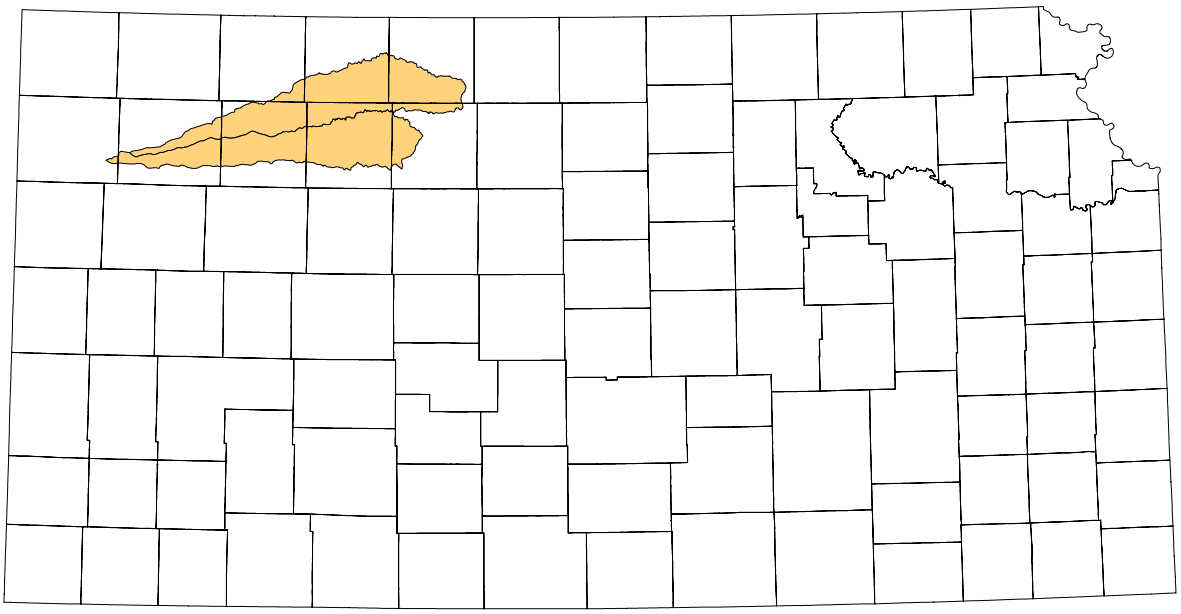
KANSAS
Rapid Watershed Assessment

Upper North Fork Solomon Watershed
Hydrologic Unit Code – 10260011
Upper South Fork Solomon Watershed
Hydrologic Unit Code – 10260013



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Produced by:

United States Department of Agriculture
Natural Resources Conservation Service
760 South Broadway
Salina, Kansas 67401

Kansas State Research and Extension
Manhattan, Kansas 66506

Kansas Center for Agricultural Resources and Environment
44 Waters Hall
Manhattan, Kansas 66506

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NOTE: ***In this report, the Upper North Fork Solomon and the Upper South Fork Solomon watersheds will be treated as one watershed and all information will be combined.***

Resource Profile

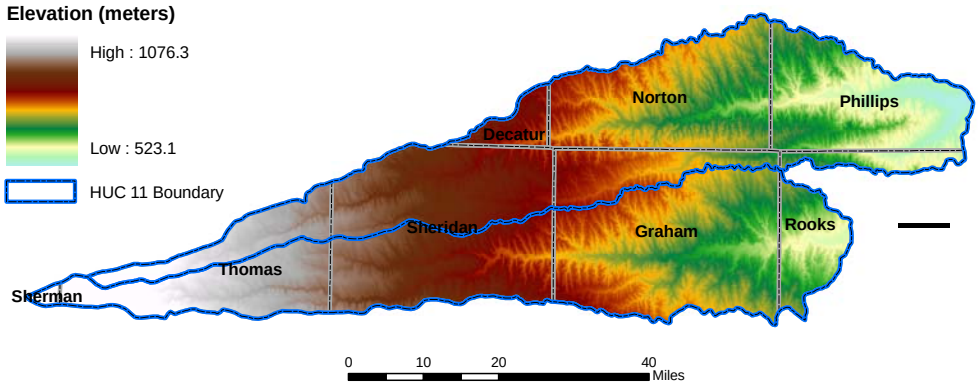
1.0 Purpose

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 Upper North and South Forks of the Solomon River sub-basin's natural resources, resource concerns, conservation needs, and ability to resolve natural resource issues and concerns.

2.0 Introduction

The Upper North Fork and Upper South Fork Solomon River sub-basin is comprised of 1,630,640 acres in northwestern Kansas and primarily includes the counties of Thomas, Sheridan, Graham, Norton, Rooks and Phillips with small land coverages in Sherman and Decatur counties. The Upper North Fork Solomon watershed flows west to east and empties into Kirwin Lake, while the Upper South Fork Solomon also flows west to east emptying into Webster Lake. Thirty-five percent of the sub-basin is in grain and row crop; 62 percent is in grassland, pasture, and hay; and the rest is in other various land uses (see Table 3.3.1).[5]

Relief Map[1]



Resource concerns are numerous in the sub-basin. Stakeholders in the watershed emphasize the importance of implementing use efficiency from surface and groundwater sources, promoting a reduction in commercial chemical and fertilizer runoff, reducing livestock and pet waste runoff, and increasing the awareness of the public concerning water quality in the watershed.

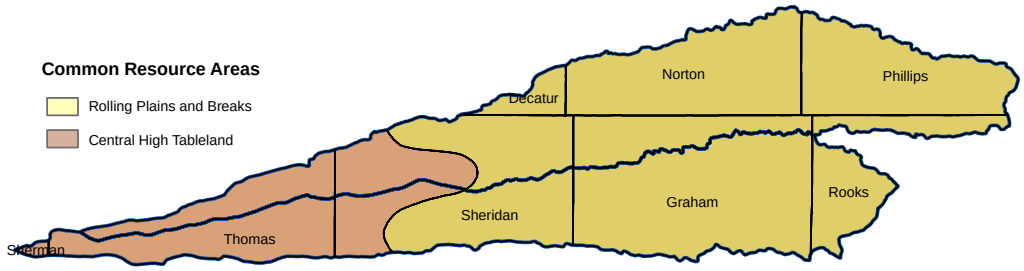
In 2002, there were approximately 1,254 farms with an average size of 1,258 acres in the Upper North and South Fork Solomon sub-basin.[2]

Eight Natural Resources Conservation Service (NRCS) field offices, eight county Conservation Districts (CDs), and the Solomon Valley and the Western Prairie Resource Conservation and Development (RC&D) areas provide conservation assistance to all the counties in the watershed.

3.0 Physical Description

The physical description of the Upper North and South Fork Solomon 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[3]

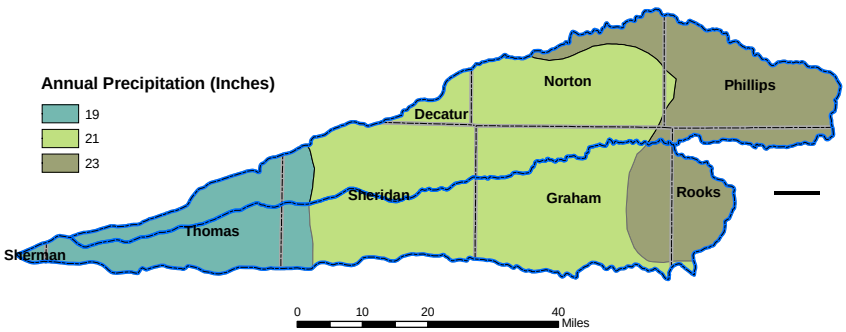


73.1 Rolling Plains and Breaks: The Rolling Plains and Breaks CRA is dissected plains having broad undulating to rolling ridge-tops, loess mantled, and hilly to steep side-slopes. Local relief reaches 300 feet and is dissected with narrow drainage ways and river valleys. Soils are deep on the ridge-tops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

72.1 Central High Tableland: The Central High Tableland CRA is broad, level to gently rolling, loess mantled tableland. Local relief is measured in feet on the tableland, tens of feet and major river valleys are bordered by steep slopes. Soils are deep. Presettlement vegetation was short grass prairies. Nearly all of this area is in cropland, both dryland small grain crops and irrigated corn and grain sorghum.

