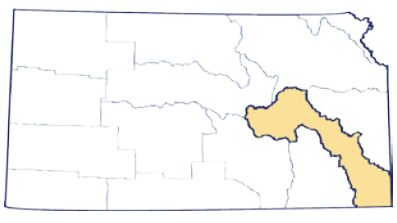
State of the Resource & Regional Goal Action Plan Implementation Report

August 2018

Neosho

Regional Planning Area



Kansas Water Office

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Executive Summary

The Neosho State of the Resource & Regional Goal Action Plan Implementation Report is intended to provide a background of the regional issues and record activities and progress toward regional goals and the *Long-Term Vision for the Future of Water Supply in Kansas (The Vision)* objectives utilizing the most up to date data available at the time of report development.

Conservation of surface water is a primary objective of the Neosho Regional Advisory Committee (RAC). Action plans developed by the RAC to benefit regional water resources include; prolonging the water supply storage in John Redmond Reservoir, reducing vulnerability to drought, reducing the frequency of algal blooms, increasing storage in the basin below John Redmond Reservoir, and assessing the effectiveness of Best Management Practices (BMPs).

Surface and groundwater resources within the Neosho Region suffered from lower than normal precipitation from 2010 to 2015. Due to very low precipitation in 2011 and 2012, water use spiked at almost 65,000 acre-feet for the region, with industrial use from surface water sources just over 30,000 acre-feet in 2011.

Sediment reduction efforts are ongoing within the region with achievements resulting from the implementation of streambank stabilization projects. Prior to 2017, 85% of the average annual sedimentation reduction occurred from implementing streambank stabilization projects, while 15% occurred from the implementation of BMPs. In 2017, a 63% reduction occurred from streambank stabilization projects and 37% from implementation of BMPs.

Changes in reservoir sedimentation from BMP implementation and streambank stabilization projects show the most significant reductions are in the John Redmond Reservoir watershed, accounting for more than 25% of the annual sedimentation of the entire region. Benefits of sediment reduction practices are estimated to extend the lifetime of John Redmond Reservoir from 2094 to 2120. However, other reservoirs within the region are relatively unchanged from their historical sedimentation rate.

The Neosho Region's current water supply and demands are being quantified. With the use of the Multi-basin Evaluation of Kansas Reservoir Operations (MEKRO) model, availability of supply during drought times is being assessed. As part of this process, reallocation of storage in the federal reservoirs is being considered and evaluated.

To reduce sediment, and ensure a safe and reliable source of water, coordination between federal, state, and local entities is being organized to match similar goals and work being accomplished in order to leverage funding. Working with the Conservation Districts, Watershed Restoration and Protection Strategy (WRAPS), Kansas Department of Health and Environment (KDHE), Kansas Department of Agriculture-Division of Conservation (KDA-DOC), and the RAC will help ensure the citizens of the Neosho Region have access to a dependable and high quality supply of water.

Water Use Trends

Surface water is the primary source of water within the Neosho Region, accounting for approximately 86% of the total reported water use. The majority of groundwater sources within the upper region are from the alluvial deposits along major streams. The Ozark Plateau Aquifer system supplies much of the groundwater used, especially for municipal use, within Crawford and Cherokee counties.

Industrial use (54%) is the primary use from surface water sources within the region, due to the water used by Wolf Creek Nuclear Operating Corporation (WCNOC). Other reported surface water use within the region includes municipal (33%), recreation (8%), irrigation (4%), and stock water (<1%). Municipal use (81%) is the primary use from groundwater sources. Other reported groundwater use within the region includes irrigation (13%), industrial (3%), stock water (3%), and recreation (<1%).

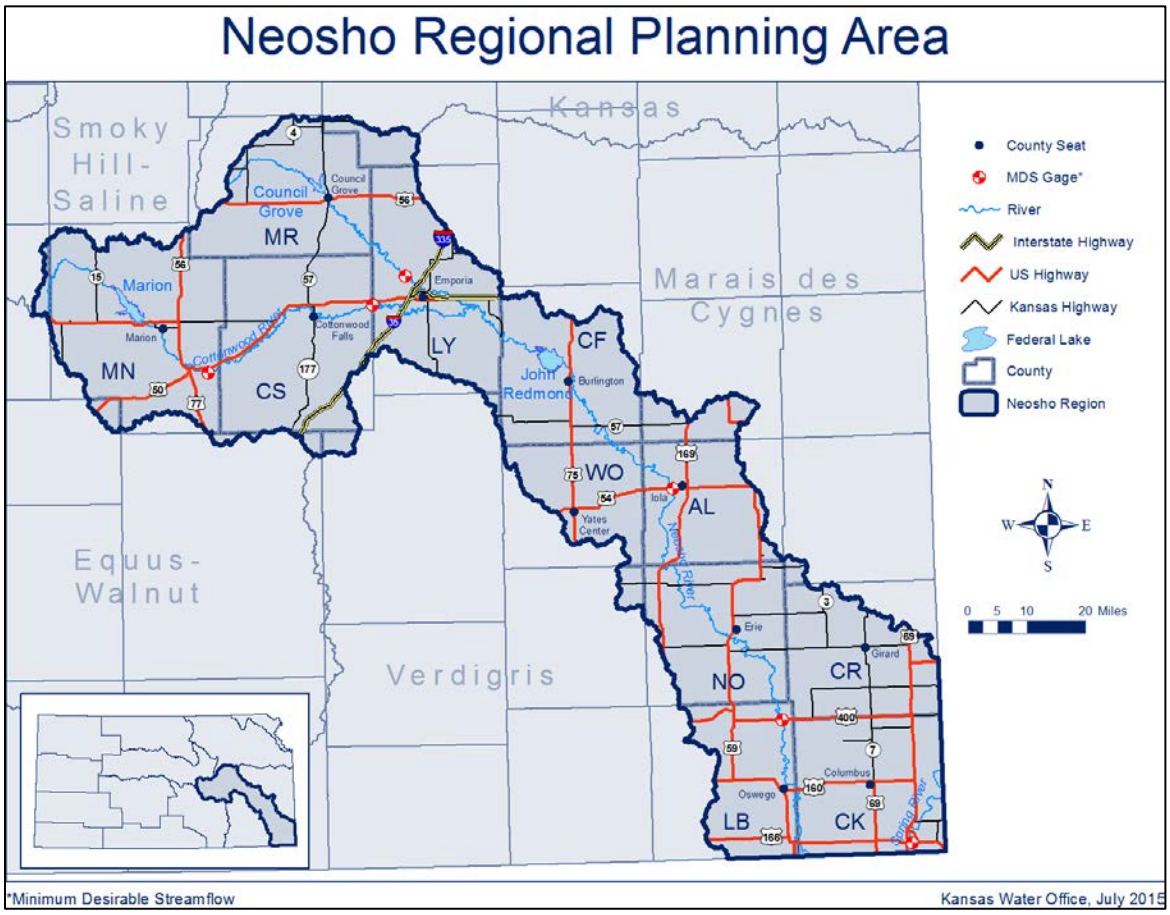
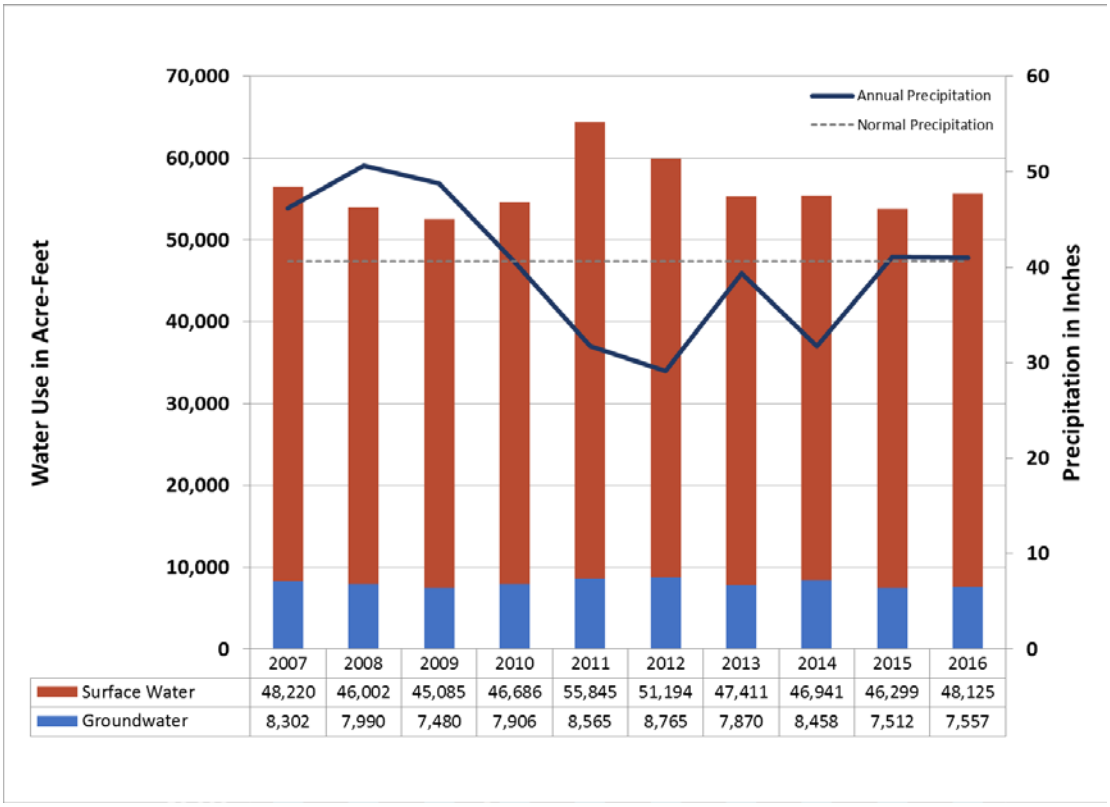


