
Resource Concerns – Continued**Harrisonville –**

- Sercia lespedeza is invading the area
- Soil erosion – number 1 problem
- Water quality
- Water quantity – is better now
- Flooding from urban development - floods ruin drainages in bottom lands
- Competition for water between agriculture and urban development
- Urban derived flooding has had detrimental effects on bottom land
- Stream channel augmentation
- Lack of wildlife habitat
- Overabundance of deer and turkey
- Too few quail and rabbits
- On site waste systems are failing
- Invasive wildlife – feral hogs and armadillos
- Storm water management by urban cities
- Urban sprawl into rural areas, primarily in the North
- Stream buffering
- Liability concerns (burning fields) less tolerance
- Rural fire departments are less effective, due to lack of adequate water
- Lack of infrastructure with urban sprawl
- Illegal dumping/ trash/ littering
- Trespass and erosion from ATVs
- Trespassers tear down fences, liability issues if cattle get out
- Lack of acknowledgment of headwaters of the watershed
- County road department does not practice conservation
- County and MoDOT need to do a better job of right-of-way maintenance
- Loose dogs and cats – deplete quail and rabbits
- Overgrazing from too many horses
- Fields are tilled to the road ditch - no buffers
- Contamination from closed mines - acid mine leaching
- When log jam on HWY 18 was removed the Grand River started head cutting several miles up the channel

Rapid Watershed Assessments – Matrix Data

Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best actions to achieve their goals.

The rapid assessment matrix summarizes, in tabular form, current and future resource conditions and their qualitative effect on primary resource concerns. The matrix also summarizes future resource conditions by cost, including: installation, annual operations, initial and annual management, and technical assistance.

The following matrix model was developed from Oregon NRCS, but has been customized to represent Missouri conditions and related economic figures. Input for the model was solicited from district conservationists from each watershed, who identified the resource concerns and typical conservation practice systems installed. As with any modeling effort, it is necessary to make assumptions and generalizations. However, these reports contain estimates from local and experienced field conservationists.

For the South Grand River Watershed, the assessment is comprised of four separate land uses – in the following table, the pages in parenthesis show where the respective assessment summary matrices are located.

Land use characteristics used in Assessment Matrix development.

Land Use	Watershed Total (acres)	Typical Unit Size (acres)	Estimated Participation* (%)
Cropland (p. 47-49)	384,977	40	8
Forestland (p. 50-52)	215,127	10	5
Grassland (p. 53-55)	544,741	55	10
Urban (p. 56-58)	18,881	5	9

* Calculated Participation Rate = Future Treated Acres / (Current Base Acres + Current Progressive Acres)

The assessment matrix for each land use identified is presented as two tables.

Assessment Information – summarizes the practices at each treatment level, the quantities of practices for current benchmark conditions and projected future conditions. It also displays the four major resource concerns along with practice effects and adds a “systems rating” indicating the overall effectiveness of the conservation system used at each level.

Rapid Watershed Assessments Matrix – Continued

Conservation Systems are identified by different conservation practices within **Treatment Levels**, as described below.

Baseline System – represents those landowners who typically are not participating in conservation programs.

Progressive System – is a level of conservation adoption that is leading to a full Resource Management System (RMS).

Resource Management System – is a system of conservation practices that address all the SWPA resource concerns typically seen for this land use in the watershed.

Each table includes the four highest priority **Resource Concerns** that typically must be dealt with for that particular land use in the watershed. Other resource concerns might be identified in the profile, but they will not be identified in the matrix. For each resource concern, a numerical **Practice Effect** rating is identified which is the default rating from the statewide Conservation Practice Physical Effects (CPPE) for both the selected resource concerns and conservation practices. The **System Rating** shown for each conservation system indicates the overall effectiveness of the conservation system used at each treatment level.

Current Conditions and Future Conditions, in terms of units of practices within the respective conservation systems, are shown for current benchmark conditions as well as for projected future conditions for each particular conservation practice that is identified within the resource concerns.

Conservation Investment Information – summarizes the installation, management, operation and maintenance costs, by practice and treatment level, for the projected future conditions by federal and private share of the costs. This table also includes the current benchmark and projected future conditions conservation status bars for the Progressive System and the Resource Management System.

USDA Investment costs are shown for each practice included within the different conservation systems.

Installation Costs are shown at a 50% cost-share rate.

Management Costs are shown for a 3-year period, at a 100% rate.

Technical Assistance Costs are shown at a 20% cost-share rate.

Total Present Value of Costs is the summation of all of the preceding costs, by conservation practice.

Private Investment costs are shown for each practice included within the different conservation systems.

Installation Costs are shown at a 50% cost-share rate.

Annual Operation and Management Costs are shown at a 100% rate.

Total Present Value of Costs is the summation of all of the preceding costs, by conservation practice.



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 1029108			LANDUSE ACRES		384,977	
LANDUSE TYPE		CROPLAND			TYPICAL UNIT SIZE ACRES		40	
ASSESSMENT INFORMATION PART 1					ESTIMATED PARTICIPATION		8%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS			
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Sheet and Rill	Soil Erosion – Classic Gully	Water Quality – Excessive Nutrients and Organics in Surface Water	Plant Condition – Productivity, Health and Vigor
Baseline System	System Rating ->				2	2	2	4
Total Acreage at Baseline Level	57,747	46,197	0	46,197				
Conservation Crop Rotation (ac.) 328	57,747	46,197	0	46,197	4	1	2	4
Grassed Waterway (ac.) 412	2,887	2,310	0	2,310	0	4	2	5
Residue Management, Seasonal (ac.) 344	57,747	46,197	0	46,197	2	1	1	2
Progressive System	System Rating ->				4	3	4	5
Total Acreage at Progressive Level	269,484	256,010	8,662	264,672				
Conservation Crop Rotation (ac.) 328	269,484	264,672	0	264,672	4	1	2	4
Contour Farming (ac.) 330	269,484	256,010	8,662	264,672	3	1	3	1
Diversion (ft.) 362	3,368,549	3,200,121	108,275	3,308,396	1	3	0	2
Field Border (ft.) 386	8,892,969	8,448,320	285,845	8,734,166	4	2	2	4
Filter Strip (ac.) 393	2,695	2,560	87	2,647	3	0	5	4
Grassed Waterway (ac.) 412	13,474	13,234	0	13,234	0	4	2	5
Residue and Tillage Management, Mulch Till (ac.) 345	269,484	256,010	8,662	264,672	0	0	0	0
Residue Management, Seasonal (ac.) 344	269,484	264,672	0	264,672	2	1	1	2



