conservation System | 58% | 109,040 | | 12,000 Acres needing treatment |
| Cropland-Irrigation Conservation System | 58% | 6,960 | | |
| Total | | 116,000 | | 5,040 Acres are not expected to be treated |

| 1.2.2 Future Conditions | Total | BM1 | BM2 | RMS1 | RMS3 | RMS4 |
|-------------------------|--------|-------|-------|-------|-------|------|
| Crop - Irrigated | 20,000 | 5,216 | 7,824 | 4,872 | 1,949 | 139 |

| 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 Quality, Surface | Human Economics | EOIP | WHIP | WRP | Other |
| BM1 | | Ac. | 5,216 | | | -3 | -1 | -3 | -2 | | | | |
| | Conservation Cropping Rotation | Ac. | 5,216 | | \$3,130 | | | | | | | | |
| | Residue Management | Ac. | 5,216 | \$115 | | | | | | | | | |
| BM2 | | Ac. | 7,824 | | | 0 | -1 | 0 | -1 | | | | |
| | Conservation Cropping Rotation | Ac. | 7,824 | | \$4,694 | | | | | | | | |
| | Residue Management | Ac. | 7,824 | \$172 | | | | | | | | | |
| | Irrigation Water Management | Ac. | 7,824 | \$8,606 | | | | | | | | | |
| RMS1 | | Ac. | 8,272 | | | +2 | 0 | +1 | +1 | | | | |
| | Conservation Cropping Rotation | Ac. | 8,272 | \$49,632 | \$4,963 | | | | | X | | | |
| | Residue Management | Ac. | 8,272 | \$9,099 | \$182 | | | | | X | | | |
| | Nutrient Management | Ac. | 8,272 | \$66,176 | \$6,618 | | | | | X | | | |
| | Pest Management | Ac. | 8,272 | \$49,632 | \$4,963 | | | | | X | | | |
| | Irrigation Water Management | Ac. | 8,272 | \$90,992 | \$9,099 | | | | | X | | | |
| RMS3 | | Ac. | 1,949 | | | +3 | +2 | +2 | +2 | | | | |
| | Conservation Cropping Rotation | Ac. | 1,949 | \$11,693 | \$1,169 | | | | | X | | | |
| | Conservation Tillage | Ac. | 1,949 | \$17,539 | \$1,754 | | | | | X | | | |
| | Nutrient Management | Ac. | 1,949 | \$15,590 | \$1,559 | | | | | X | | | |
| | Pest Management | Ac. | 1,949 | \$11,693 | \$1,169 | | | | | X | | | |
| RMS4 | | Ac. | 139 | | | +2 | +1 | +1 | +1 | | | | |
| | Conservation Cropping Rotation | Ac. | 139 | \$835 | \$84 | | | | | X | | | |
| | Conservation Tillage | Ac. | 139 | \$1,253 | \$125 | | | | | X | | | |
| | Irrigation Water Management | Ft. | 139 | \$1,531 | \$153 | | | | | X | | | |
| | Irrigation System, Sprinkler (conversion) | Ft. | 139 | \$7,934,400 | \$39,672 | | | | | X | | | X |
| Total RMS Costs | | | | \$8,260,066 | \$88,228 | | | | | | | | |

| 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) | | \$31,839 |
| Operator Investment (25% Cost Share) | \$2,065,016 | |
| Federal Costs (75% Cost Share) | \$6,195,049 | |
| Total RMS Costs | \$8,260,066 | \$88,228 |
| Estimated Level of Participation | 58% | |
| Total acres projected to be in RMS System | 6,960 | |
| Total Annual Crop Production Benefit | \$83,483 | |
| 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 | | |

