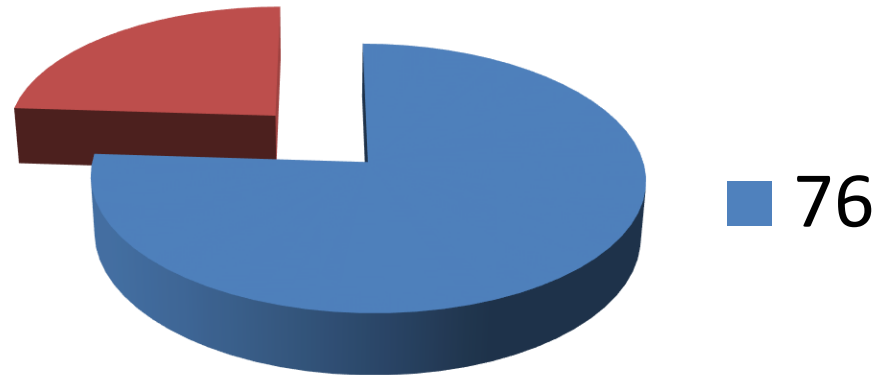


Kansas Watershed Restoration and Protection Strategy (KS WRAPS)

Amanda Reed

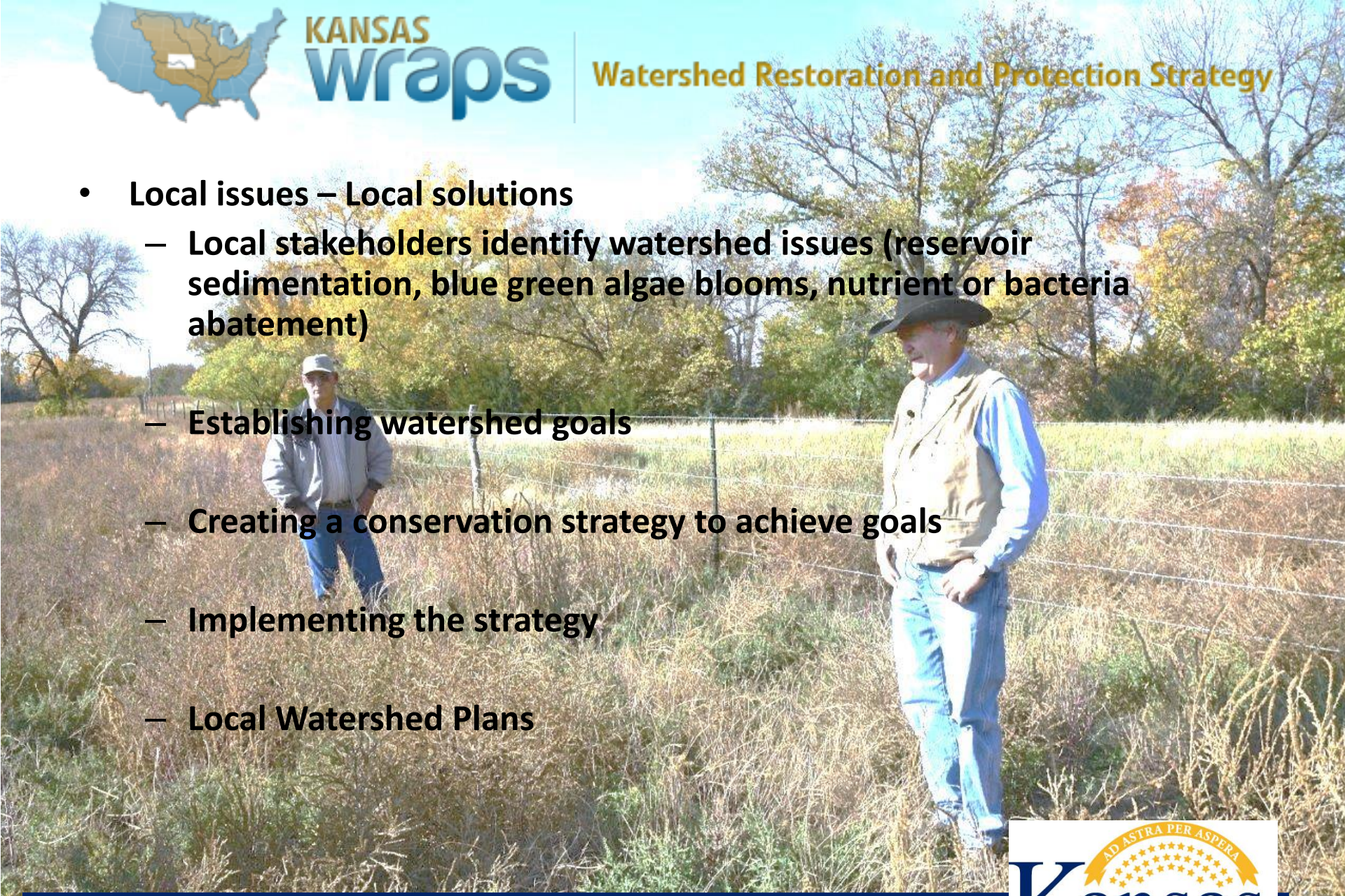
- Nonpoint Source Pollution: any activity that is not required to have a national pollutant discharge elimination system permit and that results in the release of pollutants to waters of the state. This release may result from precipitation runoff, aerial drift and deposition from the air, or the release of subsurface briner or other contaminated groundwater's to surface waters of the state.” – KAR 28-16-28b
- 76% of the impaired water bodies in the United States are contaminated from nonpoint sources of pollution. **It is the #1 water quality problem in the country.**
- Primary contaminants of concern in Kansas include sediment, nutrients, bacteria.