South Grand River - 10290108

8 – Digit Hydrologic Unit Profile and Resource Assessment Matrix



WATERSHED NAME & CODE	SOUTH GRAND RIVER - 1029108				LANDUSE ACRES	384,977		
LANDUSE TYPE	CROPLAND				TYPICAL UNIT SIZE ACRES	40		
ASSESSMENT INFORMATION PART 2					ESTIMATED PARTICIPATION	8%		
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS			
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Sheet and Rill	Soil Erosion – Classic Gully	Water Quality – Excessive Nutrients and Organics in Surface Water	Plant Condition – Productivity, Health and Vigor
Resource Management System (RMS)		System Rating ->			5	5	5	5
Total Acreage at RMS Level		57,747	57,747	16,362	74,108			
Conservation Crop Rotation (ac.) 328	57,747	74,108	0	74,108	4	1	2	4
Contour Buffer Strips (ac.) 332	2,310	2,310	654	2,964	4	1	3	3
Contour Farming (ac.) 330	57,747	71,221	2,887	74,108	3	1	3	1
Cover Crop (ac.) 340	57,747	57,747	16,362	74,108	4	1	2	2
Diversion (ft.) 362	721,832	890,259	36,092	926,351	1	3	0	2
Field Border (ft.) 386	1,905,636	2,350,285	95,282	2,445,566	4	2	2	4
Filter Strip (ac.) 393	577	712	29	741	3	0	5	4
Grade Stabilization Structure (no.) 410	1,444	1,444	409	1,853	0	5	0	0
Grassed Waterway (ac.) 412	2,887	3,705	0	3,705	0	4	2	5
Manure Transfer (no.) 634	1,444	1,444	409	1,853	0	0	3	1
Nutrient Management (ac.) 590	57,747	57,747	16,362	74,108	0	0	5	3
Pest Management (ac.) 595	57,747	57,747	16,362	74,108	0	0	0	5
Residue and Tillage Management, Mulch Till (ac.) 345	57,747	71,221	2,887	74,108	0	0	0	0
Residue and Tillage Management, No-Till/Strip Till/Direct Seed (ac.) 329	57,747	57,747	16,362	74,108	5	1	1	2
Terrace (ft.) 600	8,661,983	8,661,983	2,454,228	11,116,211	5	2	2	2
Upland Wildlife Habitat Management (ac.) 645	6,930	6,930	1,963	8,893	3	2	0	4



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 1029108				LANDUSE ACRES		384,977	
LANDUSE TYPE		CROPLAND				TYPICAL UNIT SIZE ACRES		40	
CONSERVATION INVESTMENT INFORMATION						ESTIMATED PARTICIPATION		8%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	FUTURE	USDA INVESTMENT				PRIVATE INVESTMENT			
	New Treatment Units	Installation Cost 50%	Management Cost - 3 yrs 100%	Technical Assistance 20%	Total Present Value Cost	Installation Cost 50%	Annual O & M + Mgt Costs 100%	Total Present Value Cost	
Progressive System Acres Treated	8661.9825								
Conservation Crop Rotation (ac.) 328	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Contour Farming (ac.) 330	8,662	\$0	\$129,930	\$25,986	\$141,754	\$0	\$43,310	\$66,669	
Diversion (ft.) 362	108,275	\$93,116	\$0	\$18,623	\$111,740	\$93,116	\$3,725	\$108,806	
Field Border (ft.) 386	285,845	\$7,146	\$0	\$1,429	\$8,575	\$7,146	\$286	\$8,350	
Filter Strip (ac.) 393	87	\$3,032	\$0	\$606	\$3,638	\$3,032	\$182	\$3,798	
Grassed Waterway (ac.) 412	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Residue and Tillage Management, Mulch Till (ac.) 345	8,662	\$0	\$259,859	\$51,972	\$283,508	\$0	\$86,620	\$133,338	
Residue Management, Seasonal (ac.) 344	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Subtotal		\$103,294	\$389,789	\$98,617	\$549,215	\$103,294	\$134,122	\$320,962	
Resource Management System (RMS) Acres Treated	16361.5225								
Conservation Crop Rotation (ac.) 328	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Contour Buffer Strips (ac.) 332	654	\$17,690	\$0	\$3,538	\$21,228	\$17,690	\$708	\$20,671	
Contour Farming (ac.) 330	2,887	\$0	\$43,310	\$8,662	\$47,251	\$0	\$14,437	\$22,223	
Cover Crop (ac.) 340	16,362	\$0	\$2,343,788	\$468,758	\$2,557,082	\$0	\$781,263	\$1,202,638	
Diversion (ft.) 362	36,092	\$31,039	\$0	\$6,208	\$37,247	\$31,039	\$1,242	\$36,269	
Field Border (ft.) 386	95,282	\$2,382	\$0	\$476	\$2,858	\$2,382	\$95	\$2,783	
Filter Strip (ac.) 393	29	\$1,011	\$0	\$202	\$1,213	\$1,011	\$61	\$1,266	
Grade Stabilization Structure (no.) 410	409	\$2,081,973	\$0	\$416,395	\$2,498,368	\$2,081,973	\$124,918	\$2,608,175	
Grassed Waterway (ac.) 412	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Manure Transfer (no.) 634	409	\$0	\$27,218,374	\$5,443,675	\$29,695,355	\$0	\$9,072,791	\$13,966,218	
Nutrient Management (ac.) 590	16,362	\$0	\$621,901	\$124,380	\$678,497	\$0	\$207,300	\$319,108	
Pest Management (ac.) 595	16,362	\$0	\$1,047,465	\$209,493	\$1,142,788	\$0	\$349,155	\$537,472	
Residue and Tillage Management, Mulch Till (ac.) 345	2,887	\$0	\$86,620	\$17,324	\$94,503	\$0	\$28,873	\$44,446	
Residue and Tillage Management, No-Till/Strip Till/Direct Seed (ac.) 329	16,362	\$0	\$889,903	\$177,981	\$970,888	\$0	\$296,634	\$456,625	
Terrace (ft.) 600	2,454,228	\$2,515,584	\$0	\$503,117	\$3,018,701	\$2,515,584	\$100,623	\$2,939,446	
Upland Wildlife Habitat Management (ac.) 645	1,963	\$0	\$88,352	\$17,670	\$96,393	\$0	\$29,451	\$45,335	
Subtotal		\$4,649,679	\$32,339,714	\$7,397,878	\$40,862,371	\$4,649,679	\$11,007,551	\$22,202,676	
TOTAL ACRES TREATED / ESTIMATED TREATMENT COSTS	25023.505	\$4,752,973	\$32,729,503	\$7,496,495	\$41,411,585	\$4,752,973	\$11,141,674	\$22,523,637	