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2.0 Grazed Range

2.1 Native Grassland

| 2.1.1 Current Conditions | Grazed | Ungrazed | Total | |
|---------------------------------|---------|----------|---------|-------|
| Total Grazed Range | 540,000 | 0 | 540,000 | Acres |
| Grazed Range Needing Treatment | 400,000 | 0 | 400,000 | |
| Total Range with Brush Invasion | 260,000 | 0 | 260,000 | 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. | 400,000 | | | -3 | -3 | -1 | -2 | |
| | Pond | No. | 625 | | | | | | | |
| | Watering Facility | No. | 2,500 | | | | | | | |
| | Fence | Mi. | 5,000 | | | | | | | |
| BM2 | | Ac. | 140,000 | | | +1 | +1 | +1 | +1 | |
| | Prescribed Grazing | Ac. | 140,000 | | | | | | | |
| | Pond | No. | 219 | | | | | | | |
| | Watering Facility | No. | 875 | | | | | | | |
| | Pipeline | Ft. | 175,000 | | | | | | | |
| | Fence | Mi. | 1,750 | | | | | | | |
| Desired/Estimated Participation Rates | | | | | | | | | | |
| | Proposed Practice Change | Rate | Acres | | | | | | | |
| | Grazing System | 58% | 232,000 | | | | | | | |
| | Brush Management | 58% | 150,800 | | | | | | | |
| | Prescribed Burning | 58% | 232,000 | | | | | | | |

| 2.1.2 Future Conditions | Total | BM1 | BM2 | RMS |
|-------------------------|---------|---------|---------|---------|
| Grazed Range | 540,000 | 168,000 | 140,000 | 232,000 |

| 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 | EOIP | WHIP | WRP | Other |
| BM1 | | Ac. | 168,000 | | | -3 | -3 | -1 | -2 | | | | |
| | Pond | No. | 263 | | \$31,500 | | | | | | | | |
| | Watering Facility | No. | 1,050 | | \$48,300 | | | | | | | | |
| | Fence | Mi. | 2,100 | | \$443,520 | | | | | | | | |
| BM2 | | Ac. | 140,000 | | | +1 | +1 | +1 | +1 | | | | |
| | Prescribed Grazing | Ac. | 140,000 | | \$138,600 | | | | | | | | |
| | Pond | No. | 219 | | \$26,250 | | | | | | | | |
| | Watering Facility | No. | 875 | | \$40,250 | | | | | | | | |
| | Pipeline | Ft. | 2,275,000 | | \$40,950 | | | | | | | | |
| | Fence | Mi. | 1,750 | | \$369,600 | | | | | | | | |
| RMS | | Ac. | 232,000 | | | +3 | +3 | +3 | +2 | | | | |
| | Prescribed Grazing | Ac. | 232,000 | \$696,000 | \$229,680 | | | | | X | | | |
| | Fence | LF | 1,740,000 | \$3,480,000 | \$69,600 | | | | | X | | | X |
| | Brush Management | Ac. | 150,800 | \$7,540,000 | \$226,200 | | | | | X | X | | |
| | Prescribed Burning | Ac. | 232,000 | \$464,000 | \$464 | | | | | X | X | | |
| | Pond | No. | 348 | \$4,176,000 | \$41,760 | | | | | X | X | | X |
| | Watering Facility | No. | 377 | \$867,100 | \$17,342 | | | | | X | | | X |
| | Pipeline | Ft. | 52,780 | \$95,004 | \$950 | | | | | X | | | X |
| | Spring Development | No. | 261 | \$652,500 | \$13,050 | | | | | X | | | X |
| | Pest Management | Ac. | 92,800 | \$556,800 | \$55,680 | | | | | X | X | | X |
| | Streambank & Shoreline Protection | Ft. | 533,600 | \$32,016,000 | \$640,320 | | | | | X | | | X |
| | Total RMS Costs | | | \$50,543,404 | \$2,434,016 | | | | | | | | |