Purpose is to protect and restore Kansas watersheds

- **Restore / Protect quality of drinking water**
- **Preserve the life of federal reservoirs**
- **Improve aquatic ecosystems**

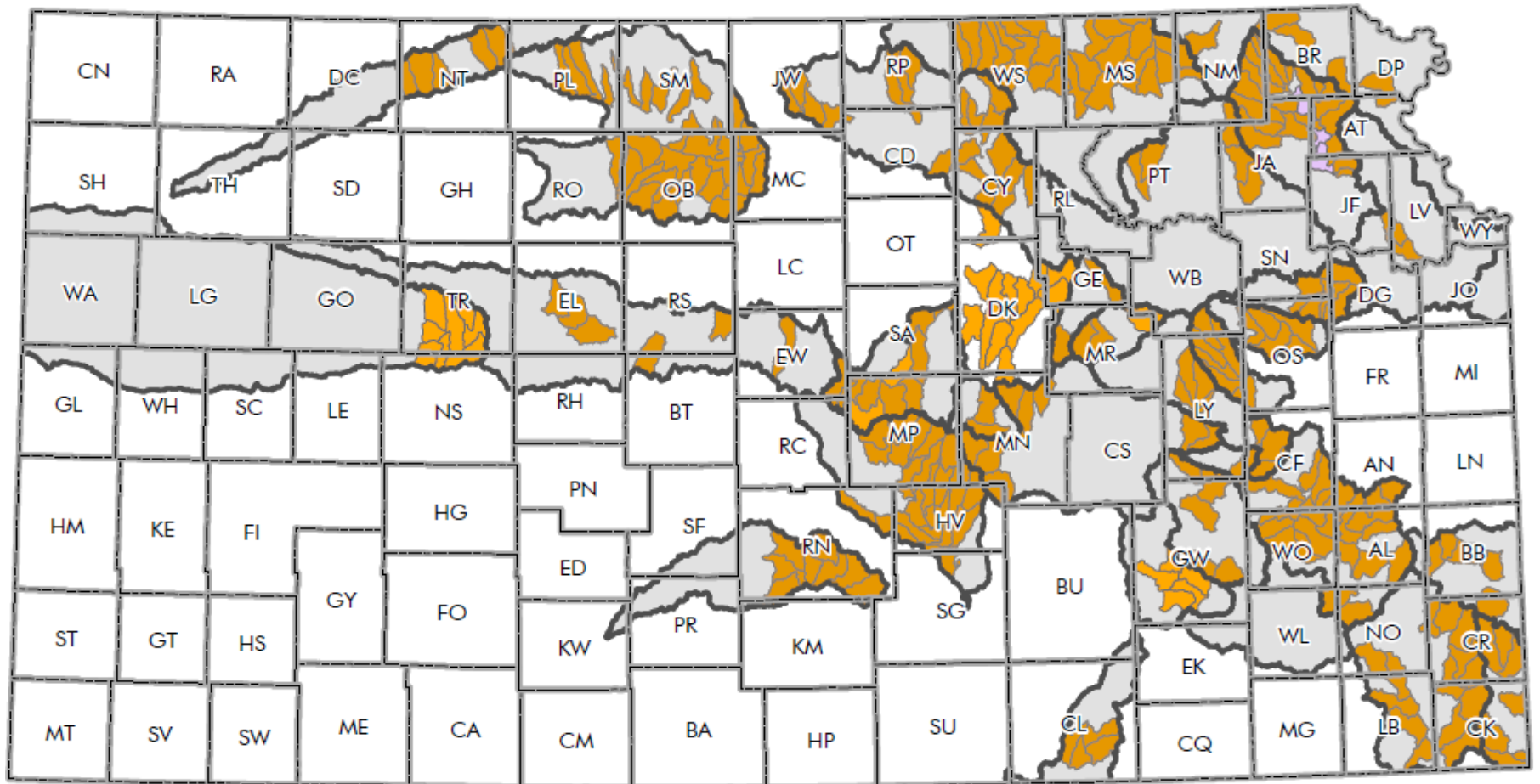
- **Local issues – Local solutions**
 - **Local stakeholders identify watershed issues (reservoir sedimentation, blue green algae blooms, nutrient or bacteria abatement)**
 - **Establishing watershed goals**
 - **Creating a conservation strategy to achieve goals**
 - **Implementing the strategy**
 - **Local Watershed Plans**



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Watershed Restoration and Protection Strategy



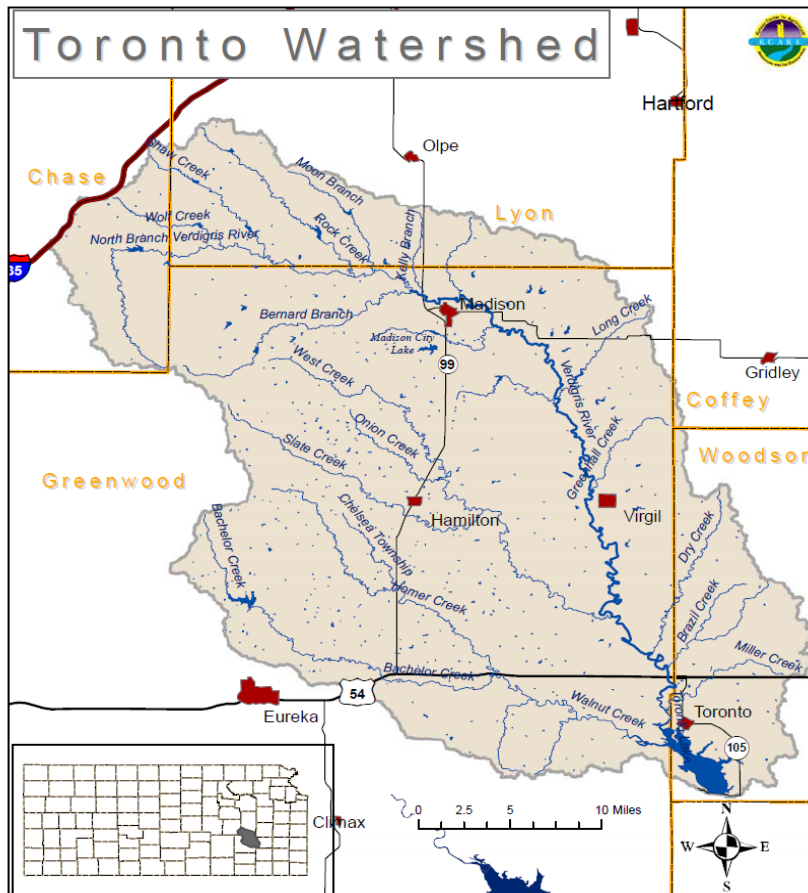
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WRAPS 9 Element Watershed Plans