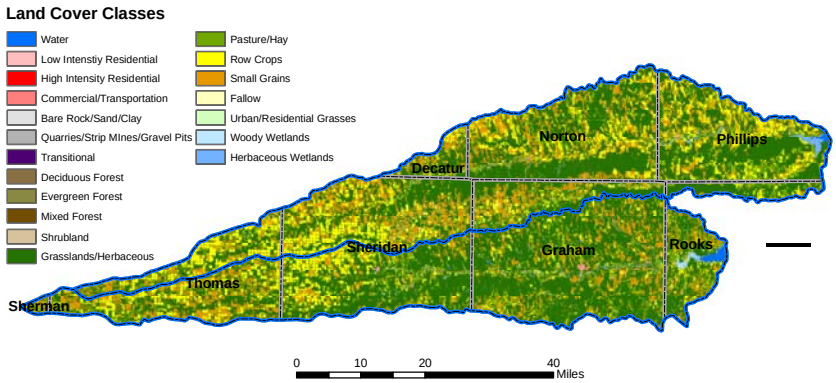
3.2 Precipitation Map[4]

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



3.3 Land Use and Land Cover Distribution Map[5]

The map below represents the distribution of land cover and land use as defined by the National Land Cover Dataset (NLCD).



3.3.1 Land Use and Land Cover Summary Table

Land Cover/Land Use	Ownership							
	Private		Public		Tribal			
	Acres	%	Acres	%	Acres	%	Totals	%
Water	2287	0.14	3182	0.20	0	0	5469	0.34
Low Intensity Residential	1148	0.07	0	0.00	0	0	1148	0.07
High Intensity Residential	194	0.01	0	0.00	0	0	194	0.01
Commercial/Industrial/ Transportation	3068	0.19	25	0.00	0	0	3094	0.19
Bare Rock/Sand/Clay	2181	0.13	12	0.00	0	0	2193	0.13
Quarries/Strip Mines/Gravel Pits	43	0.00	0	0.00	0	0	43	0.00
Transitional	2	0.00	0	0.00	0	0	2	0.00
Deciduous Forest	9299	0.57	521	0.03	0	0	9820	0.60
Evergreen Forest	893	0.05	43	0.00	0	0	936	0.06
Mixed Forest	26	0.00	0	0.00	0	0	26	0.00
Shrubland	2538	0.16	11	0.00	0	0	2548	0.16
Grasslands/Herbaceous	923946	56.68	4262	0.26	0	0	928208	56.94
Pasture/Hay	87438	5.36	1237	0.08	0	0	88676	5.44
Row Crops	276303	16.95	2171	0.13	0	0	278474	17.08
Small Grains	284202	17.43	663	0.04	0	0	284864	17.48
Fallow	9466	0.58	8	0.00	0	0	9473	0.58
Urban/Recreational	370	0.02	0	0.00	0	0	370	0.02
Woody Wetlands	3410	0.21	134	0.01	0	0	3544	0.22
Emergent Herbaceous Wetlands	7795	0.48	3228	0.20	0	0	11023	0.68
HUC Totals	1614608	99.05	15498	0.95	0	0	1630106	100.00

[a]: *Totals are approximate due to rounding and small unknown acreages.*

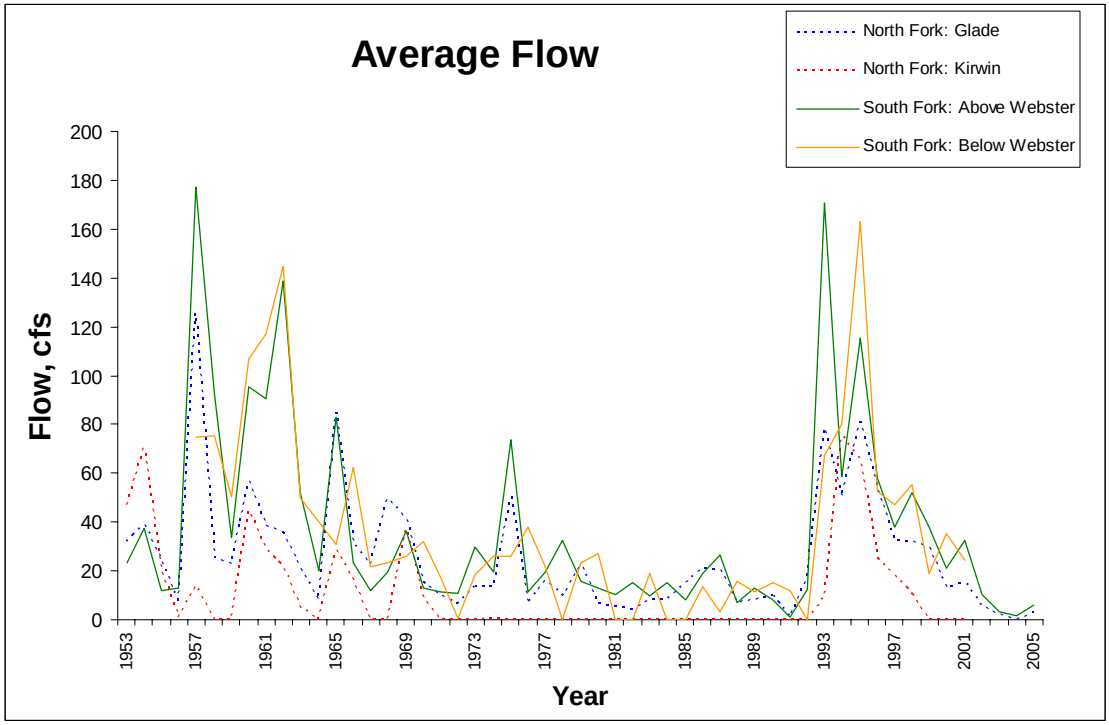
Special Considerations for This 8-Digit HUC:

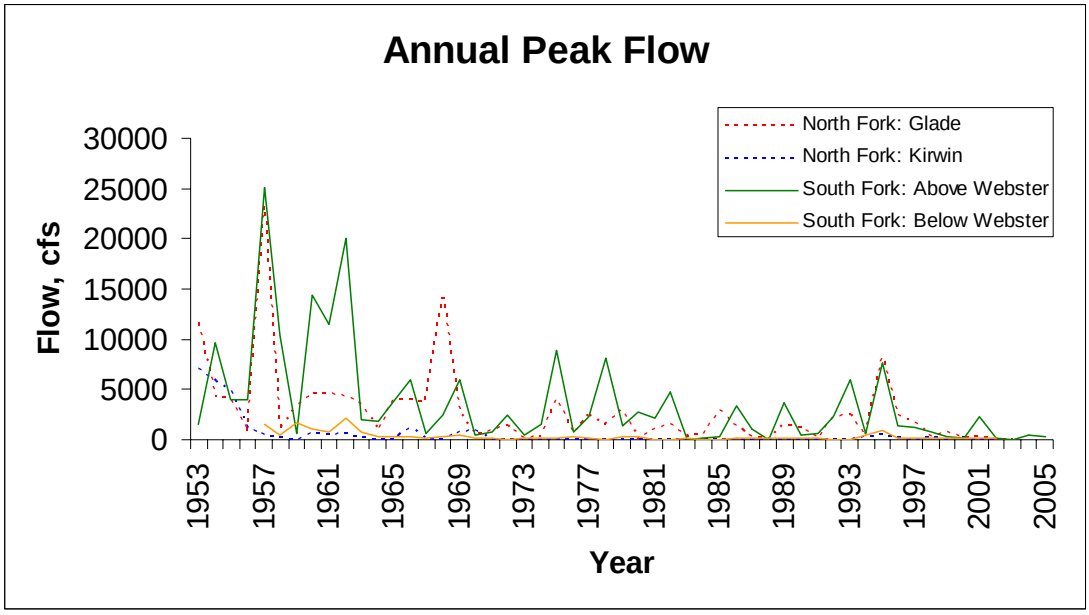
- Small grains and row crops are the predominant commodities grown in rotation on cropland. Wheat is the predominant crop grown. Corn is the predominant crop grown under irrigation.[6]
- Grasslands/Herbaceous and Pasture/Hay constitute approximately 62 percent of the watershed.
- Pasture is included 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	Percent of Cropland	Percent of HUC
	14.5%	5.1%

3.4 Stream Flow Data[7, 8]

For this assessment, data was collected from two stream gage stations along the Upper North Fork Solomon River: one at Glade and one at Kirwin. Data was collected from two stream gage stations along the Upper South Fork Solomon River: one above Webster and one below Webster.





3.5 Other Physical Descriptions

Stream Data	Total Miles	944[9]
Land Cover/Land Use[10]	**Acres**	**%**
Water	809	0.58
Low Intensity Residential	64	0.05
High Intensity Residential	6	0.00
Commercial/Industrial/Transportation	251	0.18
Bare Rock/Sand/Clay	155	0.11
Quarries/Strip Mines/Gravel Pits	7	0.01
Transitional	0	0.00
Deciduous Forest	2,851	2.03
Evergreen Forest	239	0.17
Mixed Forest	7	0.00
Shrubland	284	0.20
Grasslands/Herbaceous	93,151	66.31
Pasture/Hay	9,953	7.08
Row Crops	16,414	11.68
Small Grains	12,713	9.05
Fallow	411	0.29
Urban/Recreational	41	0.03
Woody Wetlands	769	0.55
Emergent Herbaceous Wetlands	2,354	1.68
Total Acres of 100-foot Buffers	**140,478**	**100.00**

[a]: *Totals are approximate due to rounding and small unknown acreages.*

4.0 Resource Concerns

Resource concerns are issues related to the natural environment. Natural resources include soil, water, air, plants, animals, and humans. Watershed Restoration and Protection Strategy (WRAPS) Stakeholder Leadership Teams (SLT) identified major resource issues that affect the Upper North and South Fork Solomon sub-basin.

4.1 Summary of Resource Concerns[11]

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
Water Quantity	Inefficient water use on irrigated land		X	X				
	Rangeland Hydrologic Cycle	X			X			
	Aquifer Overdraft		X	X				X
Water Quality, Ground Water	Harmful levels of pesticides		X	X				X
	Excessive nutrients and organics		X	X				X
	Excessive salinity		X	X				X
Water Quality, Surface	Harmful levels of pesticides		X	X				X

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
	Excessive nutrients and organics	X	X	X	X		X	X
	Excessive salinity		X	X	X			X
	Harmful level of pathogens				X		X	X
Animal: Domestic	Inadequate stock water	X			X			
Other Concerns: Water Conservation	Urban water conservation							X
	Urban storm water management							X
	Flow meters and other water saving devices		X	X				
	Well head protection	X	X	X	X			X
Human: Other Concerns	Household hazardous waste							X
	Municipal drought plan							X
	Education of residents in the watershed concerning water quality and quantity							X

Listed below are the concerns expressed for their watershed and practices to address these concerns from the WRAPS SLT:

Water Quantity

a. Promote the use of low flow home units such as showerheads and toilets by showing the economic savings.
b. General education to the public about water use through newsletters, brochures in city water bills, newspaper articles, CD newsletters.
c. Hold a winter forum to discuss water issues with a question and answer period.
d. Work toward better storm water management in communities through the installation and use of rain gardens.
e. Reduce the water wasted by inefficient irrigation.
f. Encourage conservation districts within the watershed to set up rules enforcing the use of flow meters and other water saving devices.
g. Demonstrate these tools in a field day setting.
h. Promote government programs such as Environmental Quality Incentives Program (EQIP).
i. Educate public on water usage during the growth cycle of a crop, both irrigated and non-irrigated. Also educate about how economics play a role.
j. Plan for drought conditions and educate public on ways to conserve water.
k. Promote conservation practices with urban and rural residents through education.
l. Education about the hydrologic cycle.
m. Make sure city drought plan is up to date.

Water Quality

a. Educate public about wellhead protection areas by placing signage and using source water brochures from the Kansas Department of Health and Environment (KDHE).
b. Make educational material available at place of purchase promoting proper application times and amounts.
c. Encourage the use of buffer strips by explaining the damage done to aquatic life from chemical and fertilizer contamination.

Animal: Domestic

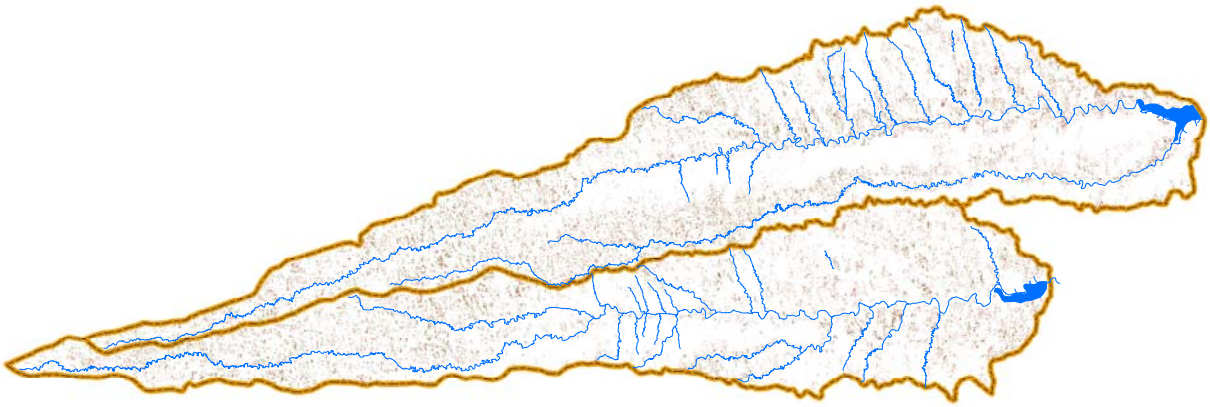
a. Demonstrate and educate on alternative livestock watering systems; i.e., stream crossing, fencing off ponds/river, automatic waters, etc.
b. Public signage and education of proper pet waste disposal placed in parks, vet offices, feed mill, city offices, etc.