| 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) | | \$285,824 |
| Operator Investment (25% Cost Share) | \$12,635,851 | |
| Federal Costs (75% Cost Share) | \$37,907,553 | |
| Total RMS Costs | \$50,543,404 | \$2,434,016 |
| Estimated Level of Participation | 58% | |
| Total acres projected to be in RMS System | 232,000 | |
| Total Annual Grazing Production Benefits | \$529,774 | |
| 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 | 120,000 | 0 | 120,000 | Acres |
| Pasture/Hay Land Needing Treatment | 36,000 | 0 | 36,000 | 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/Hay Land

| Pasture | 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 | Plant Condition | |
| BM1 | Ac. | 36,000 | | | -3 | |
| Pond | No. | 225 | | | | |
| Watering Facility | No. | 225 | | | | |
| Pipeline | Ft. | 45,000 | | | | |
| Fence | Mi. | 675 | | | | |
| BM2 | Ac. | 84,000 | | | +1 | |
| Prescribed Grazing | Ac. | 84,000 | | | | |
| Pond | No. | 131 | | | | |
| Watering Facility | No. | 919 | | | | |
| Pipeline | Ft. | 183,750 | | | | |
| Fence | Mi. | 1,575 | | | | |

Desired/Estimated Participation Rates

| Proposed Practice Change | Rate | Acres |
|--------------------------|------|--------|
| Pasture/Hay Land System | 58% | 20,880 |

| 3.1.2 Future Conditions | Total | BM1 | BM2 | RMS |
|-------------------------|---------|--------|--------|--------|
| Pasture/Hay Land | 120,000 | 15,120 | 84,000 | 20,880 |

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 | EQIP | WHIP | WRP | Other |
| BM1 | Ac. | 15,120 | | | -3 | | | | |
| Pond | No. | 24 | | \$2,835 | | | | | |
| Water Facility | No. | 71 | | \$8,505 | | | | | |
| Fence | Mi. | 189 | | \$39,917 | | | | | |
| BM2 | Ac. | 84,000 | | | +1 | | | | |
| Prescribed Grazing | Ac. | 84,000 | | \$83,160 | | | | | |
| Pond | No. | 131 | | \$15,750 | | | | | |
| Water Facility | No. | 394 | | \$47,250 | | | | | |
| Pipeline | Ft. | 1,023,750 | | \$18,428 | | | | | |
| Fence | Mi. | 1,050 | | \$221,760 | | | | | |
| RMS | Ac. | 20,880 | | | +3 | | | | |
| Prescribed Grazing | Ac. | 20,880 | \$62,640 | \$20,671 | | X | | | |
| Nutrient Management | Ac. | 20,880 | \$167,040 | \$16,704 | | X | | | |
| Pest Management | Ac. | 20,880 | \$125,280 | \$12,528 | | X | | | |
| Water Facility | No. | 261 | \$1,566,000 | \$31,320 | | X | | | X |
| Pipeline | Ft. | 287,100 | \$516,780 | \$5,168 | | X | | | X |
| Total RMS Costs | | | \$2,437,740 | \$523,995 | | | | | |

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) | | \$49,903 |
| Operator Investment (25% Cost Share) | \$609,435 | |
| Federal Costs (75% Cost Share) | \$1,828,305 | |
| Total RMS Costs | \$2,437,740 | \$523,995 |
| Estimated Level of Participation | 58% | |
| Total acres projected to be in RMS System | 20,880 | |
| Total Annual Forage Production Benefits | \$29,617 | |
| Beneficial Effects of Proposed RMS System | | |
| Improves plant condition, health and vigor | | |

4.0 Animal Feeding Operations (AFO)

4.1 AFO - Private

| 4.1.1 Current Conditions | Permitted CAFOs | Confined Livestock Facilities | Concentrated Non-confined Livestock Operations | Total | |
|--------------------------|-----------------|-------------------------------|--|-------|-----|
| Estimated AFO (no.) | 83 | 640 | 1,355 | 2,078 | No. |
| AFO Needing Treatment | 0 | 640 | 1,355 | 1,995 | No. |

* 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, untreated units and progressive systems will be treated to RMS level at the expected adoption rate.