Toronto Lake Watershed Example



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Restoration and Nonpoint Source Focus

- Implementation of Total Maximum Daily Loads
- Impaired Waters - 303(d) List
- Toronto Lake – HP TMDL (Eutrophication & Siltation)
- TMDLs provide NPS load reduction goals:

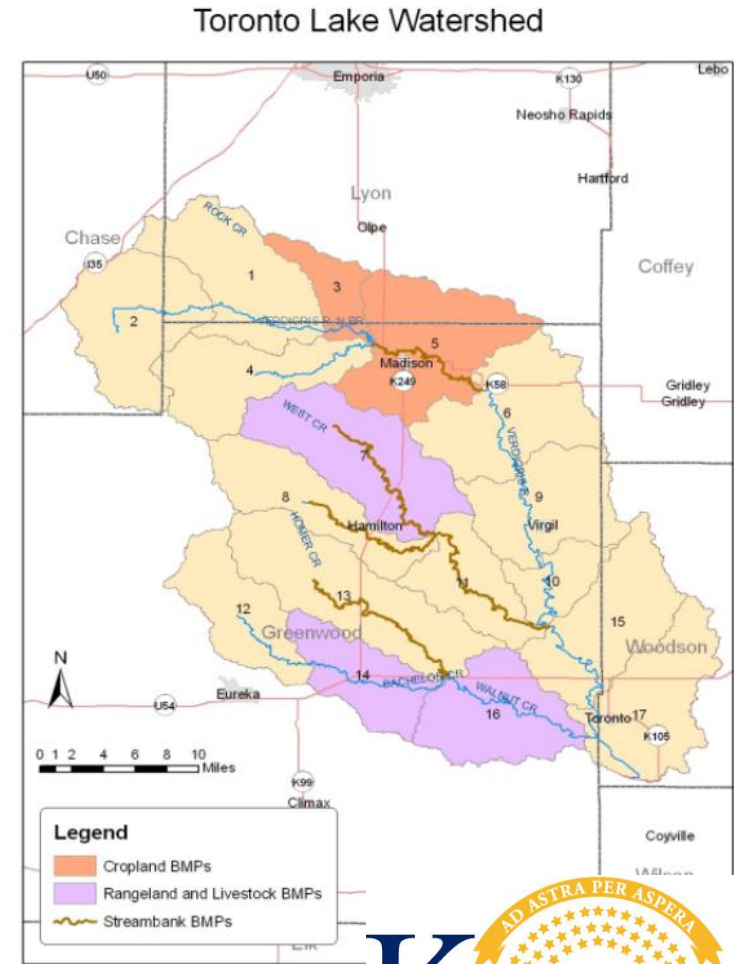
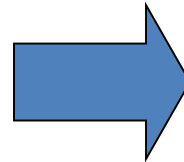
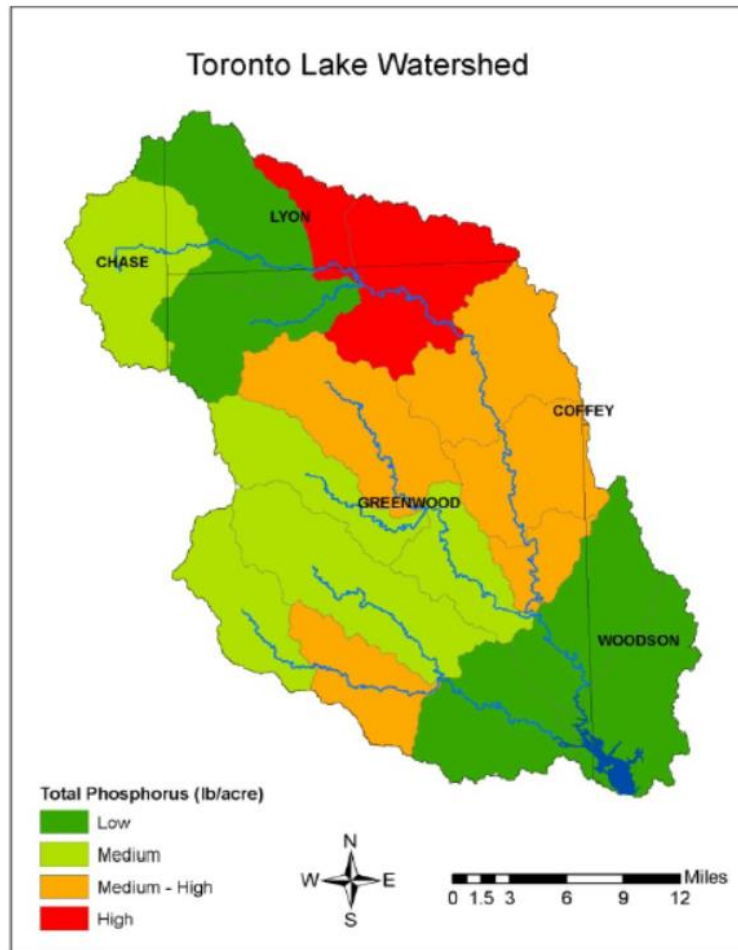
26,160
pounds
phosphorus
to be reduced
by BMPs



Assessing the Watershed for Critical Targeted Areas

- SWAT – KSU Dept. of Biological and Ag Engineering
 - Data for SWAT model collected from a variety of reliable online and printed data sources and knowledgeable agency personnel within the watershed.
 1. 30 meters DEM (USGS National Elevation Dataset)
 2. 30m NLCD 2001 Land Cover data layer (USDA-NRCS)
 3. STATSGO soil dataset (USDA-NRCS)
 4. NCDC NOAA daily weather data (NOAA National Climatic Data Center)
 5. Point sources (KDHE on county basis)
 6. Septic tanks (US Census)
 7. Crop rotations (local knowledge)
 8. Grazing management practices (local knowledge)
 - Top 20-30% of pollutant producing subwatersheds are selected as critical areas for cropland and livestock BMP implementation.