Human: Other Concerns

a. Educate the public on the importance of a functioning watershed.
   1. Manage snowmelt and salt contamination through programs with the city and state offices.
b. Illegal dumping of trash.
   1. Educate public on current household hazardous waste disposal sites and help coordinate sites for those areas where one is not available.
   2. Have an ag waste clean up day(s).
c. Increase the general education of the public about water quality and quantity.
   1. Newspaper articles or a weekly column.
   2. Newsletters, Farm Service Agency (FSA), NRCS, Extension, etc.
   3. Radio Public Service Announcement (PSA).
   4. City water bill brochures.
   5. Short mailings with humor included.
   6. Education on the windshield at ball games with humor included.
   7. Girl Scouts.
   8. E.A.R.T.H. program from middle school students.
   9. World Water Monitoring Day for all ages.
   10. Quick read of fact with eye appeal.
   11. Brochures or placemats at restaurants.
   12. Booth at county fairs.

4.2 Sediment Erosion Potential[12]

Geographic Information System (GIS) was utilized to assess terrestrial landscapes for erosion potential by calculating a Revised Universal Soil Loss Equation (RUSLE) value on a raster basis (30 m X 30 m).



Sediment Erosion Potential

- Low
- Moderate
- High
- Very High

- Waterbodies
- Streams and Rivers
- HUC 8 Boundaries

0 5 10 20 Miles

4.3 Water Quality Conditions

The 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/tmdl/solomon.htm.

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 structures 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[13]

Animal/Operation Type	Dairy	Feedlot	Poultry	Swine
Number of Permitted Farms	1	24	0	3
Number of Certified Farms	0	17	0	1
Total Number of Animal Units	98	92,141	0	4,132

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 57 active public water supply wells located within this watershed. Due to the lack of surface water in this watershed, only one public water supply draws from surface water – the South Fork Solomon River. Major groundwater aquifers underlying this watershed include the Dakota Aquifer and small branches of the High Plains Aquifer along with alluvial aquifers of the South Fork Solomon 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[14]

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	PCR	DS	FP	GR	IW	IR	LW
Antelope Cr	E	O						
Ash Cr	E							
Beaver Cr	E							
Big Timber Cr	E			X				
Bow Cr Segment 15	E			X				
Bow Cr Segment 16	E	O		X				
Bow Cr South	E	O						
Cactus Cr	E							
Coon Cr	E	O						
Crooked Cr	E							
Elk Cr	E							
Elk Cr East	E							
Foster Cr	E	O						
Game Cr	E							
Jackson Br	E	O						
Lost Cr	E							
Martin Cr	E	O						
Rock Cr	E	O						
Sand Cr Segment 26	E							
Sand Cr Segment 15	E	O						
Sand Cr Segment 27	E	O						
Scull Cr	E							
Skunk Cr	E	O						
Slate Cr	E	O						
Solomon River N Fk	E	X	X	X	X	X	X	X
Solomon River S Fk	E	X	X	X	X	X	X	X
Spring Cr	E							
Storer Cr	E	O						
Wildhorse Cr	E	O						
Wolf Cr	E							
Youngs Cr	E	O						

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

E = Expected Aquatic Life Use Water
X = Referenced stream segment is assigned the indicated designated use
O = Referenced stream segment does not support the indicated beneficial 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	
Stream Miles	944
Stream miles that do not meet designated uses, miles	111[15]

2004 Impaired Waters with TMDLs[16]		
Stream/Lake with TMDL	**Priority for TMDL Implementation**	**Impairments**
Upper N Fork Solomon River	Low	Sulfate
Upper N Fork Solomon River	Low	Selenium
Bow Creek	Low	Selenium
Stream/Lake with TMDL	**Priority for TMDL Implementation**	**Impairments**
Upper S Fork Solomon River	Low	Sulfate
Upper S Fork Solomon River	Low	Selenium
Kirwin Lake	Medium	Eutrophication
Kirwin Lake	Medium	Dissolved Oxygen
Logan City Lake	Low	Eutrophication
Sheridan Co State Fishing Lake	Medium	Eutrophication

2004 Impaired Waters with TMDLs[16]		
Stream/Lake with TMDL	**Priority for TMDL Implementation**	**Impairments**
Sheridan Co State Fishing Lake	Medium	Dissolved Oxygen
Webster Lake	Medium	Eutrophication
Webster Lake	Low	Sulfate

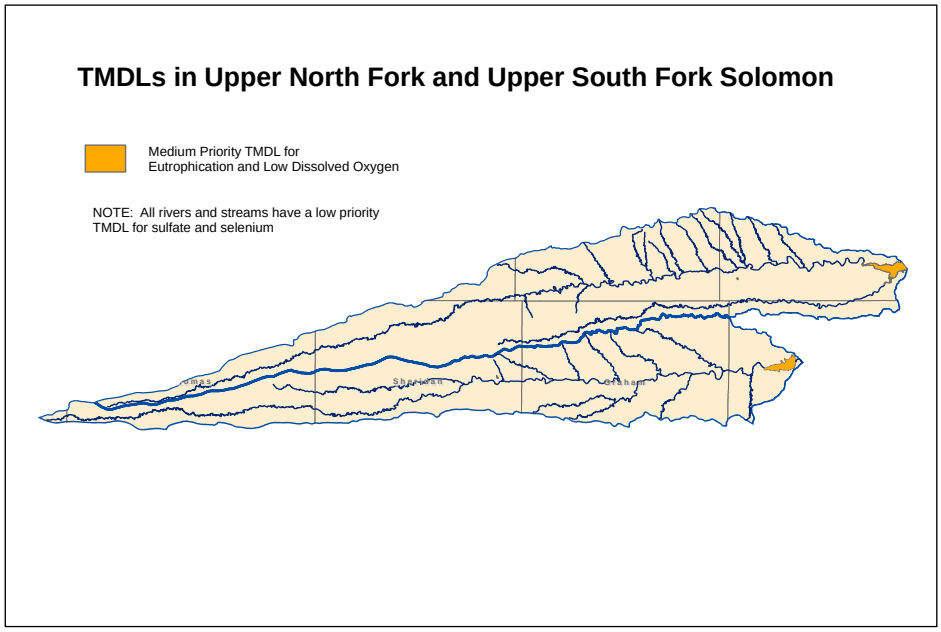
Impairment definitions:

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.

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.

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



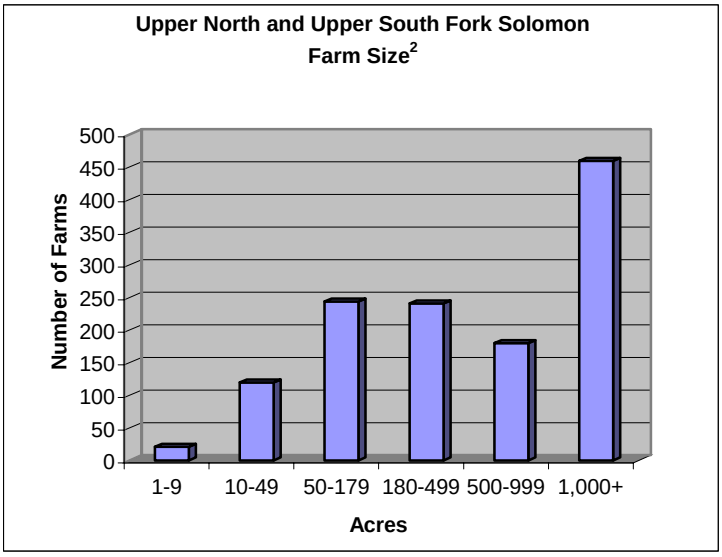
4.4 Threatened and Endangered Species Status[17]