Figure 1: Neosho Regional Planning Area



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Surface Water	48,220	46,002	45,085	46,686	55,845	51,194	47,411	46,941	46,299	48,125
Groundwater	8,302	7,990	7,480	7,906	8,565	8,765	7,870	8,458	7,512	7,557

Figure 2: Annual surface and ground water reported use with precipitation data, Neosho Region

Annual reported water use for the region fluctuates based on climate conditions with higher water use resulting from periods of hot and dry weather during the growing season and lower water use during periods of cooler and/or wetter weather.

Water Resource Conditions

Groundwater

Groundwater accounts for 14% of the reported water use in the Neosho Region, with more than 80% being used for municipal purposes (Figure 3).

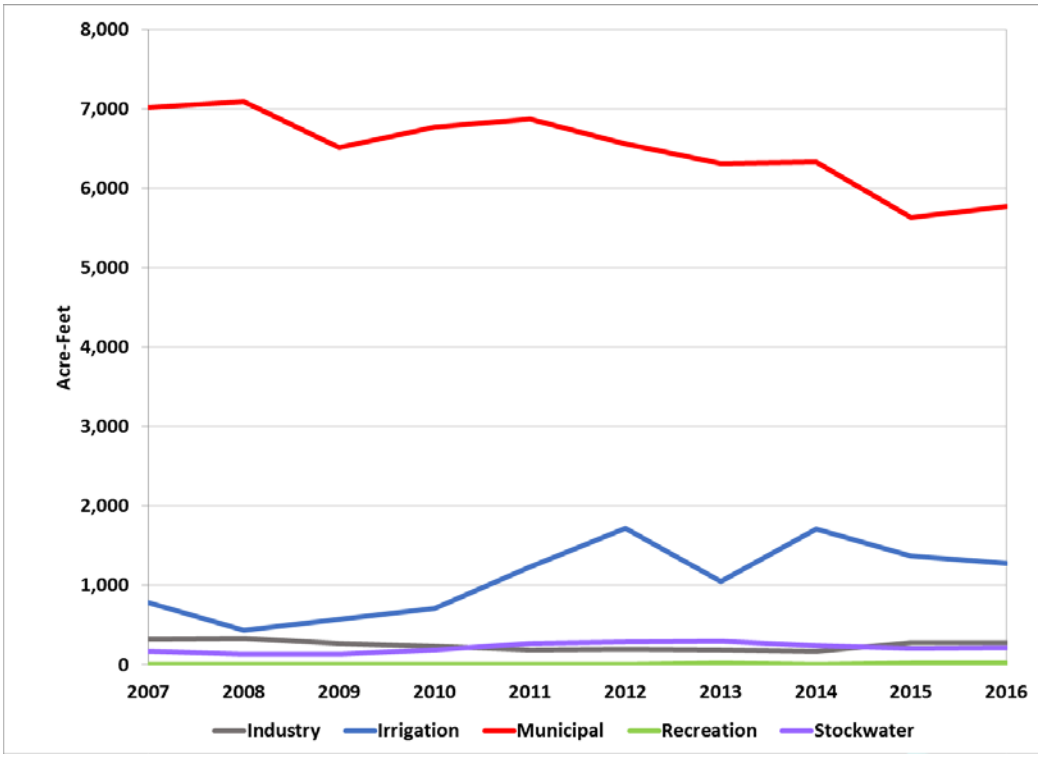


Figure 3: Reported groundwater use by beneficial use

Most of this use occurs in southeast Kansas from the Ozark Plateau Aquifer system, which is shared by Arkansas, Kansas, Missouri, and Oklahoma (Figure 5). The Ozark Plateau Aquifer system is the main source of municipal water for Crawford and Cherokee counties.

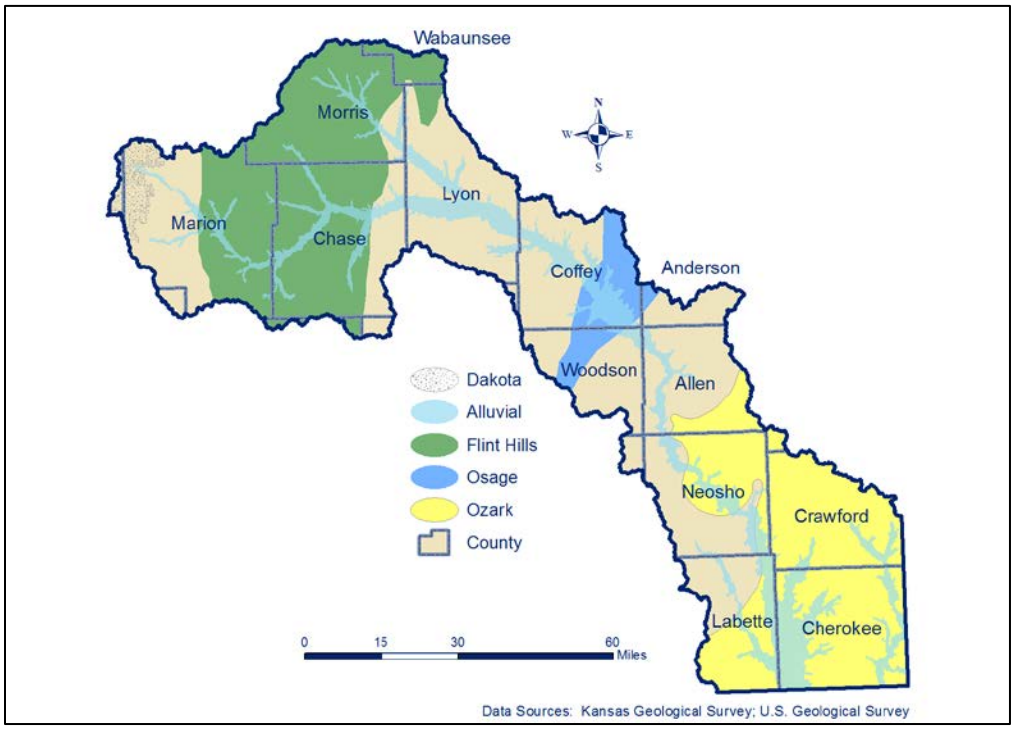


Figure 4: Neosho Region Aquifers

Between 2005 and 2009, studies were undertaken to evaluate the extent of the groundwater declines in the Ozark Aquifer, the associated water quality problems, and to develop a model that could be used to assist in management decisions. The studies showed that pumping was shown to be sustainable in Kansas, even with a four percent annual increase through 2057.

The Ozark Plateau Aquifer safe yield has been determined to be at least 36,000 acre-feet per year, or approximately three times the current authorized amount. In determining if future applications should be approved, a localized two-mile safe yield test is performed, opening the area up to new appropriations and allowing additional growth to occur within a reasonable boundary. DWR continues to conduct quarterly well level measurements in the region, while the USGS monitors water levels in all four states.

Surface Water

The Cottonwood and Neosho Rivers flow from the upper portion of the region with the Cottonwood River beginning in Marion County and the Neosho beginning in Morris County. The two rivers join in Lyon County east of Emporia.

Surface water accounts for more than 86% of the reported water use in the Neosho Region, with more than 50% being used for industrial purposes. As seen in Figure 5, municipal use is fairly steady from year to year; however, industrial use can fluctuate based on climatic conditions.