South Grand River - 10290108

8 – Digit Hydrologic Unit Profile and Resource Assessment Matrix



WATERSHED NAME & CODE	SOUTH GRAND RIVER - 10290108				LANDUSE ACRES	215,127			
LANDUSE TYPE	FORESTLAND				TYPICAL UNIT SIZE ACRES	10			
ASSESSMENT INFORMATION PART 1					ESTIMATED PARTICIPATION	5%			
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS				
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Streambank	Water Quantity – Insufficient Flows in Watercourses	Plant Condition – Productivity, Health and Vigor	Fish and Wildlife – Inadequate Food	
Baseline System					System Rating ->	0	2	5	4
Total Acreage at Baseline Level		193,614	183,934	0	183,934				
Forest Stand Improvement (ac.) 666	19,361	18,393	0	18,393	0	3	5	3	
Tree/Shrub Establishment (ac.) 612	19,361	18,393	0	18,393	0	2	5	3	
Tree/Shrub Site Preparation (ac.) 490	19,361	18,393	0	18,393	0	0	5	0	
Upland Wildlife Habitat Management (ac.) 645	193,614	183,934	0	183,934	1	1	4	5	
Progressive System					System Rating ->	4	4	5	5
Total Acreage at Progressive Level		19,361	15,489	7,745	23,234				
Brush Management (ac.) 314	968	774	387	1,162	1	3	3	3	
Critical Area Planting (ac.) 342	968	774	387	1,162	4	0	5	2	
Forest Stand Improvement (ac.) 666	9,681	8,519	3,098	11,617	0	3	5	3	
Pest Management (ac.) 595	19,361	15,489	7,745	23,234	0	0	5	3	
Prescribed Forestry (ac.) 409	19,361	15,489	7,745	23,234	5	5	5	3	
Streambank and Shoreline Protection (ft.) 580	968,072	774,457	387,229	1,161,686	4	0	4	2	
Tree/Shrub Establishment (ac.) 612	1,936	2,323	0	2,323	0	2	5	3	
Tree/Shrub Pruning (ac.) 660	1,936	1,549	774	2,323	0	0	5	1	
Tree/Shrub Site Preparation (ac.) 490	1,936	2,323	0	2,323	0	0	5	0	
Upland Wildlife Habitat Management (ac.) 645	19,361	23,234	0	23,234	1	1	4	5	



South Grand River - 10290108

8 – Digit Hydrologic Unit Profile and Resource Assessment Matrix



WATERSHED NAME & CODE	SOUTH GRAND RIVER - 10290108				LANDUSE ACRES	215,127			
LANDUSE TYPE	FORESTLAND				TYPICAL UNIT SIZE ACRES	10			
ASSESSMENT INFORMATION PART 2					ESTIMATED PARTICIPATION	5%			
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS				
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Streambank	Water Quantity – Insufficient Flows in Watercourses	Plant Condition – Productivity, Health and Vigor	Fish and Wildlife – Inadequate Food	
Resource Management System (RMS)	System Rating ->				4	3	5	5	
Total Acreage at RMS Level	2,151	2,151	3,872	6,024					
Brush Management (ac.) 314	108	204	97	301	1	3	3	3	
Critical Area Planting (ac.) 342	108	204	97	301	4	0	5	2	
Forest Stand Improvement (ac.) 666	1,936	3,098	2,323	5,421	0	3	5	3	
Forest Trails and Landings (ac.) 655	108	108	194	301	0	0	2	1	
Pest Management (ac.) 595	2,151	4,087	1,936	6,024	0	0	5	3	
Prescribed Forestry (ac.) 409	2,151	4,087	1,936	6,024	5	5	5	3	
Shallow Water Management for Wildlife (ac.) 646	11	11	19	30	0	0	3	4	
Streambank and Shoreline Protection (ft.) 580	107,564	204,371	96,807	301,178	4	0	4	2	
Tree/Shrub Establishment (ac.) 612	215	602	0	602	0	2	5	3	
Tree/Shrub Pruning (ac.) 660	215	409	194	602	0	0	5	1	
Tree/Shrub Site Preparation (ac.) 490	215	602	0	602	0	0	5	0	
Upland Wildlife Habitat Management (ac.) 645	2,151	6,024	0	6,024	1	1	4	5	
Use Exclusion (ac.) 472	2,108	2,108	3,795	5,903	2	2	4	3	
Wetland Restoration (ac.) 657	215	215	387	602	0	0	4	5	
Windbreak/Shelterbelt Establishment (ft.) 380	107,564	107,564	193,614	301,178	0	-2	5	4	