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

LISTED THREATENED AND ENDANGERED SPECIES			
Species Common Name (*Scientific name*)	**Threatened (THR), Endangered (END), Proposed (P), Candidate (C)**	**Designated Critical Habitat (Y)es/(N)o**	**Listing: Federal (F), State (S)**
Animals, Vertebrates - Birds			
Bald Eagle (Haliaeetus leucocephalus)	THR	N	F, S
Eskimo Curlew (Numenius borealis)	END	N	F, S
Least Tern (Sterna antillarum)	END	N	F, S
Peregrine Falcon (Falco peregrinus)	END	N	S
Piping Plover (Charadrius melodus)	THR	N	F, S
Snowy Plover (Charadrius alexandrinus)	THR	N	S
Whooping Crane (Grus americana)	END	N	F, S
Animals, Vertebrates - Fishes			
Topeka Shiner (Notropis Topeka)	END, THR	N	F, S
Animals, Vertebrates - Mammal			
Black-footed Ferret (Mustela nigripes)	END	N	F, S
Eastern Spotted Skunk (Spilogale putorius)	THR	N	S

SPECIES IN NEED OF CONSERVATION		
Species Common Name (*Scientific name*)	**Status: Species in Need of Conservation (SNC)**	**Listing: Federal (F) State (S)**
Animals, Vertebrates - Birds		
Black Tern (Childonias niger)	SNC	S
Bobolink (Dolichonyx oryzivorus)	SNC	S
Chihuahuan Raven (Corvus cryptoleucus)	SNC	S
Curve-billed Thrasher (Toxostoma curvirostre)	SNC	S
Ferruginous Hawk (Buteo regalis)	SNC	S
Golden Eagle (Aquila chrysaetos)	SNC	S
Long-billed Curlew (Numenius americanus)	SNC	S
Mountain Plover (Charadrius montanus)	SNC	S
Short-eared Owl (Asio flammeus)	SNC	S
Whip-poor-will (Camprimulgus vociferous)	SNC	S
Animals, Vertebrates – Fishes		
Brassy Minnow (Hybognathus hankinsoni)	SNC	S
Plains Minnow (Hybognathus placitus)	SNC	S
Animals, Vertebrates - Mammal		
Franklin's Ground Squirrel (Spermophilus franklinii)	SNC	S
Animals, Vertebrates - Reptiles		
Eastern Hognose Snake (Heterodon platirhinos)	SND	S
Western Hognose Snake (Heterodon nasicus)	SNC	S

5.0 Census and Social Data



Number of Farms: **1,254**
- Average Farm Size: **1,258 acres**

Number of Operators: **2,238**
- Principle Full-Time Operators: **860**
- Principle Part-Time Operators: **1,378**

5.1 Estimated Level of Willingness and Ability to Participate in Conservation[18]

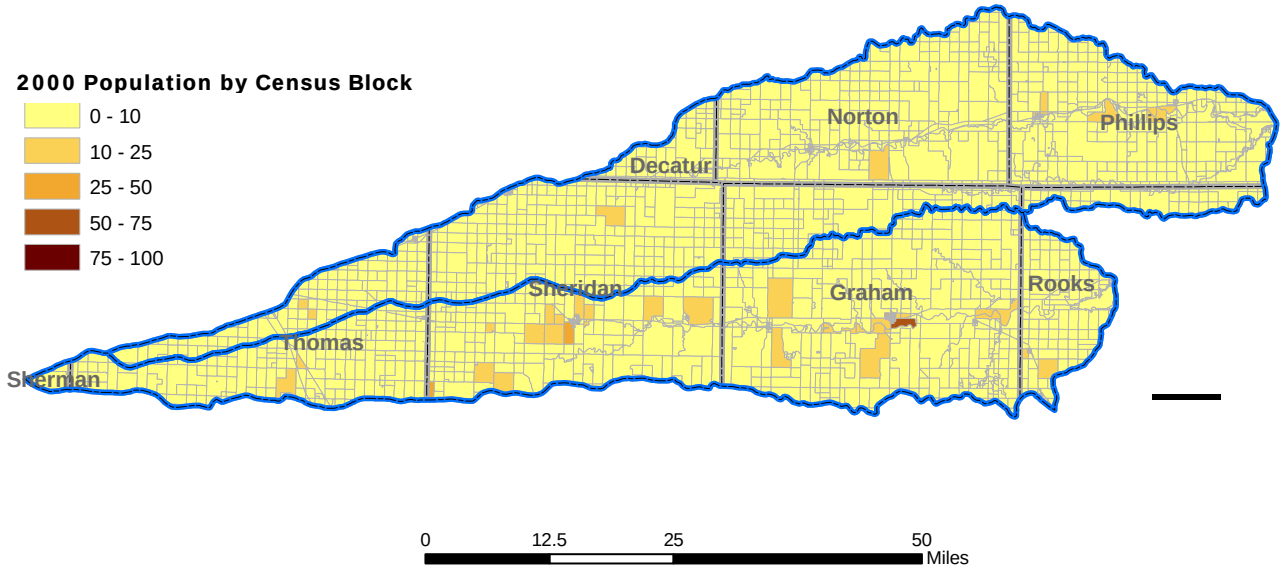
There is a likelihood of full conservation participation in the first 5 years with moderate adjustments in technical and financial assistance, and conservation marketing. There are high management skills in the watershed. Technical assistance delivery system is effective, indicating that the residents of the watershed are aware that technical assistance is available. The information and education delivery system needs minor modifications. Existing financial incentives need to be expanded or increased to improve the participation rate and accelerate participation.

5.2 Evaluation of Social Capital[19]

Social capital is defined as bonds of trust that arise between people interacting in everyday life. Results from a survey filled out by local conservationists are as follows:

> Watershed residents are highly motivated to be active citizens. They are actively involved in volunteering in community projects, church memberships, vote regularly, have a high school degree, and are connected via the Internet. They are also involved in Parent Teacher Associations, civic and charitable groups, and community decisions, with minority participation being slightly above average. They are average or slightly below average in participating in environmental concerns or public meetings.

5.3 Population Distribution Map (2000)[20]



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/PRSReports.aspx.

6.1 Reported Conservation Progress (2003 – 2007)

PRS Data	FY03	FY04	FY05	FY06	FY07	Avg/Year	Total
Total Conservation Systems Planned (no)	NA	237	274	238	120	217	869
Total Conservation Systems Applied (no)	NA	200	180	253	189	205	822
Conservation Treatment (Units/Acres)							
Access Road (ft)			2,355	1,544		780	3,899
Brush Management (ac)					88	18	88
Comprehensive Nutrient Management Plan (no)	1		3	4	2	2	10
Conservation Completion Incentive First Year (no)					2	*	2
Conservation Crop Rotation (ac)		4,168	4,889	8,059	6,204	4,664	23,320
Contour Buffer Strips (ac)		19			18	7	37
Contour Farming (ac)		836	2,365	3,787	806	1,559	7,794
Cover Crop (ac)		940	2,073	3,015	3,024	1,810	9,052
Critical Area Planting (ac)		10	42	83	40	35	175
Cross Wind Trap Strips (ac)		10		79		18	89
Diversion (ft)		2707	6950	7900		3,511	17,557
Early Successional Habitat Development/Management (ac)				3		1	3
Enhancement - Air Resource Management (ac)				1,066		213	1,066