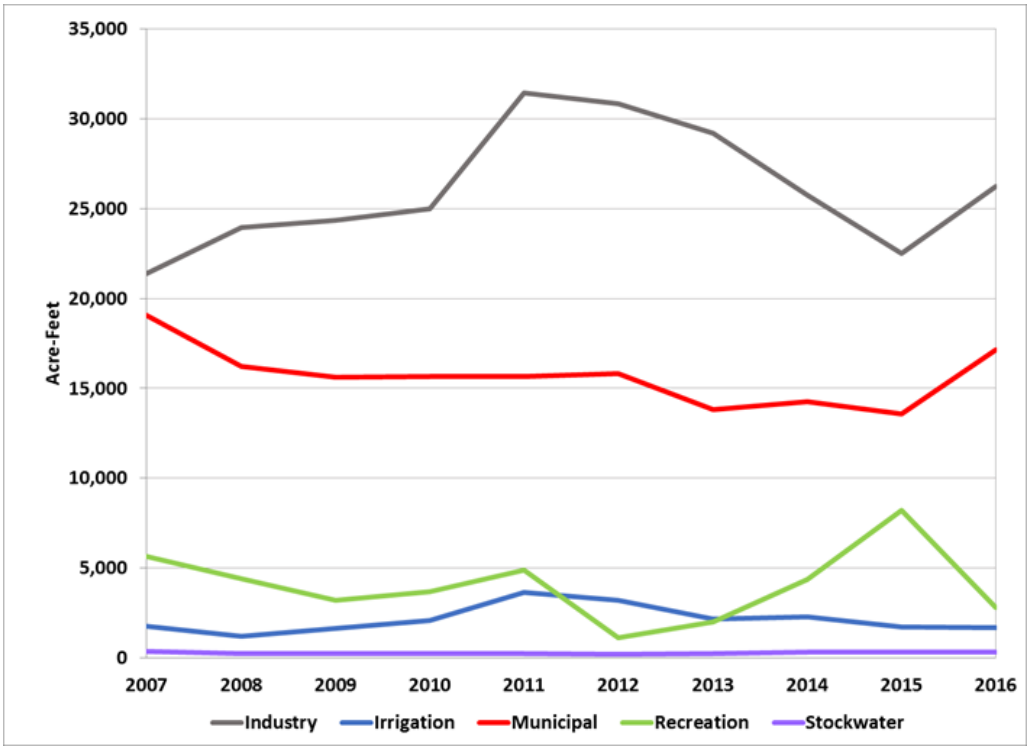


Figure 5: Annual surface water use by type of use

The Spring River flows from southwest Missouri into southeast Kansas, through Cherokee County, and into northeast Oklahoma. In Kansas, the Spring River is currently a major water supply source for Empire

Electric District Company, Spring River Public Wholesale Water Supply District No. 19 (PWWSD No.19), and the City of Baxter Springs. The Spring River is one of only four rivers in the state that is currently open to new (unrestricted) water appropriations.

There are three federal reservoirs in the region: Marion Reservoir, Council Grove Lake, and John Redmond Reservoir. Coffey County State Fishing Lake provides cooling water for WCNOC and depends on John Redmond Reservoir for supplemental water during dry conditions. All counties in the Neosho Region have state fishing lakes. Council Grove City Lake serves as a water supply for the city of Council Grove.

Each of the three federal reservoirs have fluctuating water levels throughout the year, as can be seen in the past two years of recorded lake level elevations in Figures 6-8 .

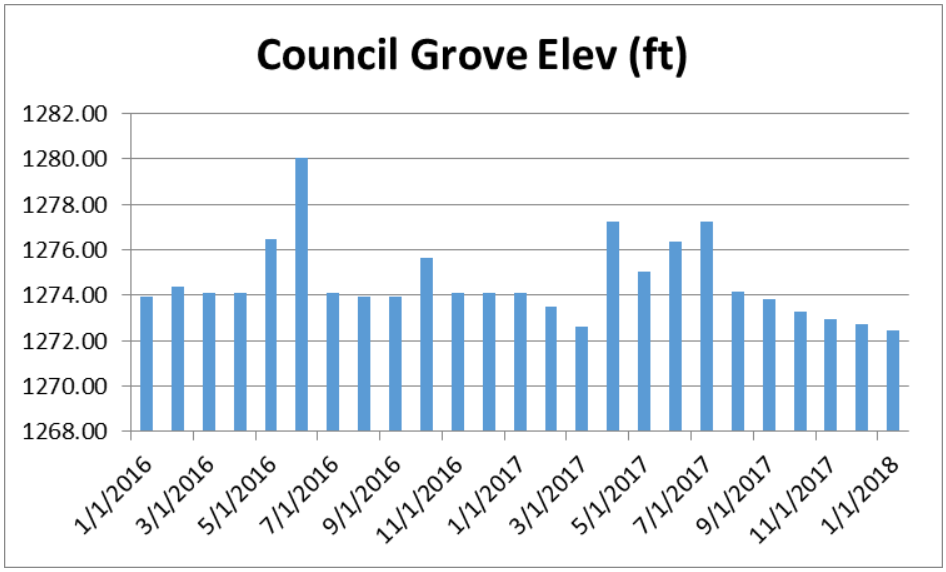


Figure 6: Elevation of Council Grove Reservoir, conservation pool elevation: 1,274 feet

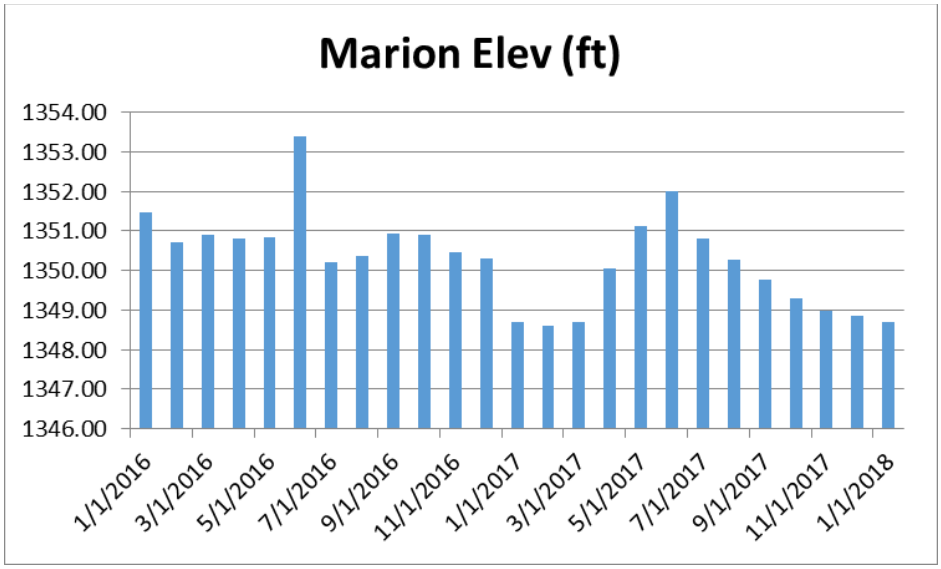


Figure 7: Elevation of Marion Reservoir conservation pool elevation: 1,350.5 feet