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 10290108				LANDUSE ACRES		215,127	
LANDUSE TYPE		FORESTLAND				TYPICAL UNIT SIZE ACRES		10	
CONSERVATION INVESTMENT INFORMATION						ESTIMATED PARTICIPATION		5%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS		FUTURE	USDA INVESTMENT				PRIVATE INVESTMENT		
		New Treatment Units	Installation Cost 50%	Management Cost - 3 yrs 100%	Technical Assistance 20%	Total Present Value Cost	Installation Cost 50%	Annual O & M + Mgt Costs 100%	Total Present Value Cost
Progressive System Acres Treated		7744.572							
Brush Management (ac.) 314		387	\$17,172	\$0	\$3,434	\$20,606	\$17,172	\$343	\$18,618
Critical Area Planting (ac.) 342		387	\$92,195	\$0	\$18,439	\$110,634	\$92,195	\$1,844	\$99,962
Forest Stand Improvement (ac.) 666		3,098	\$138,674	\$0	\$27,735	\$166,409	\$138,674	\$2,773	\$150,357
Pest Management (ac.) 595		7,745	\$0	\$495,807	\$99,161	\$540,928	\$0	\$165,269	\$254,407
Prescribed Forestry (ac.) 409		7,745	\$193,614	\$0	\$38,723	\$232,337	\$193,614	\$0	\$193,614
Streambank and Shoreline Protection (ft.) 580		387,229	\$2,112,332	\$0	\$422,466	\$2,534,798	\$2,112,332	\$84,493	\$2,468,248
Tree/Shrub Establishment (ac.) 612		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tree/Shrub Pruning (ac.) 660		774	\$87,126	\$0	\$17,425	\$104,552	\$87,126	\$3,485	\$101,807
Tree/Shrub Site Preparation (ac.) 490		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Upland Wildlife Habitat Management (ac.) 645		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal			\$2,641,114	\$495,807	\$627,384	\$3,710,265	\$2,641,114	\$258,208	\$3,287,015
Resource Management System (RMS) Acres Treated		3872.286							
Brush Management (ac.) 314		97	\$4,293	\$0	\$859	\$5,151	\$4,293	\$86	\$4,655
Critical Area Planting (ac.) 342		97	\$23,049	\$0	\$4,610	\$27,659	\$23,049	\$461	\$24,991
Forest Stand Improvement (ac.) 666		2,323	\$104,006	\$0	\$20,801	\$124,807	\$104,006	\$2,080	\$112,768
Forest Trails and Landings (ac.) 655		194	\$115,349	\$0	\$23,070	\$138,418	\$115,349	\$4,614	\$134,784
Pest Management (ac.) 595		1,936	\$0	\$123,952	\$24,790	\$135,232	\$0	\$41,317	\$63,602
Prescribed Forestry (ac.) 409		1,936	\$48,404	\$0	\$9,681	\$58,084	\$48,404	\$0	\$48,404
Shallow Water Management for Wildlife (ac.) 646		19	\$97	\$0	\$19	\$116	\$97	\$0	\$97
Streambank and Shoreline Protection (ft.) 580		96,807	\$528,083	\$0	\$105,617	\$633,700	\$528,083	\$21,123	\$617,062
Tree/Shrub Establishment (ac.) 612		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tree/Shrub Pruning (ac.) 660		194	\$21,782	\$0	\$4,356	\$26,138	\$21,782	\$871	\$25,452
Tree/Shrub Site Preparation (ac.) 490		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Upland Wildlife Habitat Management (ac.) 645		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Use Exclusion (ac.) 472		3,795	\$9,487	\$0	\$1,897	\$11,385	\$9,487	\$569	\$11,885
Wetland Restoration (ac.) 657		387	\$58,084	\$0	\$11,617	\$69,701	\$58,084	\$1,162	\$62,978
Windbreak/Shelterbelt Establishment (ft.) 380		193,614	\$43,563	\$0	\$8,713	\$52,276	\$43,563	\$1,743	\$50,903
Subtotal			\$956,196	\$123,952	\$216,030	\$1,282,667	\$956,196	\$74,026	\$1,157,579
TOTAL ACRES TREATED / ESTIMATED TREATMENT COSTS		11616.858	\$3,597,310	\$619,759	\$843,414	\$4,992,932	\$3,597,310	\$332,235	\$4,444,594



South Grand River - 10290108

8 – Digit Hydrologic Unit Profile and Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 10290108			LANDUSE ACRES		544,741	
LANDUSE TYPE		GRASSLAND			TYPICAL UNIT SIZE ACRES		55	
ASSESSMENT INFORMATION PART 1					ESTIMATED PARTICIPATION		10%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS			
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Classic Gully	Soil Erosion – Streambank	Plant Condition – Productivity, Health and Vigor	Domestic Animals – Inadequate Quantities and Quality of Feed and Forage
Baseline System		System Rating ->			2	0	4	4
Total Acreage at Baseline Level		190,659	162,060	0	162,060			
Fence (ft.) 382	20,799,202	17,679,322	0	17,679,322	0	0	0	0
Forage Harvest Management (ac.) 511	190,659	162,060	0	162,060	0	0	4	4
Pasture and Hay Planting (ac.) 512	190,659	162,060	0	162,060	1	0	5	5
Pipeline (ft.) 516	3,466,534	2,946,554	0	2,946,554	0	0	2	0
Pond (no.) 378	3,467	2,947	0	2,947	4	1	2	0
Progressive System		System Rating ->			3	3	5	5
Total Acreage at Progressive Level		217,896	196,107	19,066	215,173			
Brush Management (ac.) 314	32,684	29,416	2,860	32,276	3	1	3	4
Fence (ft.) 382	35,655,775	34,170,117	1,039,960	35,210,077	0	0	0	0
Forage Harvest Management (ac.) 511	217,896	215,173	0	215,173	0	0	4	4
Pasture and Hay Planting (ac.) 512	217,896	215,173	0	215,173	1	0	5	5
Pipeline (ft.) 516	7,923,505	7,477,808	346,653	7,824,462	0	0	2	0
Pond (no.) 378	3,962	3,912	0	3,912	4	1	2	0
Upland Wildlife Habitat Management (ac.) 645	21,790	19,611	1,907	21,517	2	1	4	2
Use Exclusion (ac.) 472	26,148	23,533	2,288	25,821	2	2	4	4
Watering Facility (no.) 614	3,962	3,566	347	3,912	1	4	2	3