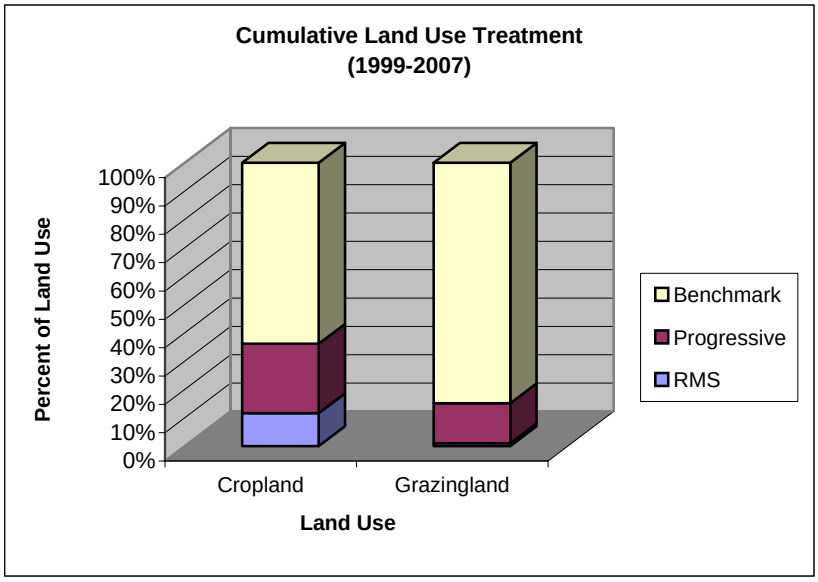
Conservation Treatment (Units/Acres)	FY03	FY04	FY05	FY06	FY07	Avg/Year	Total
Enhancement - Energy Management (ac)				4,190		838	4,190
Enhancement - Habitat Management (ac)				1,778		356	1,778
Enhancement - Pest Management (ac)				2,349		470	2,349
Enhancement - Soil Management (ac)				4,190		838	4,190
Enhancement - Water Management (ac)				565		113	565
Erosion Reduction Applied (ac)	5,431					1,086	5,431
Fence (ft)		49,669	23,298	42,238	8,838	24,809	124,043
Field Border (ft)			13,700	59,958	72,901	29,312	146,559
Filter Strip (ac)			0	0	20	4	20
Forage Harvest Management (ac)		1,648	214	160	523	509	2,545
Grassed Waterway (ac)		18	4	21	35	16	78
Irrigation Water Conveyance, Pipeline, Low-Pressure, Underground, Plastic (ft)				3,240		648	3,240
Irrigation Water Management (ac)		1,081	72	204		271	1,357
Manure Transfer (no)					1	*	1
Mulching (ac)		38	9	51	5	21	103
Nutrient Management (ac)		637	814	1542	5596	1,718	8,589
Pasture and Hay Planting (ac)				144	91	47	235
Pest Management (ac)	1,740	6,603	2,732	2,760	5,653	3,898	19,488
Pipeline (ft)		78,784	48,251	74,831	52,420	50,857	254,286
Pond (no)			1			*	1
Pond Sealing or Lining, Bentonite Sealant (no)				1		*	1
Pond Sealing or Lining, Compacted Clay Treatment (no)				1		*	1
Pond Sealing or Lining, Soil Dispersant (no)		1	4	2	1	2	8
Prescribed Burning (ac)			9		205	43	214
Prescribed Grazing (ac)	19,524	15,414	20,299	16,642	8,965	16,169	80,844
Range Planting (ac)		490	1,570	3,539	1,991	1,518	7,590
Residue and Tillage Management, Mulch Till (ac)					692	138	692
Residue and Tillage Management, No-Till/Strip Till/Direct Seed (ac)					3,478	696	3,478
Residue Management, Mulch Till (ac)		445	2,155	4,759	1,022	1,676	8,381
Residue Management, No-Till/Strip Till (ac)		1744	2726	2907	3914	2,258	11,291
Residue Management, Ridge Till (ac)		240				48	240
Residue Management, Seasonal (ac)		1,875	58	772	105	562	2,810
Restoration and Management of Rare and Declining Habitats (ac)		104	916	744	926	538	2,690
Riparian Forest Buffer (ac)		107	49			31	156
Sediment Basin (no)		1	5	6	5	3	17
Spring Development (no)		2		1	1	1	4
Terrace (ft)		125,882	118,885	259,955	94,538	119,852	599,260
Total Conservation Buffers (ac)	83					17	83
Total Irrigation Water Management (ac)	3,068					614	3,068
Total Nutrient Management (ac)	1,847					369	1,847
Total Waste Management (no)	4					1	4
Total Wildlife Habitat (ac)	6,064					1,213	6,064
Total Residue Management (ac)	1,673					335	1,673
Total Salinity/Alkalinity Control (ac)	2					*	2
Tree/Shrub Establishment) (ac)				4	1	1	5
Underground Outlet (ft)		98	307	3,271	756	886	4,432
Upland Wildlife Habitat Management (ac)		12,120	13,145	6,411	8,346	8,004	40,022
Use Exclusion (ac)		2,055	164	4,748	4,652	3,724	18,619
Waste Storage Facility (no)		1	5	5	2	3	13

Conservation Treatment (Units/Acres)	FY03	FY04	FY05	FY06	FY07	Avg/Year	Total
Waste Utilization (ac)		42	73	337	318	154	770
Water Well (no)		15	22	21	5	13	63
Watering Facility (no)		41	21	33	19	23	114
Well Decommissioning (no)		5				1	5
Wetland Enhancement (ac)			77	28	5	22	110
Wetland Restoration (ac)				17	16	7	33
Wetland Wildlife Habitat Management (ac)			20	42	14	15	76
Wildlife Watering Facility (no)		2	18		2	4	22
Windbreak/Shelterbelt Establishment (ft)		26,016	8,358	15,230	6,130	11,147	55,734

* Less than one.

6.2 Cumulative Conservation Status

Conservation plans developed and applied from 1999 to 2007 are projected in the following graph.



Note:

- *Benchmark (BM) refers to untreated lands within the watershed.*
- *Progressive refers to a resource in which some practices have been implemented, but does not meet established quality criteria.*
- *Resource Management Systems (RMS) refers to a combination of practices that currently meet, or when installed will meet or exceed established quality criteria.*

6.3 Other Watershed Projects

Watershed Projects, Plans, Studies, and Assessments			
NRCS Watershed Plans, Studies, and Assessments[21]		NRCS Watershed Projects	
NAME	STATUS	NAME	STATUS
None	None	None	None
Watershed 319 Projects			
Watershed Restoration and Protection Strategy (WRAPS) – Lower North Fork, Lower South Fork, Upper North Fork and Upper South Fork Solomon Watersheds			

6.4 Lands Applications through Farm Bill Programs[22]

Conservation Reserve Program (CRP) 2007 Expiring Contracts[23]	**46,308 acres**
Conservation Security Program (CSP) 2004-2006	**78,212 acres**
EQIP 2006	**14,621 acres**
EQIP Ground and Surface Water Conservation (GSWC) 2002-2006	**1,510 acres**
Farm and Ranch Lands Protection Program (FRPP)	**None**
Grassland Reserve Program (GRP)	**None**
Wetlands Restoration Program (WRP)	**None**
Wildlife Habitat Incentives Program (WHIP) 2006	**318 acres**

7.0 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 BM and RMS. BM systems are best described as land units that have had no treatment or one or more resource concerns treated with conservation practices. 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. Local resource professionals identified these concerns. 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, 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.