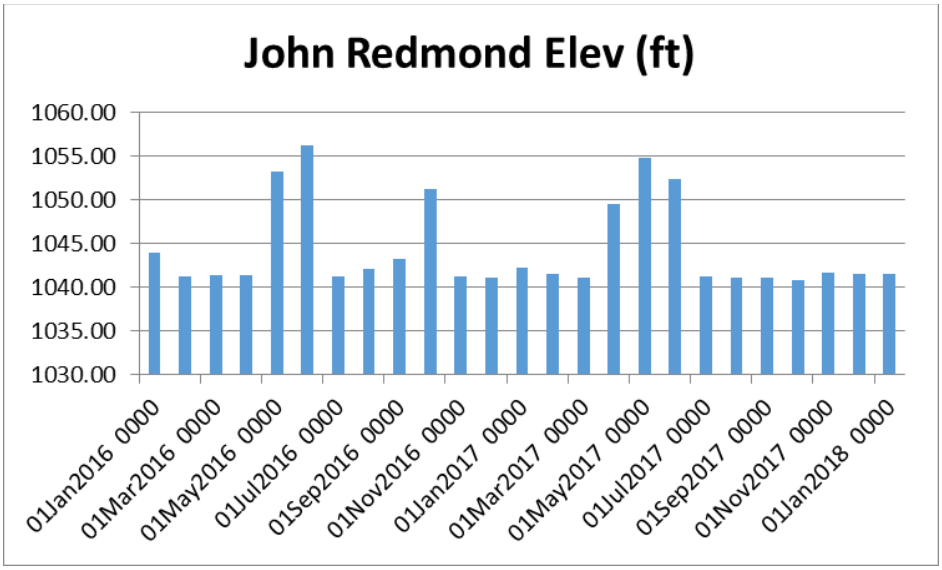
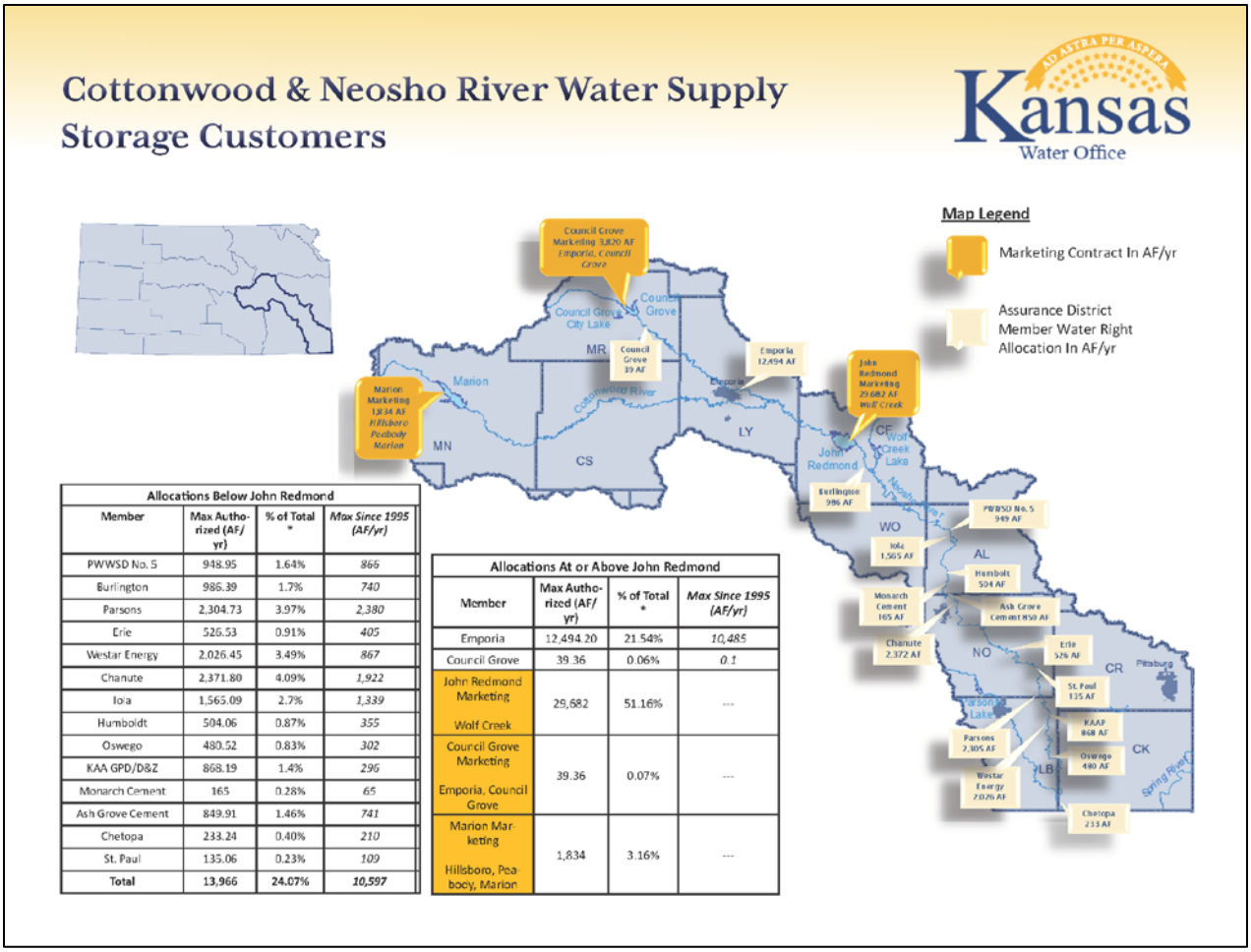


Figure 8: Elevation of John Redmond Reservoir, conservation pool elevation: 1,041 feet

The fluctuation in lake levels is due to precipitation trends and water management strategies to operate the lakes for the Water Assurance District and the Water Marketing Program. The Lake Level Management Plan dictates levels for Marion Reservoir.



Allocations Below John Redmond

Member	Max Authorized (AF/yr)	% of Total *	Max Since 1995 (AF/yr)
PWWSD No. 5	948.95	1.64%	866
Burlington	986.39	1.7%	740
Parsons	2,304.73	3.97%	2,380
Erie	526.53	0.91%	405
Westar Energy	2,026.45	3.49%	867
Chanute	2,371.80	4.09%	1,922
Iola	1,565.09	2.7%	1,339
Humboldt	504.06	0.87%	355
Oswego	480.52	0.83%	302
KAA GPD/D&Z	868.19	1.4%	296
Monarch Cement	165	0.28%	65
Ash Grove Cement	849.91	1.46%	741
Chetopa	233.24	0.40%	210
St. Paul	135.06	0.23%	109
Total	**13,966**	**24.07%**	**10,597**

Allocations At or Above John Redmond

Member	Max Authorized (AF/yr)	% of Total *	Max Since 1995 (AF/yr)
Emporia	12,494.20	21.54%	10,485
Council Grove	39.36	0.06%	0.1
John Redmond Marketing Wolf Creek	29,682	51.16%	---
Council Grove Marketing Emporia, Council Grove	39.36	0.07%	---
Marion Marketing Hillsboro, Peabody, Marion	1,834	3.16%	---

Figure 9: Cottonwood and Neosho River water supply storage customers

Water Quality

Surface Water

Water quality and related water resource issues are addressed through a combination of watershed restoration and protection efforts utilizing voluntary, incentive-based approaches, as well as regulatory programs.

The Clean Water Act requires states to conduct Total Maximum Daily Load (TMDL) studies and develop TMDLs for water bodies identified on the state's List of Impaired Waters (Section 303(d) List). Total Maximum Daily Loads are quantitative objectives and strategies needed to achieve the state's surface water quality standards. A list of all impaired/potentially impaired water for the Neosho Region can be found on the KDHE impaired waters website.

In the Neosho Region there are 108 stream segments and 26 lakes that are considered 303(d) listed. Below are the water bodies with TMDLs in the Neosho Region and any associated changes to their listing.

Table 1: TMDLs in Neosho Region with associated changes

HUC 8	Waterbody Name	Description of Change	Category	Impairment	Station
11070205	Mined Land Lake 22	Delisted in 2016	2	Perchlorate	LM036801
11070205	Lightning Creek Near Oswego	Delisted in 2016	2	Temperature	SC565
11070205	Labette Creek Near Labette	Insufficient data to make a use designation	3	Biology	SC564
11070203	Bloody Creek Near Saffordville	Insufficient data to make a use designation	3	E. coli	SC689
11070207	Shoal Creek Near Galena	Previous delisted that go back to 4a	4a	Cadmium	SC212
11070202	Doyle Creek Near Florence	Previous delisted that go back to 4a	4a	Sulfate	SC120
11070201	Lake Kahola	New TMDL developed since 2014	4a	Eutrophication	LM043401
11070207	Shoal Creek Near Galena	New TMDL developed since 2014	4a	Total Phosphorus	SC212
11070201	Neosho River At Neosho Rapids	New TMDL developed since 2014	4a	Total Phosphorus	SC273
11070203	Cottonwood River Near Emporia	New TMDL developed since 2014	4a	Total Phosphorus	SC274
11070207	Short Creek Near Galena	New TMDL developed since 2014	4a	Total Phosphorus	SC570
11070201	Neosho River Near Parkerville	New TMDL developed since 2014	4a	Total Phosphorus	SC637
11070207	Shawnee Creek Near Crestline	New Category 5 Listing	5	Atrazine	SC569

Spring River and its tributaries in the far southeastern part of the region, including Shoal Creek, Short Creek, Shawnee Creek, Turkey Creek, and Center Creek in Cherokee County, are a valuable biological resource in the region, providing habitat for many unique and some threatened and endangered (T&E) species. Of particular concern are mussel populations that have been in decline since the start of heavy metal mining. Due to historic mining activities in the area, these waters are contaminated by lead, zinc, copper, and cadmium and TMDLs have been developed for these streams.

Harmful Algal Blooms

Harmful Algal Blooms (HABs) are common in bodies of water when nutrient loading is excessive and during periods of elevated temperatures. Marion Reservoir has experienced HABs nearly every year since 2011, with Marion County State Fishing Lake HABs occurring every year since 2016.

Table 2: Marion Reservoir and Marion County State Fishing Lake HABs from 2011-2017

Water Body Name	2011	2012	2013	2014	2015	2016	2017
Marion Co. State Fishing Lake	x	x				x	x
Marion Reservoir	x	x	x	x	x	x	x

Health effects of HABs are well documented from flu like symptoms in humans to the death of pets. Water supplies are often shut down during the blooms and beaches are closed; contact by both humans and animals is discouraged. These blooms cause water quality issues, threats to public health, increased costs for water supply treatment, and economic loss in the region.

The KDHE may issue two different levels of public health protection notifications: a Public Health Watch or a Public Health Warning. These notification levels are determined by the concentration of a harmful toxin(s) or the concentration of cyanobacteria cell counts. In 2017, HAB conditions were reported for Marion Reservoir from June 1 to August 10 and for Marion County State Fishing Lake from June 15 to September 21.