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 10290108			LANDUSE ACRES		544,741	
LANDUSE TYPE		GRASSLAND			TYPICAL UNIT SIZE ACRES		55	
ASSESSMENT INFORMATION PART 2					ESTIMATED PARTICIPATION		10%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS			
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Classic Gully	Soil Erosion – Streambank	Plant Condition – Productivity, Health and Vigor	Domestic Animals – Inadequate Quantities and Quality of Feed and Forage
Resource Management System (RMS)	System Rating ->				3	4	5	5
Total Acreage at RMS Level	136,185	136,185	20,428	156,613				
Brush Management (ac.) 314	13,619	14,708	953	15,661	3	1	3	4
Fence (ft.) 382	28,475,098	31,297,847	1,448,516	32,746,362	0	0	0	0
Forage Harvest Management (ac.) 511	122,567	140,952	0	140,952	0	0	4	4
Nutrient Management (ac.) 590	122,567	122,567	18,385	140,952	0	0	3	4
Pasture and Hay Planting (ac.) 512	122,567	140,952	0	140,952	1	0	5	5
Pest Management (ac.) 595	136,185	136,185	20,428	156,613	0	0	5	4
Pipeline (ft.) 516	6,561,653	7,131,155	414,746	7,545,901	0	0	2	0
Pond (no.) 378	2,476	2,848	0	2,848	4	1	2	0
Prescribed Grazing (ac.) 528	122,567	122,567	18,385	140,952	2	3	5	5
Riparian Forest Buffer (ac.) 391	13,619	13,619	2,043	15,661	3	4	4	0
Streambank and Shoreline Protection (ft.) 580	1,238,048	1,238,048	185,707	1,423,755	0	4	4	1
Tree/Shrub Establishment (ac.) 612	13,619	13,619	2,043	15,661	2	0	5	2
Tree/Shrub Site Preparation (ac.) 490	13,619	13,619	2,043	15,661	-2	0	5	0
Upland Wildlife Habitat Management (ac.) 645	13,619	14,708	953	15,661	2	1	4	2
Use Exclusion (ac.) 472	16,342	17,650	1,144	18,794	2	2	4	4
Water Well (no.) 642	2,476	2,476	371	2,848	0	0	1	2
Watering Facility (no.) 614	2,476	2,674	173	2,848	1	4	2	3



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 10290108				LANDUSE ACRES		544,741	
LANDUSE TYPE		GRASSLAND				TYPICAL UNIT SIZE ACRES		55	
CONSERVATION INVESTMENT INFORMATION						ESTIMATED PARTICIPATION		10%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	FUTURE	USDA INVESTMENT			Total Present Value Cost	PRIVATE INVESTMENT			
	New Treatment Units	Installation Cost 50%	Management Cost - 3 yrs 100%	Technical Assistance 20%		Installation Cost 50%	Annual O & M + Mgt Costs 100%	Total Present Value Cost	
Progressive System Acres Treated	19065.935								
Brush Management (ac.) 314	2,860	\$126,822	\$0	\$25,364	\$152,186	\$126,822	\$2,536	\$137,506	
Fence (ft.) 382	1,039,960	\$759,171	\$0	\$151,834	\$911,005	\$759,171	\$75,917	\$1,078,961	
Forage Harvest Management (ac.) 511	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Pasture and Hay Planting (ac.) 512	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Pipeline (ft.) 516	346,653	\$372,652	\$0	\$74,530	\$447,183	\$372,652	\$0	\$372,652	
Pond (no.) 378	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Upland Wildlife Habitat Management (ac.) 645	1,907	\$0	\$85,797	\$17,159	\$93,605	\$0	\$28,599	\$44,024	
Use Exclusion (ac.) 472	2,288	\$5,720	\$0	\$1,144	\$6,864	\$5,720	\$343	\$7,165	
Watering Facility (no.) 614	347	\$157,445	\$0	\$31,489	\$188,934	\$157,445	\$6,298	\$183,973	
	Subtotal	\$1,421,810	\$85,797	\$301,521	\$1,799,776	\$1,421,810	\$113,693	\$1,824,282	
Resource Management System (RMS) Acres Treated	20427.7875								
Brush Management (ac.) 314	953	\$42,274	\$0	\$8,455	\$50,729	\$42,274	\$845	\$45,835	
Fence (ft.) 382	1,448,516	\$1,057,417	\$0	\$211,483	\$1,268,900	\$1,057,417	\$105,742	\$1,502,839	
Forage Harvest Management (ac.) 511	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Nutrient Management (ac.) 590	18,385	\$0	\$698,814	\$139,763	\$762,409	\$0	\$232,938	\$358,574	
Pasture and Hay Planting (ac.) 512	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Pest Management (ac.) 595	20,428	\$0	\$1,307,787	\$261,557	\$1,426,801	\$0	\$435,929	\$671,048	
Pipeline (ft.) 516	414,746	\$445,852	\$0	\$89,170	\$535,022	\$445,852	\$0	\$445,852	
Pond (no.) 378	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Prescribed Grazing (ac.) 528	18,385	\$80,894	\$0	\$16,179	\$97,073	\$80,894	\$0	\$80,894	
Riparian Forest Buffer (ac.) 391	2,043	\$332,973	\$0	\$66,595	\$399,568	\$332,973	\$6,659	\$361,025	
Streambank and Shoreline Protection (ft.) 580	185,707	\$1,013,033	\$0	\$202,607	\$1,215,639	\$1,013,033	\$40,521	\$1,183,723	
Tree/Shrub Establishment (ac.) 612	2,043	\$332,973	\$0	\$66,595	\$399,568	\$332,973	\$0	\$332,973	
Tree/Shrub Site Preparation (ac.) 490	2,043	\$0	\$274,488	\$54,898	\$299,468	\$0	\$91,496	\$140,845	
Upland Wildlife Habitat Management (ac.) 645	953	\$0	\$42,898	\$8,580	\$46,802	\$0	\$14,299	\$22,012	
Use Exclusion (ac.) 472	1,144	\$2,860	\$0	\$572	\$3,432	\$2,860	\$172	\$3,583	
Water Well (no.) 642	371	\$555,569	\$0	\$111,114	\$666,683	\$555,569	\$22,223	\$649,179	
Watering Facility (no.) 614	173	\$78,722	\$0	\$15,744	\$94,467	\$78,722	\$3,149	\$91,987	
	Subtotal	\$3,942,566	\$2,323,988	\$1,253,311	\$7,266,559	\$3,942,566	\$953,974	\$5,890,368	
TOTAL ACRES TREATED / ESTIMATED TREATMENT COSTS	39493.7225	\$5,364,376	\$2,409,784	\$1,554,832	\$9,066,335	\$5,364,376	\$1,067,667	\$7,714,651	