7.1 Cropland

7.1.1 Dryland

Current Conditions	Cultivated / Non-Cultivated*	Dryland	Irrigated	Total	
Total Cropland	572,811	489,513	83,298	572,811	Acres
Cropland Needing Treatment	252,037	215,386	36,651	252,037	Acres
Cropland Currently at RMS Level**	66,446	56,784	9,663	66,446	Acres
Cropland Currently at Progressive Level***	140,339	119,931	20,408	140,339	Acres
Cropland Currently at Untreated Level	366,026	312,799	53,227	366,026	Acres
Typical Cropland-Dryland Management Unit	320				Acres

** 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
BM1		Ac.	312,799			-3	-1	-3	-2
	Conservation Cropping Rotation	Ac.	312,799						
	Conventional Tillage	Ac.	312,799						
BM2			119,931			0	-1	-2	-1
	Conservation Cropping Rotation	Ac.	119,931						
	Crop Residue Use	Ac.	119,931						
	Terrace	Ac.	61,165						
RMS		Ac.	56,784			+1	0	0	+1
	Conservation Cropping Rotation	Ac.	56,784						
	Conservation Tillage	Ac.	56,784						
	Nutrient Management	Ac.	56,784						
	Pest Management	Ac.	56,784						
	Terrace	Ac.	27,824						

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	27%	58,154
	Cropland-Irrigation Conservation System	27%	9,896
		Total	68,050

Estimates:
231,169 Acres needing terraces
215,386 Acres needing treatment
157,232 Acres are not expected to be treated

Future Conditions		Total	BM1	BM2	RMS	RMS1	RMS2	RMS3	RMS4
	Crop - Dryland	489,513	150,993	226,490	56,784	23,843	12,794	9,305	9,305

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.	150,993			-3	-1	-3	-2				
	Conservation Cropping Rotation	Ac.	150,993		$90,596								
	Crop Residue Use	Ac.	150,993		$18,119								
BM2		Ac.	226,490			0	-1	-2	-1				
	Conservation Cropping Rotation	Ac.	226,490		$135,894								
	Crop Residue Use	Ac.	226,490		$27,179								
	Terrace	Ac.	115,510		$2,599								
RMS			56,784			+1	0	0	+1				
(Current RMS)	Conservation Cropping Rotation	Ac.	56,784		$34,070								
	Conservation Tillage	Ac.	56,784		$51,105					X			
	Nutrient Management	Ac.	56,784		$45,427					X			
	Pest Management	Ac.	56,784		$34,070					X			
	Terrace	Ac.	27,824		$626					X			X
RMS1		Ac.	23,843			+2	+3	0	+3				
(Reduce soil erosion using mulch till)	Conservation Cropping Rotation	Ac.	23,843	$143,059	$14,306								
	Crop Residue Use	Ac.	23,843	$143,059	$2,861					X			
RMS2		Ac.	12,794			+4	+4	+2	+3				
(Reduce soil erosion using no till)	Conservation Cropping Rotation	Ac.	12,794	$76,763	$7,676								
	Crop Residue Use	Ac.	12,794	$76,763	$1,535					X			
RMS3		Ac.	12,212			+2	+3	+1	+2				
(Reduce soil erosion by water)	Conservation Cropping Rotation	Ac.	12,212	$73,274	$7,327								
	Crop Residue Use	Ac.	12,212	$73,274	$1,465					X			
	Terrace - Level	Ft.	12,929,592	$11,636,633	$290,916					X			X
RMS4		Ac.	9,305			+4	+4	+2	+3				
(Reduce sheet/rill erosion)	Conservation Cropping Rotation	Ac.	9,305	$55,828	$5,583								
	Crop Residue Use	Ac.	9,305	$55,828	$1,117					X			
	Total RMS Costs			**$12,334,482**	**$772,472**								

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)		$466,314
Operator Investment (25% Cost Share)	$3,083,621	
Federal Costs (75% Cost Share)	$9,250,862	
Total RMS Costs	**$12,334,482**	**$772,472**
Estimated Level of Participation	27%	
Total acres projected to be in RMS System	112,030	
Total Annual Crop Production Benefit	$131,070	

** 2006 Cost List*

Resource Management Systems application estimates provided by District Conservationists.

Beneficial Effects of Proposed RMS System

- Improves soil condition
- Increases soil organic matter
- Improves water quality by reducing erosion and sediment delivery to streams

7.1 Cropland

7.1.2 Irrigated

Current Conditions	Cultivated / Non-Cultivated*	Dryland	Irrigated	Total	
Total Cropland	572,811	489,513	83,298	572,811	Acres
Cropland Needing Treatment	252,037	215,386	36,651	252,037	Acres
Cropland Currently at RMS Level**	66,446	56,784	9,663	66,446	Acres
Cropland Currently at Progressive Level***	140,339	119,931	20,408	140,339	Acres
Cropland Currently at Untreated Level	366,026	312,799	53,227	366,026	Acres
Typical Cropland-Dryland Management Unit	160				Acres

** 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:
	Practices	Unit	Quantity	Investment Cost	Annual O&M Cost	Soil Erosion	Soil Condition	Water Quantity	Water Quality, Surface	
BM1		Ac.	53,227			-3	-1	-3	-2	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).
	Conservation Cropping Rotation	Ac.	53,227							
	Conventional Tillage	Ac.	53,227							
BM2			20,408			0	-1	0	-1	
	Conservation Cropping Rotation	Ac.	20,408							
	Crop Residue Use	Ac.	20,408							
	Irrigation Water Management	Ac.	20,408							
RMS		Ac.	9,663			+2	0	+1	+1	
	Conservation Cropping Rotation	Ac.	9,663							
	Conservation Tillage	Ac.	9,663							
	Nutrient Management	Ac.	9,663							
	Pest Management	Ac.	9,663							
	Irrigation Water Management	Ac.	9,663							

Desired/Estimated Participation Rates

	Proposed Practice Change	Rate	Acres
	Cropland-Dryland Conservation System	27%	58,154
	Cropland-Irrigation Conservation System	27%	9,896
		Total	68,050

Estimates:

36,651 Acres needing treatment

26,755 Acres are not expected to be treated

Future Conditions		Total	BM1	BM2	RMS	RMS1	RMS2	RMS3
	Crop - Irrigated	83,298	25,496	38,244	9,663	4,948	3,167	1,781

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.	25,496			-3	-1	-3	-2				
	Conservation Cropping Rotation	Ac.	25,496		$15,298								
	Crop Residue Use	Ac.	25,496		$3,060								
BM2		Ac.	38,244			0	-1	0	-1				
	Conservation Cropping Rotation	Ac.	38,244		$22,946								
	Crop Residue Use	Ac.	38,244		$4,589								
	Irrigation Water Management	Ac.	38,244		$42,068								
RMS		Ac.	9,663			+2	0	+1	+1				
(Current RMS)	Conservation Cropping Rotation	Ac.	9,663		$5,798								
	Conservation Tillage	Ac.	9,663		$8,696					X			
	Nutrient Management	Ac.	9,663		$7,730					X			
	Pest Management	Ac.	9,663		$5,798					X			
	Irrigation Water Management	Ac.	9,663		$10,629					X			
RMS1		Ac.	4,948			+3	+3	+1	+3				
(Improve irrigation water management)	Conservation Cropping Rotation	Ac.	4,948	$29,687	$2,969								
	Crop Residue Use	Ac.	4,948	$29,687	$594					X			
	Irrigation Water Management	Ac.	4,948	$54,427	$5,443					X			
RMS2		Ac.	3,167			+4	+3	+2	+2				
(convert to pivot system)	Conservation Cropping Rotation	Ac.	3,167	$19,000	$1,900								
	Crop Residue Use	Ac.	3,167	$19,000	$380					X			
	Irrigation Water Management	Ac.	3,167	$34,833	$3,483					X			
	Irrigation System, Sprinkler (conversion)	No.	20	$1,128,121	$5,641					X			X
RMS3		Ac.	3,167			+4	+3	+1	+3				
(Cropping rotation)	Conservation Cropping Rotation	Ac.	3,167	$19,000	$1,900								
	Crop Residue Use	Ac.	3,167	$19,000	$380					X			
	Irrigation Water Management	Ac.	3,167	$34,833	$3,483					X			
	Total RMS Costs			**$1,387,589**	**$152,783**								

7.2.3 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)		$151,457
Operator Investment (25% Cost Share)	$346,897	
Federal Costs (75% Cost Share)	$1,040,692	
Total RMS Costs	**$1,387,589**	**$152,783**
Estimated Level of Participation	27%	
Total acres projected to be in RMS System	19,558	
Total Annual Crop Production Benefit	$15,404	

** 2006 Cost List*

Resource Management Systems application estimates provided by District Conservationists.