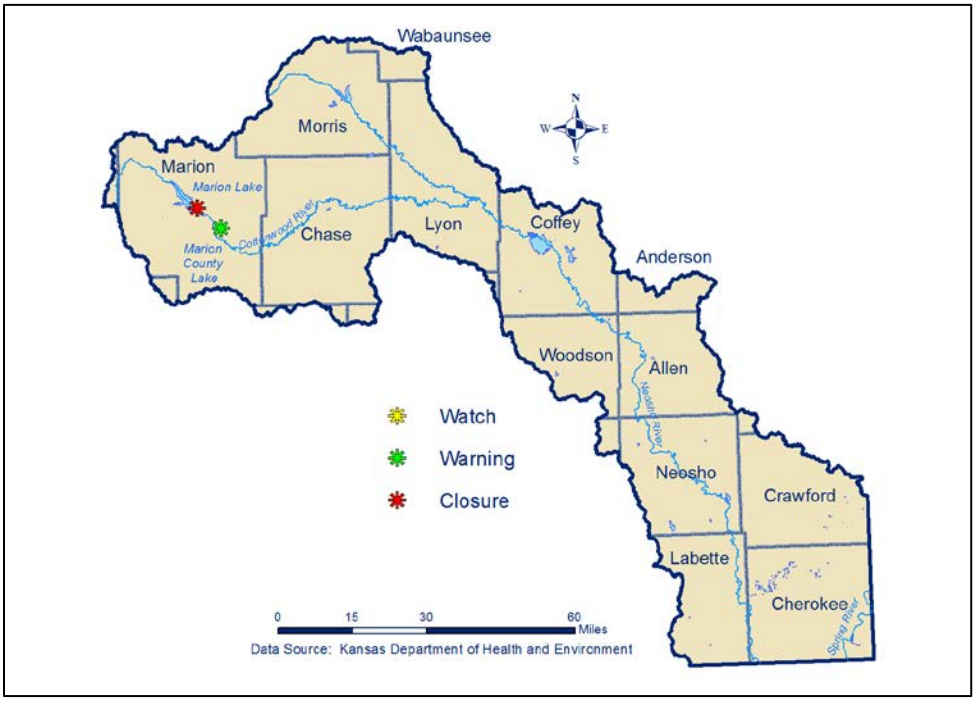


Figure 16: 2017 HABs in Neosho Region

Sedimentation

Sedimentation is a major issue in the eastern regions of the state and creates many challenges to managing reservoir water supplies. As reservoirs age, they accumulate sediment, reducing the reservoir's capacity to hold water supply for municipal and industrial customers, meet in lake recreation, and downstream water quality and habitat needs. The reservoirs in this region are affected by sedimentation, especially John Redmond Reservoir. Loss of capacity in John Redmond Reservoir is the most pressing issue among the three federal reservoirs. Dredging activities, which were completed in October 2016, removed three million cubic yards of sediment.

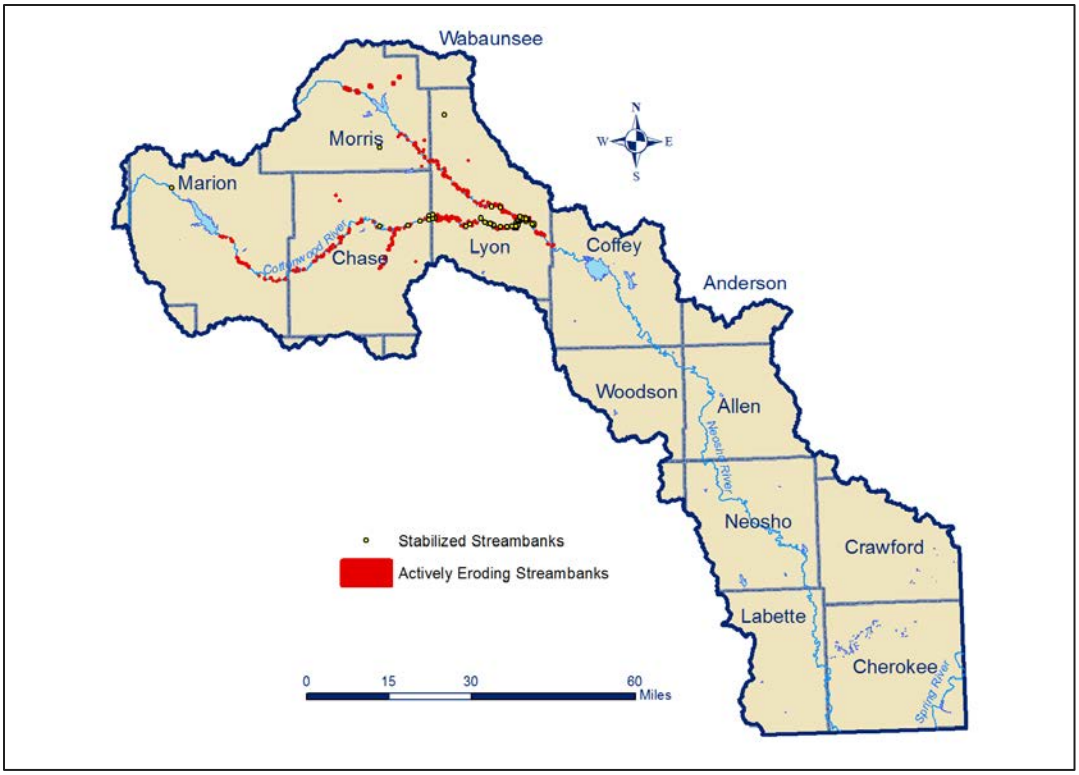


Figure 17: Neosho Regional Planning Area streambank stabilization projects

The majority of the sedimentation rate within in the Neosho Region is primarily due to streambank erosion above each reservoir. Currently, there are 363 streambank hotspots above the three federal reservoirs in the region and 41 of these sites have been stabilized, reducing the sediment load by an estimated 192,400 tons per year. There are 322 sites that remain to be completed and if completed, will reduce the sediment load by an additional estimated 345,000 tons per year (Figure 17).

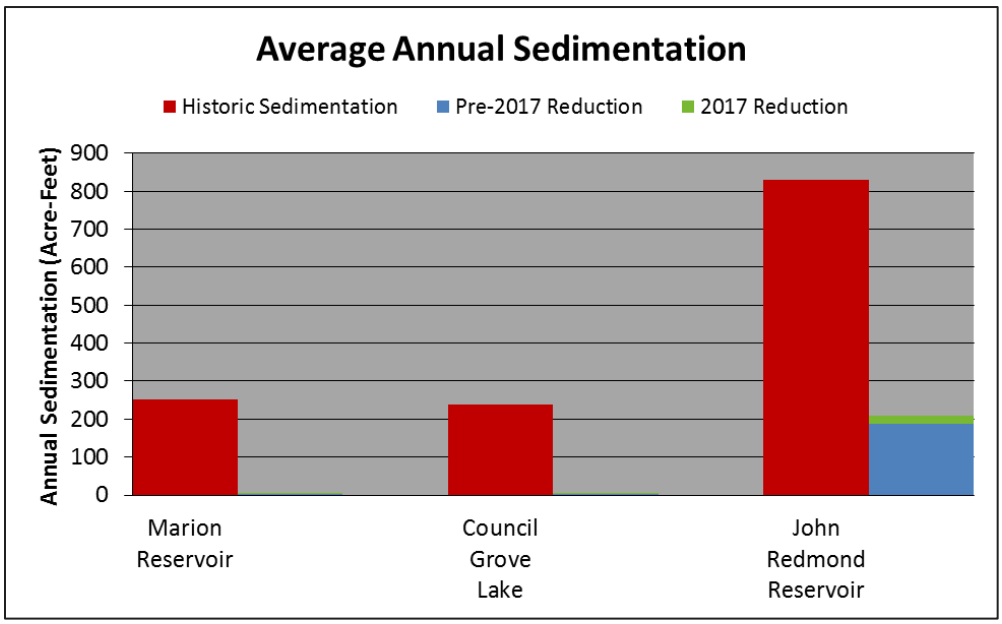


Figure 18: Average annual sedimentation in Neosho Region reservoirs

Figure 18 shows the average annual sedimentation, estimated using the change in conservation storage between bathymetric surveys, compared to the estimated sediment load reduction due to BMP and stream stabilization project implementation in the watersheds above the Neosho River basin federal reservoirs.

The estimated annual reductions compare total implementation prior to 2017 (beginning in 2004) to reduction in 2017. The results show John Redmond Reservoir has the highest historical sedimentation rate of nearly 830 acre-feet per year, but also has the highest estimated sediment reduction.

Prior to 2017, 85% of the average annual sedimentation reduction occurred from implementing streambank stabilization projects, while 15% occurred from the implementation of BMPs. In 2017, 63% occurred from streambank stabilization projects and 37% from implementation of BMPs, respectively.

Figure 19 shows the change in reservoir sedimentation from the implementation of load reduction practices. Results show the most significant reductions in the John Redmond Reservoir watershed, accounting for more than 25% of the annual sedimentation. However, the estimated load reduction from implemented practices for all lakes only accounts for a small fraction of the total historical sedimentation.