| Current Conditions for AFO - Private | | | | | |
|--|----------|----------|-----------------|-----------------|------------------------|
| Management Systems | Quantity | | Costs | | Effects |
| Practices | Unit | Quantity | Investment Cost | Annual O&M Cost | Water Quality, Surface |
| BM1 | No. | 1,995 | | | -4 |
| No Treatment | No. | 1,995 | | | |
| RMS | No. | 83 | | | +3 |
| Waste Storage Facility | No. | 42 | | | |
| Pond Sealing or Lining | No. | 42 | | | |
| Manure Transfer | No. | 83 | | | |
| Composting Facility | No. | 25 | | | |
| Animal Mortality Facility | No. | 25 | | | |
| Waste Treatment Lagoon | No. | 66 | | | |
| Solid/Liquid Waste Separation Facility | No. | 25 | | | |
| Critical Area Seeding | Ac. | 415 | | | |
| Fence | LF | 83,000 | | | |

Note: Effects are described as a numerical value placed on benchmark conditions and degree of change from benchmark conditions by various conservation systems. Scale ranges from -5 (most damaging to resources) to +5 (least damaging, best protection offered by treatment).

| Desired/Estimated Participation Rates | | | |
|---------------------------------------|------|-------|--|
| Proposed Practice Change | Rate | Acres | |
| Conservation System AFO - Private | 58% | 1,157 | |
| Total | | 1,157 | |

| 4.1.2 Future Conditions | Total | BM1 | RMS |
|--|-------|-----|-------|
| Conservation Systems AFO - Private (No.) | 2,078 | 838 | 1,240 |

| Future Conditions for AFO - Private | | | | | | | | | |
|--|----------|-----------|---------------------|------------------|------------------------|----------------|------|-----|-------|
| Management Systems | Quantity | | Costs | | Effects | Implementation | | | |
| Practices | Unit | Quantity | Investment Cost | Annual O&M Cost | Water Quality, Surface | EQIP | WHIP | WRP | Other |
| BM1 | No. | 838 | | | -4 | | | | |
| No Treatment | No. | 838 | | | | | | | |
| RMS | No. | 1,240 | | | +3 | | | | |
| Waste Storage Facility | No. | 372 | \$18,601,500 | \$186,015 | | X | | | X |
| Pond Sealing or Lining | No. | 372 | \$4,241,142 | \$21,206 | | X | | | X |
| Manure Transfer | No. | 372 | \$2,529,804 | \$25,298 | | X | | | |
| Composting Facility | No. | 372 | \$5,580,450 | \$55,805 | | X | | | X |
| Animal Mortality Facility | No. | 372 | \$3,348 | \$67 | | X | | | X |
| Waste Treatment Lagoon | No. | 372 | \$6,324,510 | \$63,245 | | X | | | X |
| Solid/Liquid Waste Separation Facility | No. | 372 | \$22,322 | \$446 | | X | | | X |
| Critical Area Seeding | Ac. | 6,201 | \$682,055 | \$6,821 | | X | | | X |
| Fence | LF | 1,240,100 | \$2,480,200 | \$49,604 | | X | | | X |
| Total RMS Costs | | | \$40,465,331 | \$408,506 | | | | | |

| 4.1.3 Potential RMS Effects Summary for AFO - Private | | |
|---|---------------------|------------------|
| Cost Items and Programs | Costs | O&M Costs |
| Potential Farm Bill Programs | | |
| Annual Management Incentives (3 yrs - Incentive Payments) | | \$25,298 |
| Operator Investment (25% Cost Share) | \$10,116,333 | |
| Federal Costs (75% Cost Share) | \$30,348,998 | |
| Total RMS Costs | \$40,465,331 | \$408,506 |
| Estimated Level of Participation | 58% | |
| Total Annual Animal Feeding Operation Benefit | \$408,738 | |

Beneficial Effects of Proposed RMS System
Reduces Excessive Organics and Nutrients from Entering Stream Systems and Degrading Water Quality