- Watershed assessments
- Determine critical areas





Best Management Practice Implementation

Combination of Livestock, Cropland, Streambank* and Rangeland BMPs to Meet the Toronto Phosphorous TMDL						
Year	Livestock Reduction (lbs/yr)	Cropland Reduction (lbs/yr)	Streambank* Reduction (lbs/yr)	Rangeland* Reduction (lbs/yr)	Total Reduction (lbs/yr)	% of TMDL
1	152	548	120	10	830	3.2%
2	1,096	1,095	240	20	2,451	9.4%
3	1,172	1,643	360	30	3,205	12.3%
4	2,115	2,190	480	40	4,826	18.4%
5	2,268	2,738	600	50	5,656	21.6%
6	3,211	3,286	720	60	7,276	27.8%
7	3,287	3,833	840	70	8,030	30.7%
8	4,230	4,381	960	80	9,651	36.9%
9	4,383	4,928	1,080	90	10,481	40.1%
10	5,250	5,476	1,200	100	12,026	46.0%
11	5,403	6,006	1,320	110	12,839	49.1%
12	6,346	6,537	1,440	120	14,443	55.2%
13	6,422	7,068	1,560	130	15,180	58.0%
14	7,365	7,598	1,680	140	16,784	64.2%
15	7,518	8,129	1,800	150	17,597	67.3%
16	8,385	8,659	1,920	160	19,124	73.1%
17	8,537	9,190	2,040	170	19,937	76.2%
18	9,481	9,721	2,160	180	21,541	82.3%
19	9,633	10,251	2,280	190	22,354	85.5%
20	10,500	10,782	2,400	200	23,882	91.3%
21	10,730	10,782	2,400	200	24,111	92.2%
22	11,597	10,782	2,400	200	24,978	95.5%
23	11,826	10,782	2,400	200	25,208	96.4%
24	12,693	10,782	2,400	200	26,075	99.7%
25	12,923	10,782	2,400	200	26,304	100.6%

*Assume average Phosphorous content in floodplain soil is 20 ppm.

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Load Reduction Estimates

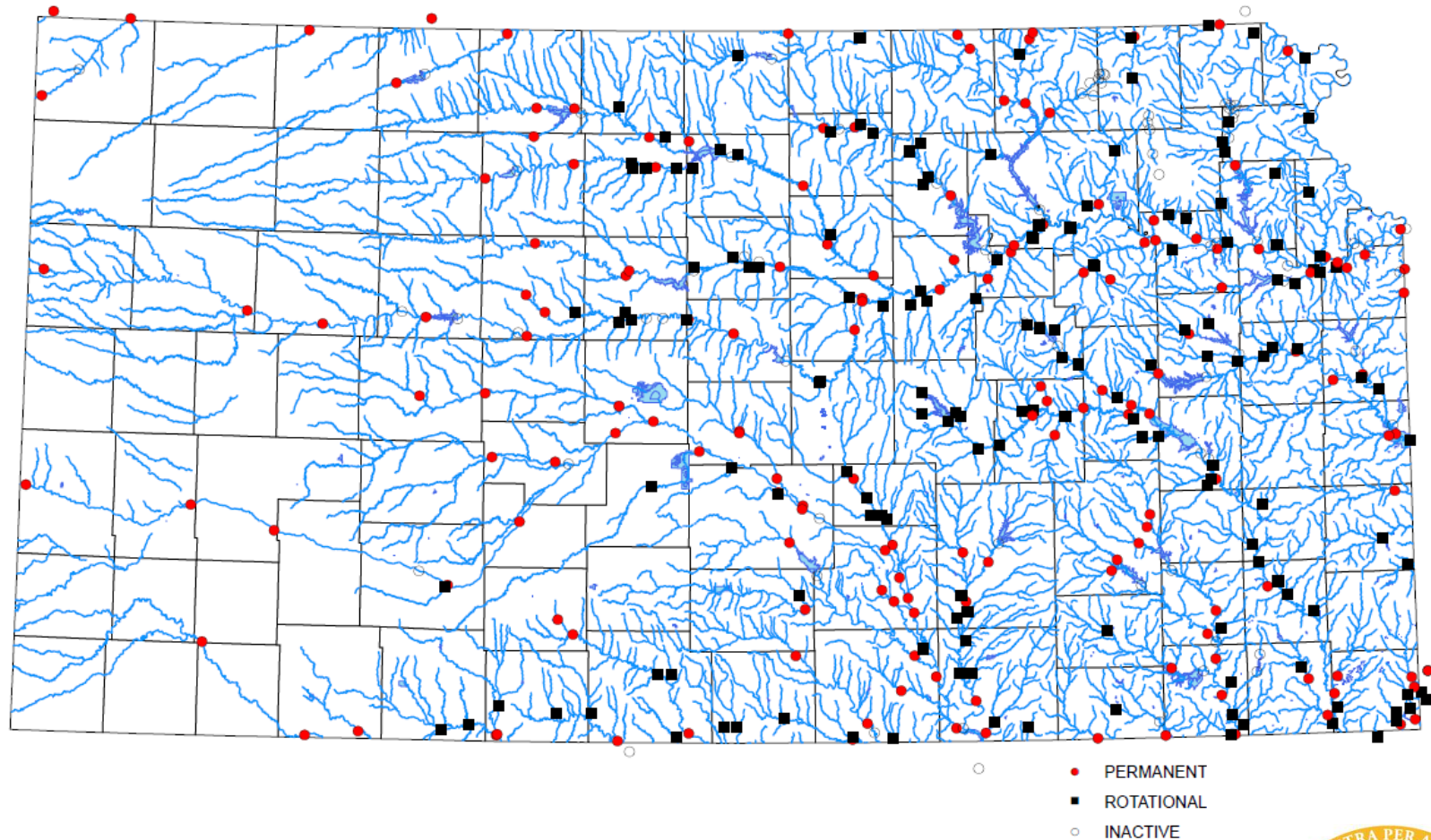
- Region 5 Load Reduction Model
 - Provides estimate of nutrient and sediment load reductions from the implementation of agricultural and urban BMPs at the source level.
 - Utilizes the Revised Universal Soil Loss Equation (RUSLE) to calculate the gross erosion rate before and after a BMP is implemented.
 - Factors used in the RUSLE include Rainfall-Runoff Erosivity Factor, Soil Erodibility Factor, Slope Length, Cover Management Factor and Support Practice Factor and currently use county level data to make calculations.
 - Livestock practice load reductions are calculated with a methodology developed in “Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual” (Michigan DEQ, June 1999), and includes local precipitation data.