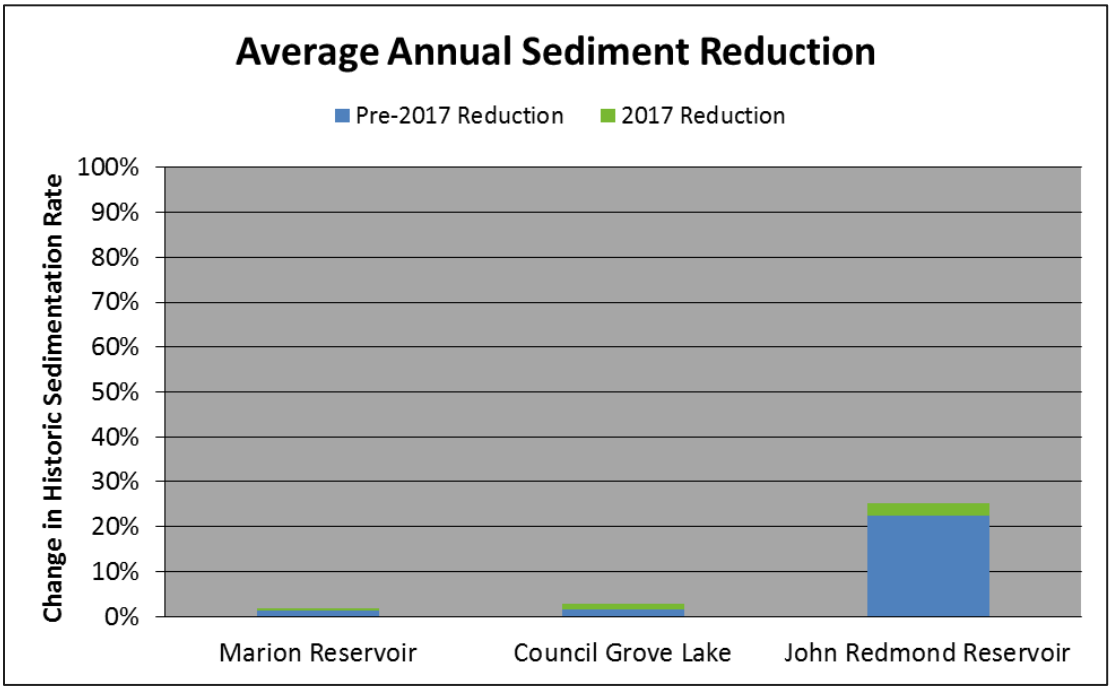


Figure 19: Average annual sediment reduction in Neosho Region reservoirs

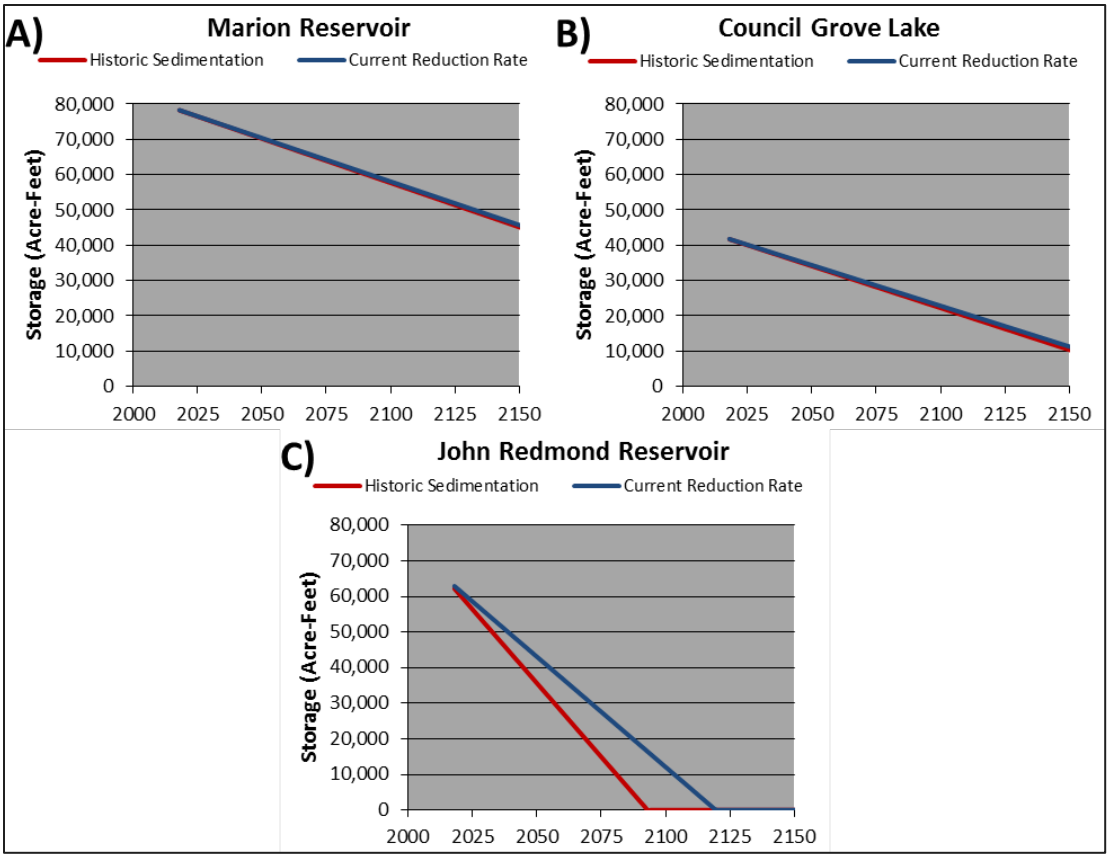


Figure 20: Reservoir capacity at conservation pool Neosho Region reservoirs

The benefits of sediment reduction practices are shown in Figure 20, extending the lifetime of John Redmond Reservoir from 2094 to 2120. However, other reservoirs are relatively unchanged from their historical sedimentation rate.

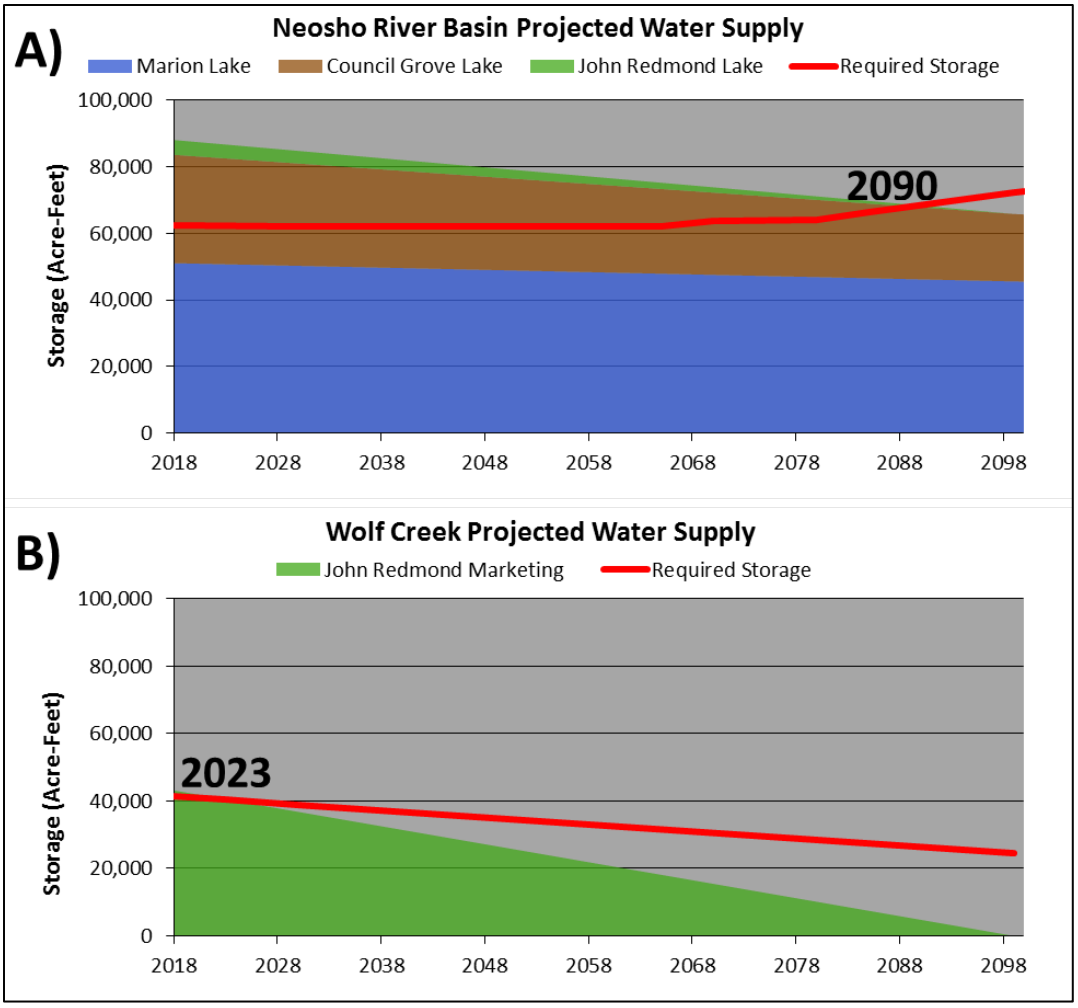


Figure 21: Marais des Cygnes Region projected water supply storage

Figure 21 shows the projected water supply storage given the historic rate of reservoir sedimentation based on the change in bathymetric surveys (earliest survey versus most recent survey), along with the storage required to meet the system's demands and targets. The supply/demand analysis was separated into Wolf Creek Nuclear Operating Corporation (WCNOC) use from John Redmond Reservoir Marketing storage and other water users in the basin taking from assurance and marketing storage.