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

7.2 Grazed Range

7.2 Native Grassland

Current Conditions	Grazed	Ungrazed	Total	
Total Grazed Range	928,208	0	928,208	Acres
Grazed Range Needing Treatment	593,125	0	593,125	Acres
Total Range with Brush Invasion	46,410	0	46,410	Acres
Cropland Currently at RMS Level**	5,931	0	5,931	Acres
Cropland Currently at Progressive Level***	83,037	0	83,037	Acres
Cropland Currently at Untreated Level	504,156	0	504,156	Acres
Typical Range Management Unit	320			Acres

*** RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.*
**** Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.*
Note: For this analysis, 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.	504,156			-3	-1	-3	-2
	Pond	No.	788						
	Watering Facility	No.	2,363						
	Fence	Mi.	3,151						
BM2		Ac.	83,037			0	+1	+1	+1
	Prescribed Grazing	Ac.	83,037						
	Pond	No.	130						
	Watering Facility	No.	389						
	Pipeline	Ft.	1,042,769						
	Fence	Mi.	778						
RMS		Ac.	5,931			+2	+2	+1	+1
	Brush Management	Ac.	5,931						
	Prescribed Burning	Ac.	5,931						
	Watering Facility	No.	28						
	Pipeline	Ft.	74,484						
	Pond	No.	9						
	Fence	Mi.	56						

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	27%	160,144
	Brush Management	27%	12,531
	Prescribed Burning	27%	160,144

Future Conditions		Total	BM1	BM2	RMS	RMS1	RMS2	RMS3
	Grazed Range	928,208	304,853	457,280	5,931	102,492	33,630	24,022

Future Conditions for Grazed Range

Grazed Range		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.	304,853			-3	-1	-3	-2				
	Pond	No.	476		$57,160								
	Watering Facility	No.	1,429		$65,734								
	Fence	Mi.	2,858		$603,609								
BM2		Ac.	457,280			0	+1	+1	+1				
	Prescribed Grazing	Ac.	457,280		$452,707								
	Pond	No.	714		$85,740								
	Watering Facility	No.	2,143		$98,601								
	Pipeline	Ft.	5,742,434		$103,364								
	Fence	Mi.	4,287		$905,414								
RMS		Ac.	5,931			+2	+2	+1	+1				
(Current RMS)	Brush Management	Ac.	5,931		$8,897								
	Prescribed Burning	Ac.	5,931		$12								
	Watering Facility	No.	28		$1,279								
	Pipeline	Ft.	74,484		$1,341								
	Pond	No.	9		$1,112								
	Fence	Mi.	56		$2								
RMS1		Ac.	102,492			+5	+1	+4	+2				
(Provide adequate wildlife habitat)	Prescribed Grazing	Ac.	102,492	$307,476	$101,467					X			
	Upland Wildlife Habitat Management	Ac.	102,492	$9,224,279	$115,303					X	X		X
	Streambank & Shoreline Protection*	Ft.	248,160	$14,889,600	$297,792					X			
RMS2		Ac.	33,630			+5	+2	+3	+2				
(Wildlife protection)	Brush Management	Ac.	33,630	$1,681,509	$50,445					X	X		
	Prescribed Grazing	Ac.	33,630	$100,891	$33,294					X			
	Upland Wildlife Habitat Management	Ac.	33,630	$3,026,716	$37,834					X	X		X
RMS3		Ac.	24,022			+5	+3	+2	+3				
(Improve forage for livestock)	Brush Management	Ac.	24,022	$1,201,078	$36,032					X	X		
	Prescribed Grazing	Ac.	24,022	$72,065	$23,781					X			
	Total RMS Costs			**$24,421,355**	**$2,899,534**								

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)		$239,615
Operator Investment (25% Cost Share)	$6,105,339	
Federal Costs (75% Cost Share)	$18,316,016	
Total RMS Costs	**$24,421,355**	**$2,899,534**
Estimated Level of Participation	27%	
Total acres projected to be in RMS System	160,144	
Total Annual Forage Production Benefits	$273,209	

** Estimation by KCARE work group (10% of total stream miles need protection)*

*** 2006 Cost List.*

Resource Management Systems application estimates provided by District Conservationists

Beneficial Effects of Proposed RMS System

Improves plant condition, health and vigor

Improves water quality by reducing erosion and sediment delivery to streams

7.3 Pasture

7.3 Non-irrigated Pasture

Current Conditions	Grazed	Ungrazed	Total	
Total Pasture	88,676	0	88,676	Acres
Pasture Needing Treatment	17,558	0	17,558	Acres
Typical Pasture Management Unit	20			Acres

RMS level is a level of treatment that meets or exceeds NRCS quality criteria as defined in the electronic Field Office Technical Guide.
Progressive level defines a management unit that does not have all resource concerns treated to the RMS level.
Note: For this analysis, 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.	17,558			-3	-1	-3	-2	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).
	Pond	No.	27							
	Watering Facility	No.	82							
	Fence	Mi.	658							
BM2		Ac.	71,118			-1	+1	+1	+1	
	Prescribed Grazing	Ac.	71,118							
	Pond	No.	111							
	Watering Facility	No.	333							
	Pipeline	Ft.	893,088							
	Fence	Mi.	2,667							

Desired/Estimated Participation Rates

	Proposed Practice Change	Rate	Acres
	Pasture System	27%	4,741

Future Conditions		Total	BM1	BM2	RMS
	Pasture	88,676	33,574	50,361	4,741

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.	33,574			-3	-1	-3	-2				
	Pond	No.	52		$6,295								
	Water Facility	No.	787		$94,427								
	Fence	Mi.	630		$132,954								
BM2		Ac.	50,361			-1	+1	+1	+1				
	Prescribed Grazing	Ac.	50,361		$49,858								
	Pond	No.	79		$9,443								
	Water Facility	No.	236		$28,328								
	Pipeline	Ft.	632,427		$11,384								
	Fence	Mi.	944		$199,430								
RMS		Ac.	4,741			+3	+2	+1	+2				
(Conversion to pasture)	Pasture and Hay Planting	Ac.	4,741	$284,437	$2,844								
	Prescribed Grazing	Ac.	4,741	$14,222	$4,693					X			
	Fence	Mi.	89	$938,643	$18,773					X			X
	Nutrient Management	Ac.	4,741	$37,925	$3,792					X			
	Pest Management	Ac.	4,741	$28,444	$2,844					X			
	Water Facility	No.	22	$133,330	$2,667					X			X
	Pipeline	Ft.	59,532	$107,157	$1,072					X			X
	Total RMS Costs			**$1,259,720**	**$568,804**								

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)		$11,330
Operator Investment (25% Cost Share)	$314,930	
Federal Costs (75% Cost Share)	$944,790	
Total RMS Costs	**$1,259,720**	**$568,804**
Estimated Level of Participation	27%	
Total acres projected to be in RMS System	4,741	
Total Annual Forage Production Benefits	$18,285	

* 2006 Cost List

Resource Management Systems applications estimates provided by District Conservationists

Beneficial Effects of Proposed RMS System

Improves plant condition, health and vigor

Improves water quality by reducing erosion and sediment delivery to streams

8.0 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.

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