Focus on Implementation

- With the priority areas identified, BMPs selected – projects have been focusing on implementation.
 - Results:
 - Sediment - #1 in the country at 142,450 tons / yr
 - Phosphorus - #2 in the country at 540,751 lbs / yr
 - Nitrogen - #4 in the country at 1,054,125 lbs/ yr
 - Emphasis on partnership:
 - NRCS, DOC, WRAPS



KANSAS STREAM CHEMISTRY MONITORING SITES

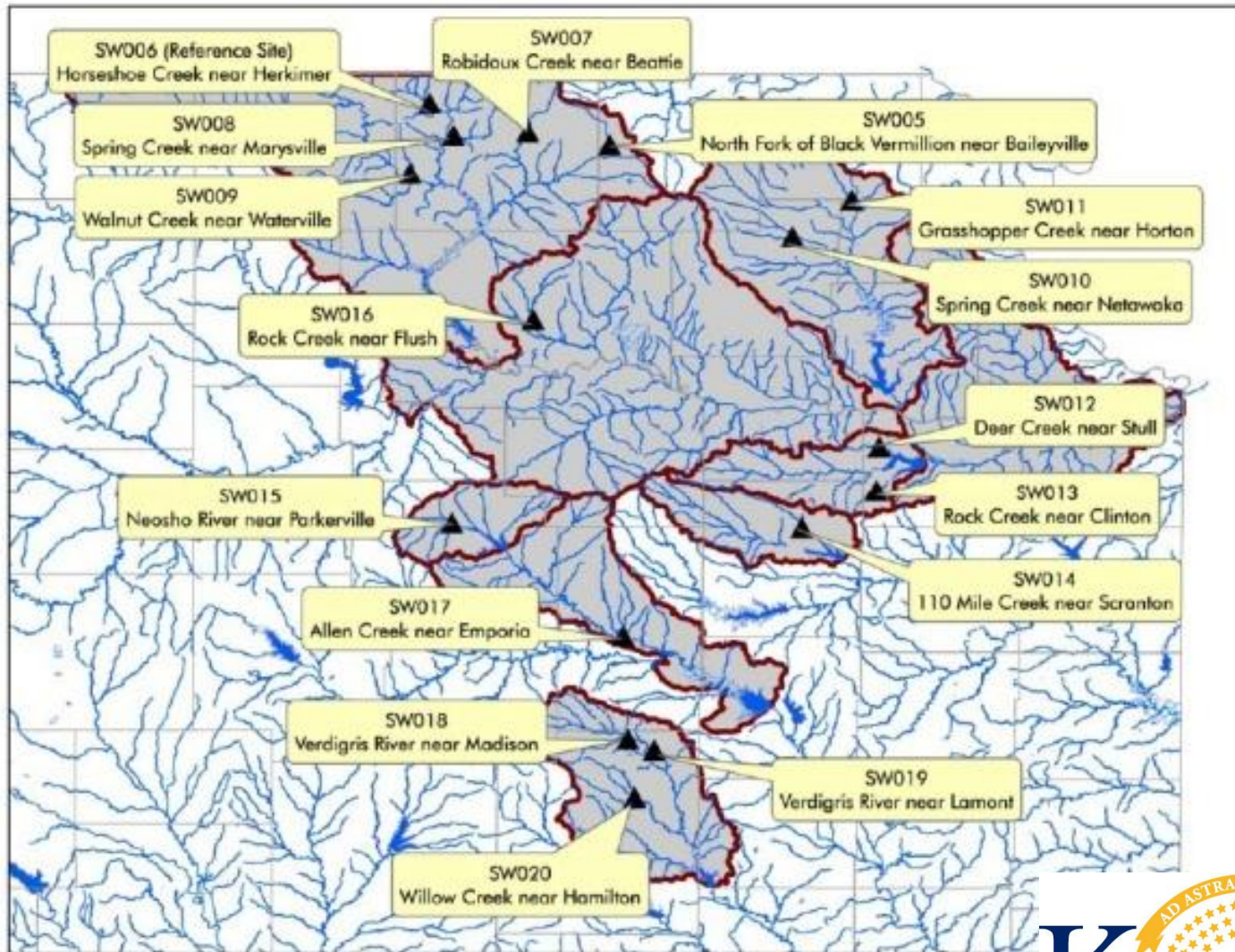


- PERMANENT
- ROTATIONAL
- INACTIVE

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Focus on Results - Baseline

- Supplemental Monitoring Strategy Initiated in late 2010
- Identified 15 subwatersheds (WRAPS targeted areas)
- 1 paired watershed study
- 4 routine samples during March – October timeframe
- One additional synoptic sample during a major runoff event
- Parameters: TSS, nutrients (N&P), pH, DO, temperature, Bacteria and flow estimates (Atrazine specific to subwatershed)
- The paired watershed study will include water chemistry, biological, flow and habitat sampling