The analysis was performed using current system operations using a Neosho River basin model which simulated historic hydrologic conditions between 1950 and 2014, allowing for an estimate of required storage. Given the projected sedimentation and demands, results indicate that John Redmond Reservoir Marketing storage will be insufficient to fully meet projected demands through a 1950's type drought for WCNOC by the year 2023 and storage for the remainder of the basin would be insufficient by 2090.

Zebra Mussels

Zebra mussels, one of the Aquatic Nuisance Species (ANS) affecting Kansas waters, are found in all the federal reservoirs within the Neosho Region. Smaller county and Public Water Supply (PWS) lakes are also infested. Unfortunately ANS affect the quality of water and recreational opportunities within the

state. The Kansas Department of Wildlife, Parks, and Tourism (KDWPT) has worked diligently on their ANS education and management plan in order to mitigate the ANS problem and work to slow the spread of them. The final Kansas ANS Plan is located on the KDWPT website.

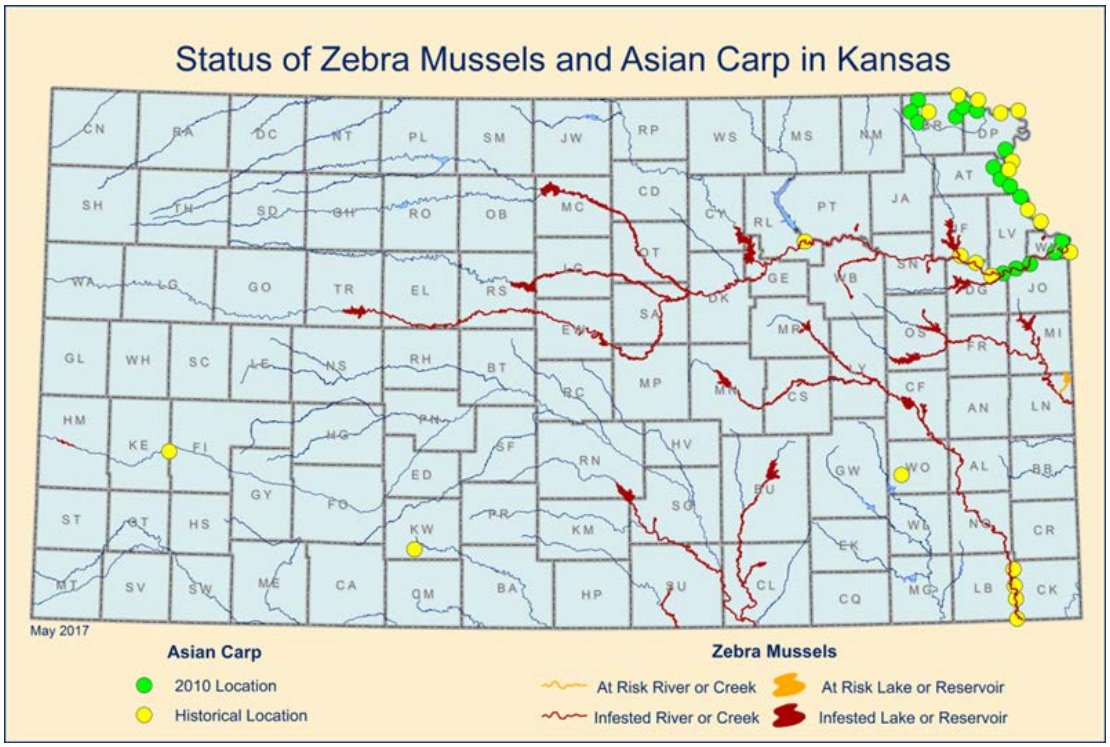


Figure 22: Status of Zebra mussels and Asian carp in Kansas

Implementation Progress

As noted in the goals for the Neosho Region, implementation of the RAC plans is critical. In order to reduce sediment loads entering public water supply reservoirs and to ensure adequate supply for the region, progress must be made in the efforts to accomplish these goals. In the past year, the following actions have been taken:

The KWO modeling for the region has started utilizing the MEKRO model. MEKRO is a hydrologic model utilized by the KWO to assess the operational capability and physical adequacy of the reservoir and surface water systems in Kansas. Inputs to the model include historic inflows, reservoir storage capacities, system demands, and downstream target flows. The model is a planning tool that enables KWO staff and others to evaluate the effects of operational changes, reservoir improvements, reservoir sedimentation, and demand modifications that could impact each individual basin system in Kansas.

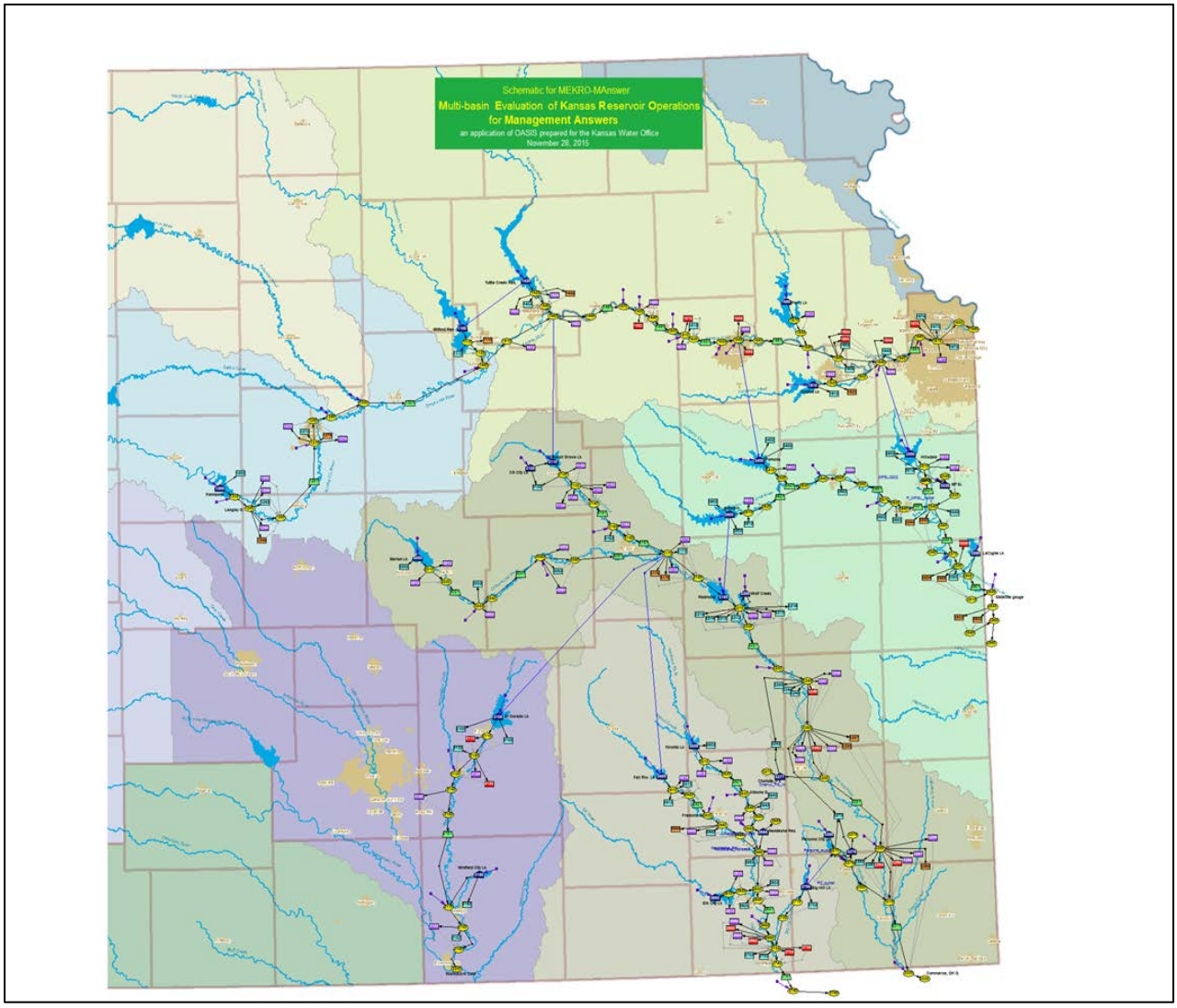


Figure 23: Multi-basin Evaluation of Kansas Reservoir Operations (MEKRO)

To showcase the capabilities of the model, and to receive RAC input, a Drought Workshop was held in September 2017. Based on this workshop, continued use and refinement of the model, drought scenarios can be evaluated to create plans and strategies to mitigate and manage drought conditions. The Neosho RAC has initiated work with the KWO, and will continue to use the model, in order to evaluate pool rises in Marion, Council Grove, and John Redmond reservoirs. Using this model to ensure the best possible information is used as inputs, the region's population projections will be evaluated for their supply needs to ensure the demand can be met and exceeded by 10% through the year 2050.