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



		SOUTH GRAND RIVER - 10290108			LANDUSE ACRES		18,881	
LANDUSE TYPE		HIGH AND LOW INTENSITY URBAN			TYPICAL UNIT SIZE ACRES		5	
ASSESSMENT INFORMATION PART 1					ESTIMATED PARTICIPATION		9%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS			
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Mass Movement	Water Quantity – Excessive Runoff, Flooding, or Ponding	Water Quality – Excessive Nutrients and Organics in Surface Water	Water Quality – Excessive Suspended Sediment and Turbidity in Surface Water
Baseline System		System Rating ->			#N/A	0	1	3
Total Acreage at Baseline Level		16,993	15,294	0	15,294			
Critical Area Planting (ac.) 342	850	765	0	765	#N/A	0	2	4
Fence (ft.) 382	4,418,154	3,976,339	0	3,976,339	#N/A	0	0	0
Tree/Shrub Establishment (ac.) 612	850	765	0	765	#N/A	-1	2	4
Progressive System		System Rating ->			#N/A	1	2	4
Total Acreage at Progressive Level		1,699	1,529	1,359	2,889			
Critical Area Planting (ac.) 342	85	144	0	144	#N/A	0	2	4
Fence (ft.) 382	441,815	751,086	0	751,086	#N/A	0	0	0
Grade Stabilization Structure (no.) 410	340	306	272	578	#N/A	0	0	2
Mulching (ac.) 484	170	153	136	289	#N/A	2	2	2
Pipeline (ft.) 516	84,965	76,468	67,972	144,440	#N/A	0	0	0
Tree/Shrub Establishment (ac.) 612	127	183	34	217	#N/A	-1	2	4
Upland Wildlife Habitat Management (ac.) 645	680	612	544	1,156	#N/A	1	0	2
Watering Facility (no.) 614	340	306	272	578	#N/A	0	0	2
Windbreak/Shelterbelt Establishment (ft.) 380	169,929	152,936	135,943	288,879	#N/A	1	1	2



South Grand River - 10290108
 8 – Digit Hydrologic Unit Profile and
 Resource Assessment Matrix



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 10290108			LANDUSE ACRES		18,881	
LANDUSE TYPE		HIGH AND LOW INTENSITY URBAN			TYPICAL UNIT SIZE ACRES		5	
ASSESSMENT INFORMATION PART 2					ESTIMATED PARTICIPATION		9%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS	CURRENT CONDITIONS	FUTURE CONDITIONS			RESOURCE CONCERNS			
	Total Units	Existing Unchanged Units	New Treatment Units	Total Units	Soil Erosion – Mass Movement	Water Quantity – Excessive Runoff, Flooding, or Ponding	Water Quality – Excessive Nutrients and Organics in Surface Water	Water Quality – Excessive Suspended Sediment and Turbidity in Surface Water
Resource Management System (RMS)	System Rating ->				#N/A	1	4	4
Total Acreage at RMS Level	189	189	374	563				
Conservation Cover (ac.) 327	9	9	19	28	#N/A	2	2	3
Critical Area Planting (ac.) 342	9	28	0	28	#N/A	0	2	4
Fence (ft.) 382	60,419	157,619	22,431	180,049	#N/A	0	0	0
Grade Stabilization Structure (no.) 410	38	45	68	113	#N/A	0	0	2
Mulching (ac.) 484	28	32	53	84	#N/A	2	2	2
Nutrient Management (ac.) 590	179	179	355	535	#N/A	0	5	0
Pest Management (ac.) 595	179	179	355	535	#N/A	0	0	2
Pipeline (ft.) 516	9,441	11,140	16,993	28,133	#N/A	0	0	0
Tree/Shrub Establishment (ac.) 612	14	34	8	42	#N/A	-1	2	4
Upland Wildlife Habitat Management (ac.) 645	151	165	285	450	#N/A	1	0	2
Watering Facility (no.) 614	38	45	68	113	#N/A	0	0	2
Windbreak/Shelterbelt Establishment (ft.) 380	37,762	41,161	71,370	112,531	#N/A	1	1	2