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Watershed Success Story

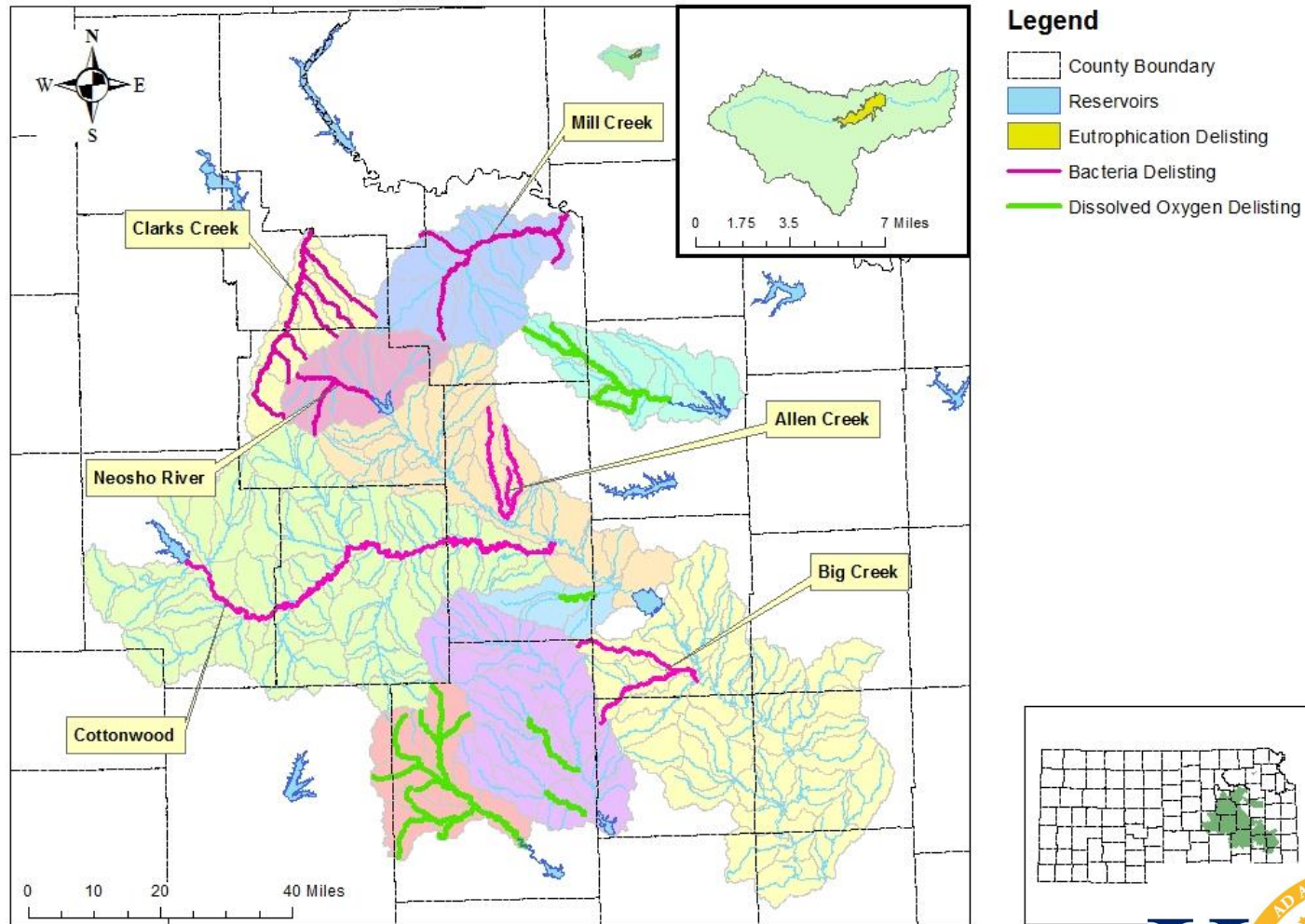
- Load Reductions lead to Success (improved water quality to meet water quality standards)
- Success Stories
 - Clarks Creek – (136 stream miles) Bacteria
 - Allen Creek (31 stream miles)– Bacteria
 - Banner Creek Reservoir – Phosphorus and Chlorophyll
 - Walnut and West Creeks (30 miles) – Dissolved Oxygen
 - Eagle Creek (~72 miles) – Dissolved Oxygen
 - Dragoon Creek (76 miles)– Dissolved Oxygen
 - Neosho River (32 miles) – Bacteria
 - Big Creek (~63 miles) – Bacteria
 - Mill Creek (74 miles) – Bacteria
 - Fall River (144 miles)

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Health and environment of all Kansans



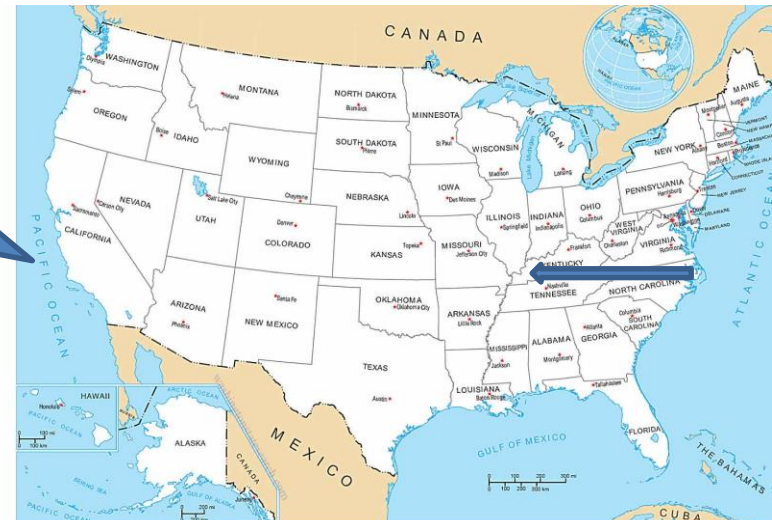
WRAPS Project Areas with Success Stories



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Watershed Success Story

781 Stream
Miles!



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health and environment of all Kansans.

KS WRAPS Program: Where we are headed

- Continued Focus / Emphasis on conservation practice Implementation
- Providing more resources than ever towards implementation
- Watershed Plan Review – 5 year
 - Evaluation of how we are doing
 - Stay the course? Change directions?

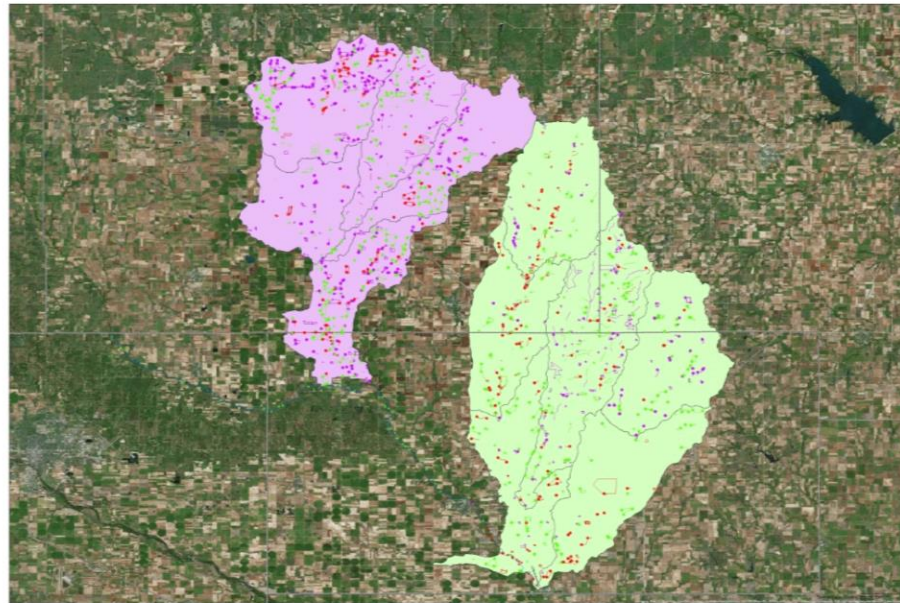


9 Element WRAPS Plan Review

- 4 Components
 - Stakeholder Leadership Team self evaluation
 - Pre-evaluation Reconnaissance
 - Evaluation
 - Update of 9 Element Watershed Plan



WRAPS Critical Area Aerial Assessments...

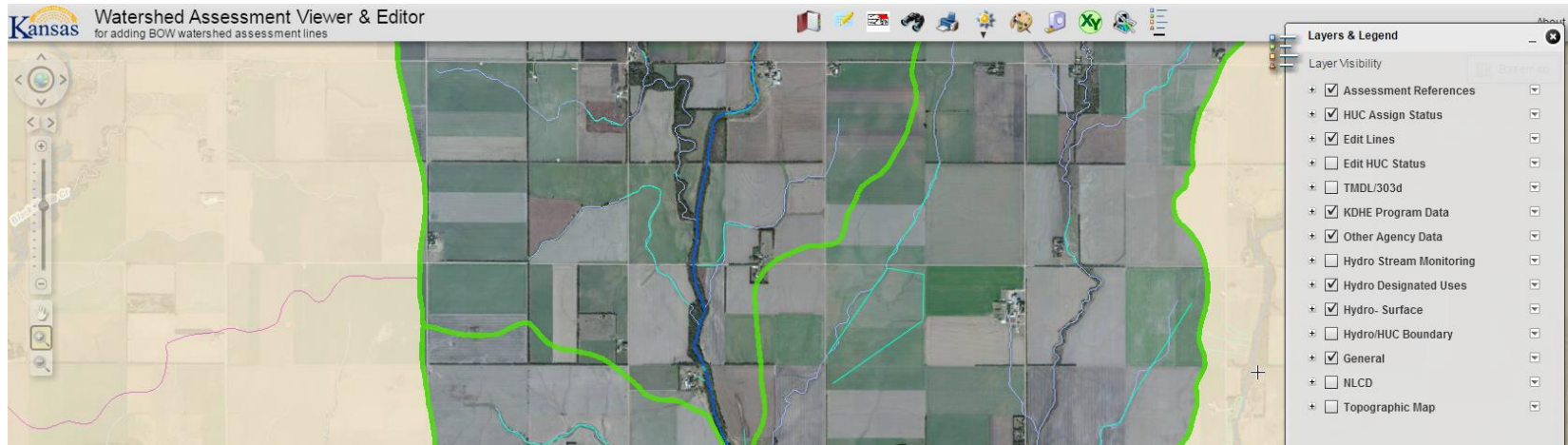


...with Plan Review

- Nine Element Watershed Plan Review – 2015
 - Targeted Areas
 - Targeted Practices
 - Change targeted areas?
- WRAPS finding projects vs. projects finding WRAPS
 - What practices to focus on

Aerial Assessments

- Looking at Aerial Images to identify NPS areas of interest
- WMS GIS Webmapper tool and protocol developed to look at aerial images and mark them



- No geospatial analysis is being done or data collected, only using professional judgment to identify areas for further investigation