South Grand River - 10290108

*8 – Digit Hydrologic Unit Profile and
Resource Assessment Matrix*



WATERSHED NAME & CODE		SOUTH GRAND RIVER - 10290108				LANDUSE ACRES		18,881	
LANDUSE TYPE		HIGH AND LOW INTENSITY URBAN				TYPICAL UNIT SIZE ACRES		5	
CONSERVATION INVESTMENT INFORMATION						ESTIMATED PARTICIPATION		9%	
CONSERVATION SYSTEMS BY TREATMENT LEVELS		FUTURE	USDA INVESTMENT			PRIVATE INVESTMENT			
		New Treatment Units	Installation Cost 50%	Management Cost - 3 yrs 100%	Technical Assistance 20%	Total Present Value Cost	Installation Cost 50%	Annual O & M + Mgt Costs 100%	Total Present Value Cost
Progressive System Acres Treated		1359.432							
Critical Area Planting (ac.) 342		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fence (ft.) 382		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Grade Stabilization Structure (no.) 410		272	\$1,383,881	\$0	\$276,776	\$1,660,658	\$1,383,881	\$83,033	\$1,733,646
Mulching (ac.) 484		136	\$0	\$40,783	\$8,157	\$44,494	\$0	\$13,594	\$20,926
Pipeline (ft.) 516		67,972	\$73,069	\$0	\$14,614	\$87,683	\$73,069	\$0	\$73,069
Tree/Shrub Establishment (ac.) 612		34	\$5,540	\$0	\$1,108	\$6,648	\$5,540	\$0	\$5,540
Upland Wildlife Habitat Management (ac.) 645		544	\$0	\$24,470	\$4,894	\$26,697	\$0	\$8,157	\$12,556
Watering Facility (no.) 614		272	\$123,487	\$0	\$24,697	\$148,184	\$123,487	\$4,939	\$144,294
Windbreak/Shelterbelt Establishment (ft.) 380		135,943	\$30,587	\$0	\$6,117	\$36,705	\$30,587	\$1,223	\$35,741
		Subtotal	\$1,616,564	\$65,253	\$336,363	\$2,011,068	\$1,616,564	\$110,947	\$2,025,772
Resource Management System (RMS) Acres Treated		373.8438							
Conservation Cover (ac.) 327		19	\$1,183	\$0	\$237	\$1,419	\$1,183	\$24	\$1,282
Critical Area Planting (ac.) 342		0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fence (ft.) 382		22,431	\$16,374	\$0	\$3,275	\$19,649	\$16,374	\$1,637	\$23,272
Grade Stabilization Structure (no.) 410		68	\$345,970	\$0	\$69,194	\$415,164	\$345,970	\$20,758	\$433,412
Mulching (ac.) 484		53	\$0	\$15,803	\$3,161	\$17,242	\$0	\$5,268	\$8,109
Nutrient Management (ac.) 590		355	\$0	\$13,499	\$2,700	\$14,728	\$0	\$4,500	\$6,927
Pest Management (ac.) 595		355	\$0	\$22,737	\$4,547	\$24,806	\$0	\$7,579	\$11,667
Pipeline (ft.) 516		16,993	\$18,267	\$0	\$3,653	\$21,921	\$18,267	\$0	\$18,267
Tree/Shrub Establishment (ac.) 612		8	\$1,385	\$0	\$277	\$1,662	\$1,385	\$0	\$1,385
Upland Wildlife Habitat Management (ac.) 645		285	\$0	\$12,847	\$2,569	\$14,016	\$0	\$4,282	\$6,592
Watering Facility (no.) 614		68	\$30,872	\$0	\$6,174	\$37,046	\$30,872	\$1,235	\$36,073
Windbreak/Shelterbelt Establishment (ft.) 380		71,370	\$16,058	\$0	\$3,212	\$19,270	\$16,058	\$642	\$18,764
		Subtotal	\$430,110	\$64,886	\$98,999	\$586,923	\$430,110	\$45,925	\$565,750
TOTAL ACRES TREATED / ESTIMATED TREATMENT COSTS		1733.2758	\$2,046,674	\$130,139	\$435,363	\$2,597,991	\$2,046,674	\$156,872	\$2,591,522

Footnotes / Bibliography

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

Some data that was provided was given for areas that do not match up perfectly with the watershed. For these areas, such as county wide and census data, figures were adjusted by percent of the HUC in the area.

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Base Layer Map

Digital Elevation Model of Missouri. Map Layer. Center for Applied Research and Environmental Systems (CARES), 2005.
Public Land Survey. Map Layer. CARES, 2005.
Hydrologic Unit Code (HUC). Map Layer. Natural Resources Conservation Service (NRCS), 2006.
National Hydrology Dataset (NHD). Map Layer. U.S. Geologic Survey (USGS), 2005.
Roads and Highways. Map Layer. Missouri Department of Transportation (MoDOT), 2005.
Railroads. Map Layer. Federal Railroad Administration, 2003.
Political Boundaries. Map Layer. U.S. Census Bureau, 2001.
Public Lands. Map Layer. Missouri Resource Assessment Partnership (MoRAP), 2003.

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Relief Map:

Digital Elevation Model of Missouri. Map Layer. CARES, 2005.
Hillshade Relief Map of Missouri. Map Layer. CARES, 2005.

Page 7

Karst Features Map:

Springs, Sink Areas, and Losing/Gaining Streams. Map Layer. Missouri Department of Natural Resources (MoDNR), 2006.
Data Downloaded from: <http://www.msdis.missouri.edu/datasearch/ThemeList.jsp>
Sinkholes. Map Layer. CARES from various sources, 2006.