KS WRAPS Program: Where we are headed

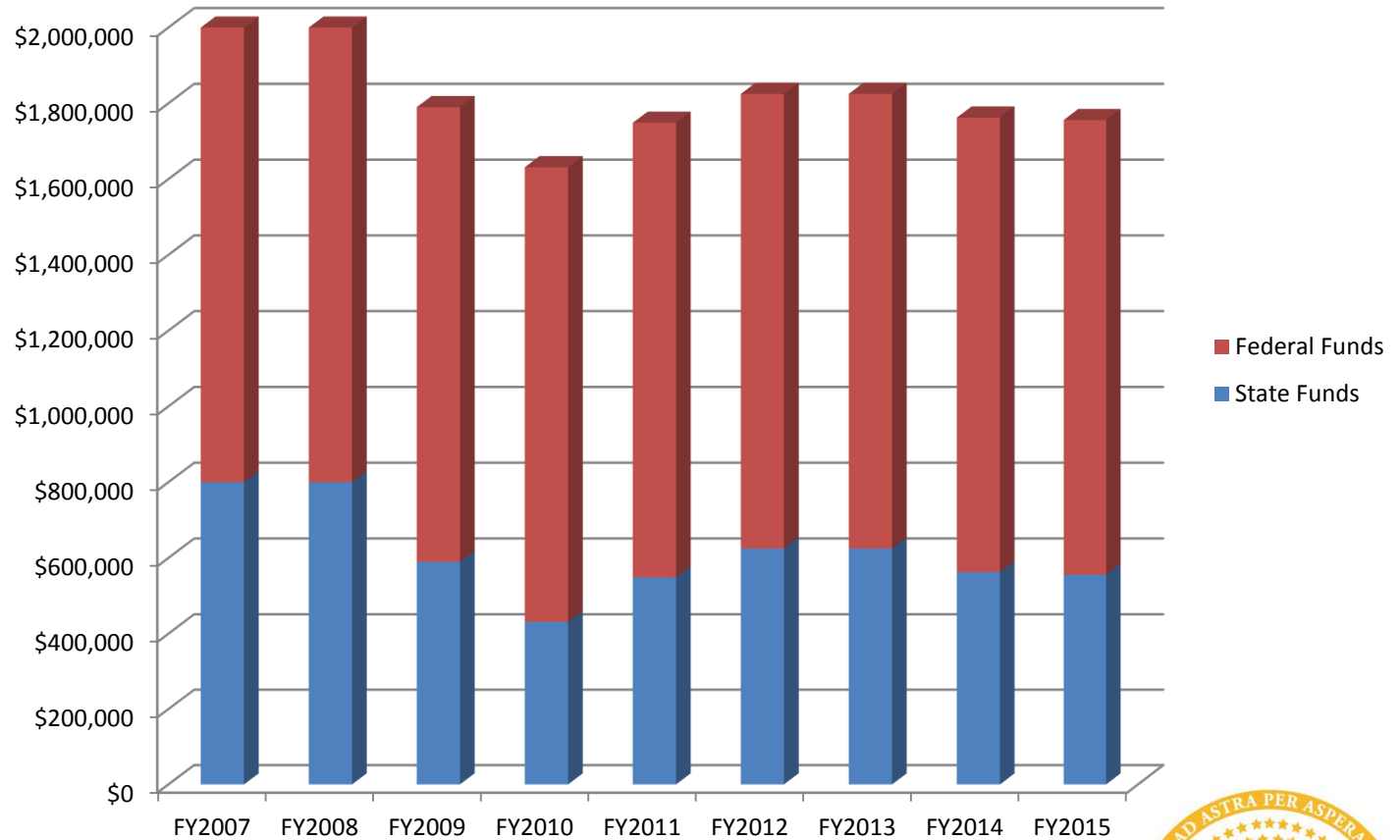
- Outreach Campaign
 - Tell the story of our programs
 - New and innovative ideas to reach landowners
 - Two primary audiences
 - Policy makers / Legislators
 - Landowners / Producers

KS WRAPS Program: Where we are headed

- Funding Diversity
 - NRCS – National Water Quality Initiative
 - NRCS – Regional Conservation Partnership Program
 - Division of Conservation Partners
- Partner/Pursue new funding sources
 - Nutrient CREP – KWO
 - Local Conservation Lending Program - KDHE
 - Off-site BMP Implementation – Little Ark WRAPS
 - Drinking Water Protection - KDHE



KS WRAPS Budget:



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Annual Funding Needs for Conservation Practices

WRAPS Plan Best Management Practice Funding Needs to achieve TMDLs and/or protect high priority waters.						
WRAPS	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Middle Marais des Cygnes	\$70,454	\$73,090	\$71,876	\$77,540	\$76,255	\$369,215
Middle Neosho	\$732,080	\$756,616	\$779,846	\$803,786	\$822,836	\$3,895,164
Milford	\$371,701	\$391,002	\$397,849	\$411,197	\$418,352	\$1,990,101
Missouri	\$32,716	\$56,732	\$28,581	\$77,177	\$57,007	\$252,213
Neosho Headwaters	\$180,259	\$189,272	\$191,236	\$200,797	\$202,883	\$964,447
Pomona	\$190,905	\$198,902	\$202,531	\$211,016	\$214,867	\$1,018,221
Prairie Dog Creek	\$444,025	\$507,029	\$445,576	\$562,818	\$638,639	\$2,598,087
Spring River	\$188,450	\$200,188	\$199,927	\$212,379	\$212,103	\$1,013,047
Toronto	\$73,796	\$81,074	\$71,924	\$86,011	\$83,058	\$395,863
Tuttle	\$1,415,486	\$1,470,949	\$1,501,690	\$1,560,531	\$1,593,144	\$7,541,800
Twin Lakes	\$105,823	\$109,388	\$112,268	\$116,050	\$119,105	\$562,634
Upper Lower Smoky	\$198,780	\$203,240	\$216,872	\$215,618	\$223,327	\$1,057,837
Upper Neosho	\$708,583	\$729,020	\$755,247	\$773,417	\$797,515	\$3,763,782
Upper Timber	\$11,726	\$12,078	\$12,441	\$12,814	\$13,199	\$62,258
Upper Wakarusa	\$56,073	\$56,073	\$56,073	\$112,146	\$112,146	\$392,511
Upper Walnut	\$152,864	\$154,200	\$158,827	\$165,231	\$170,362	\$801,484
Waconda	\$1,077,060	\$1,113,281	\$1,146,679	\$1,181,079	\$1,452,323	\$5,970,422
Total	\$11,118,783	\$11,450,639	\$11,277,801	\$11,821,662	\$12,446,160	\$58,115,045

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Our combined budget needs to achieve Water Quality Goals in your watershed plans:





Questions



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