Page 8

Geologic Features Map:

Missouri Bedrock Geology. Map Layer. MoDNR, division of Geology and Land Survey-Geological Survey Program, 2006.
Missouri Fault Geology. Map Layer. MoDNR, division of Geology and Land Survey-Geological Survey Program, 2006.
Generalized Kansas Bedrock Geology. Map Layer. Kansas Geological Survey, 1992.
Data downloaded from: <http://www.kansasgis.org>

Pages 10-11

Common Resource Area Map / Descriptions:

Common Resource Areas. Map Layer. NRCS, 2006.
Common Resource Areas. Descriptions. NRCS, 2006.
Descriptions downloaded from the NRCS online Electronic Field Guide (eFOTG) at:
http://efotg.nrcs.usda.gov/references/public/MO/CRA_descriptions.pdf

Pages 12-14

Major Land Resource Area Map / Descriptions:

Major Land Resource Areas. Map Layer. NRCS, 2006.
Major Land Resource Areas. Descriptions. NRCS, 1981.
Descriptions downloaded from: <http://www.soilsurvey.org/maps/mlra.asp>

Footnotes / Bibliography – Continued**Page 15**

Annual Precipitation Map:

Annual Precipitation. Map Layer. PRISM Group at Oregon State University, 2006.**Page 16**

Land Ownership Map:

Public Lands. Map Layer. MoRAP, 2003.**Page 17**

Land Slope Map:

Land Slope. Map layer. CARES, 2005.

Created from the CARES 10 Meter DEM.

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Land Use / Land Cover Map:

2005 Land Use Land Cover. Map Layer. MoRAP, 2005.**Page 19**

Land Use / Land Cover Pie Chart:

2005 Land Use Land Cover. Database. MoRAP, 2005.

Land Use / Land Cover Graph:

2005 Land Use Land Cover. Database. MoRAP, 2005.

Data was collected by using Public Land (MoRAP, 2003) to clip Land Use / Land Cover. This gave both public and private land areas that could be queried by type.

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Land Capability Class Graph:

Soils GIS Data. Database. NRCS.Served by Missouri Cooperative Soil Survey at: <http://www.soilsurvey.org>Missouri Land Capability Classes. Descriptions. NRCS.Descriptions downloaded from <http://soils.usda.gov/technical/handbook/contents/part622.html>Kansas Land Capability Classes. Database. NRCS.

Data queried from NRCS Soil Data Mart at:

<http://soildatamart.nrcs.usda.gov/County.aspx?State=KS>**Page 21**

Riparian Corridor Map:

Riparian Corridor. Map Layer. NRCS.**Page 23**

Highly Erodible Lands Map:

Soils GIS Data. Map Layer. NRCS.

Data queried from NRCS Soil data being served by the Missouri Cooperative Soil Survey at

<http://www.soilsurvey.org>Kansas Highly Erodible Land. Map Layer. NRCS.

Data queried from NRCS Soil Data Mart at:

<http://soildatamart.nrcs.usda.gov/County.aspx?State=KS>

Footnotes / Bibliography – Continued**Page 24**

Prime Farmlands Map:

Soils GIS Data. Map Layer. NRCS.

Data queried from NRCS Soil data being served by the Missouri Cooperative Soil Survey at:

<http://www.soilsurvey.org>

Kansas Highly Erodible Land. Map Layer. NRCS.

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<http://soildatamart.nrcs.usda.gov/County.aspx?State=KS>

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Census Data by Block Map:

2000 U.S. Census Tiger Lines. Map Layer. U.S. Census Bureau, 2001.

2000 U.S. Census Data. Database. U.S. Census Bureau, 2001.

Data queried from SF1-A databases.

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Census Data by Block Maps:

2000 U.S. Census Tiger Lines. Map Layer. U.S. Census Bureau, 2001.

2000 U.S. Census Data. Database. U.S. Census Bureau, 2001.

Data queried from SF1-A databases

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Age Demographics Pie Chart:

2000 U.S. Census Data. Database. U.S. Census Bureau, 2001.

Data queried from SF1-B databases.

Income Sources Graph:

2000 U.S. Census Data. Database. U.S. Census Bureau, 2001.

Data queried from SF3-O databases.

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Employment Figures Map:

2000 U.S. Census Data. Map Layer and Database. U.S. Census Bureau, 2001.

Data queried from SF3-M databases.

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Confined Animal Feeding Operation Map:

Confined Animal Feeding Operations. Map Layer and Database. NRCS, 2006.

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Animal Units Definitions:

NPDES Permitting of CAFOs in Missouri. Definitions. MoDNR, 2004.

Definitions found at: http://www.dnr.mo.gov/env/wpp/cafo/npdes_permitting_cafos.pdf

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Required Setbacks for Missouri. Database. MoDNR.

Ordinances are based on guidelines produced by the Water Protection Program, and can be found at: <http://agebb.missouri.edu/commag/permit/setbacks.asp>

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Facility Additional Setback Graph:

Local Restrictions. Database. MoDNR.

Ordinances produced by individual counties, and go beyond what MoDNR requires. Information can be found at: <http://agebb.missouri.edu/commag/permit/restrictions.asp>

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Solid Waste and Wastewater Facilities Map:

Landfills. Map Layer. MoDNR, 2004.

Hazardous Waste Program-Permits. Map Layer. MoDNR, 2004.

Wastewater Facilities. Map Layer. MoDNR, 2006.

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Hazardous Waste Generators. Map Layer. MoDNR, 2007.

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Ground Water Graph:

Ground Water for 8 Digit HUC (GWHU8). Database. Census of Missouri Public Water Systems, 2007.

Surface Water Graph:

Surface Water for 8 Digit HUC (SWHU8). Database. Census of Missouri Public Water Systems, 2007.

Page 36

Endangered and Threatened Species Graph:

Species and Natural Communities of Conservation Concern. Database. Missouri National Heritage Program, 2007.

Online linkage can be found here: <http://mdc.mo.gov/nathis/heritage>

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Stream Flow Data Graph:

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Gage station information can be found here: <http://waterdata.usgs.gov/mo/nwis/sw>

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303(d) Listed Streams and Water Map:

Missouri 2002 303(d) Listed Waters. Map Layer. MoDNR, 2002.

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Rapid Watershed Assessment Matrix Data Tables:

Database. NRCS, 2008.