With much of the region’s sediment due to eroding streambanks, hotspots have been identified by the KWO. Utilizing a Streambank Team, comprised of members from the KWO, KDHE, and KDA-DOC, streambank hotspots are systematically being evaluated and stabilized. Currently, streambank stabilization projects are funded through the DOC, Kansas Water Pollution Control Revolving Loan Fund (KDHE), Environmental Protection Agency (EPA) 319 Program, Kansas State Water Plan Fund, John Redmond Dredging Bond Authority Funds, and KWO Water Marketing Program Funds.

To address the HAB issue at Marion Reservoir, the Neosho RAC is coordinating with state and federal agencies, as well as the Grand River Dam Authority (GRDA) in Oklahoma. These agencies will work together to evaluate the possibility of studying the entire region and securing funding for the study and HAB related work with the region.

Implementation Needs

While the Neosho RAC has begun to address the water supply and water quality concerns within the region, continued work needs to be completed. With the Kansas Water Authority's (KWA) approval of the RAC's plans of action, the following items need to be addressed or continued to be addressed:

- Continued systematic identification and stabilization of streambank hotspots located above federal reservoirs containing water supply storage
    - The Streambank Team comprised of members from the KWO, KDHE, and DOC will be tasked with this
    - Evaluate the amount of sedimentation reduced to verify the effectiveness of stabilizing streambanks, as well as to understand that future load reductions needed
    - Conduct a bathymetric survey of John Redmond Reservoir
    - Additional funds will need to be secured to continue to stabilize streambanks, evaluate their effectiveness, and to conduct a bathymetric survey for John Redmond Reservoir
- Implementation and evaluation of BMPs to understand the amount of sedimentation reduced to date, as well as future load reductions needed
- Incorporate components of BMP implementation into a Water Quality Technology Farm within the Neosho Region. The following items will need to be addressed for the establishment of the farm:
    - Funding: State and Local
    - Producer identification
    - Water quality parameters identified
- MEKRO modeling of the region to evaluate supply and demands during drought conditions. The RAC and KWO have begun utilizing the model to evaluate supply and demand by region, including the evaluation of siting a small water supply reservoir in the lower portion of the region. Continued development of the model's capabilities will need to be addressed. The evaluation of calling-in unallocated storage and pool raises will be evaluated for feasibility and cost. The assessment of supply and demand projections needs to be conducted to ensure accurate model inputs
- Evaluation of the work being conducted at Milford Lake in reference to HABs. Success at Milford can be possibly applied to Marion Reservoir in order to reduce HAB frequency
- Continued and additional coordination with local, state, and federal entities to evaluate the need and ability to increase storage in the region

Conservation practice implementation continues to be necessary to reduce nutrient and sediment runoff impacting the surface waters of the Neosho Region. Progress made within the region can be

compared to the remaining needs identified to quantify the overall financial need to fully implement watershed plans in this region (Table 3). These figures include costs associated with conservation practice implementation, as well as technical assistance needs to help landowners implement conservation practices. Overall, the total remaining need to fully implement WRAPS watershed plans for the region is $18.5 million.

Table 3: 2017 costs by region

RAC Area	Number of plans	State Interest Priority Score Rank	Updated Information and Education Costs	Updated Total Livestock and Cropland Plan Costs	Updated Technical Assistance Plan Costs	Updated Total Implementation Plan Costs
	(8) Plans					
Neosho	Cottonwood	2	$8,452,481.55	$31,158,296.65	$6,309,783.00	$4,656,027.90
	Twin Lakes	7	$1,629,600.00	$4,754,665.07		$1,372,000.00
	Middle Neosho	4	$6,362,998.35	$52,614,720.20		$3,223,406.05
	Marion	11	$1,423,700.00	$11,402,181.92		$460,000.00
	Upper Neosho	27	$2,858,084.50	$35,390,817.40		$1,432,625.65
	Neosho Headwaters	24	$1,802,871.90	$2,173,538.70	$869,397.00	$1,366,355.70
	Spring River	30	$1,702,350.00	$4,629,838.50		$4,050,000.00
	Eagle Creek	21	$608,211.00	$3,823,849.80		$1,886,298.30
Total	**Total**		**$24,840,297.30**	**$145,947,908.24**	**$7,179,180.00**	**$18,446,713.60**

Regional Goals & Action Plan Progress

While *The Vision* provides a framework for the management of the state's water supply overall, regional goals identify and address issues at the local level. In 2015, Regional Goal Leadership Teams were developed for each of the 14 regional planning areas which were comprised of local water users along with input from area stakeholders to help develop regional water supply goals. These goals were adopted by the KWA in August of 2015 and at that same time members for the 14 RACs were appointed. The first task for the newly formed RACs was to develop action plans to correspond with the regional goals. The Neosho RAC completed action plans for their regional goals in fall of 2016. Information included within this section highlights recent progress made on regional goal action plan implementation.

Regional Goal #1	Goal Theme	Annual Progress			
		2017	2018	2019	2020

Prolong the water supply storage in John Redmond Reservoir to the year 2065 by reducing the sedimentation rate by an average of 300 acre-feet per year through watershed practices such as no-till, filter strips and streambank stabilization. By 2025, all streambank hotspots will be stabilized. By 2030, 80% of the priority cropland in need of conservation will be treated with no-till practices.	Water Supply and Storage			--	--

Progress Legend	Not Started	In Progress	Delayed	Cannot Complete	Complete

2018 Update:

- 41 streambank stabilization projects have been completed, while more are currently being planned and will be in construction in 2018
- A WQTF is currently being discussed with potential landowners & KSU
- Funding for BMP implementation is actively being sought to fund projects in the Neosho Region

Next Step(s):

- Continuation of streambank stabilization projects
- Secure landowner commitment and private industry funding to implement a WQTF
- Secure funding for BMP implementation in the Neosho Region for FY18 & FY19 through the State Water Plan Fund

Regional Goal #2	Goal Theme	Annual Progress			
		2017	2018	2019	2020
Reduce vulnerability to drought by the increasing reservoir storage at Marion and Council Grove Reservoirs through a permanent raise in conservation pool elevation. By 2025, evaluate the feasibility of permanent conservation pool rise at Marion and Council Grove Reservoirs. Based on the outcome and findings of the feasibility study, stage increases in permanent pool elevation based on supply needs. Ensure water supply available from storage exceeds projected demand by at least 10% through the year 2050.	Water Supply and Storage		--	--	--

Progress Legend	Not Started	In Progress	Delayed	Cannot Complete	Complete

2018 Update: KWO is modeling the region to see if a reallocation study will need to be conducted or if changes in

reservoir management need to be made.
Next Step(s): Update model

Regional Goal #3		Goal Theme	Annual Progress			
			2017	2018	2019	2020
Reduce frequency of algal blooms in Marion Reservoir to no more than every 3 years through 2035. Evaluate the role of water level fluctuations in remediating and reducing algal bloom frequency.		Algal Blooms		--	--	--
Progress Legend	Not Started	In Progress	Delayed	Cannot Complete		Complete
2018 Update: Meetings with KDHE, KBS, USGS, USACE, and GRDA have been conducted to discuss collaboration possibilities to study HABs and implement strategies to reduce their frequency.						
Next Step(s): Additional meetings with KDHE, KBS, USGS, USACE, and GRDA will be conducted in spring and summer and fall of 2018 to secure funding and discuss and study parameters.						

Regional Goal #4		Goal Theme	Annual Progress			
			2017	2018	2019	2020
Increase storage in basin below John Redmond through development of additional storage sites. By 2020, complete an assessment of potential reservoir sites in lower portion of the Neosho planning region; including potential off-stream storage sites.		Water Storage		--	--	--
Progress Legend	Not Started	In Progress	Delayed	Cannot Complete		Complete
2018 Update: Demand in the lower Neosho is being evaluated						
Next Step(s): Demand evaluation will be finalized						

Regional Goal #5	Goal Theme	Annual Progress			
		2017	2018	2019	2020
Every five years, assess the effectiveness of BMPs for effects on hydrology, reduction of sediment and nutrient, and provide that information and education to those implementing practices. Assessments may include off-stream storage for sediment and nutrient trapping, overland erosion	Research and Education		--	--	--

and nutrient sequestration, in reservoir sediment and nutrient movement and re-suspension, and landscape scale watershed modeling project.						
Progress Legend	Not Started	In Progress	Delayed	Cannot Complete	Complete	
2018 Update: The RAC determined this goal is being met as the other goals are being implemented.						
Next Step(s): Goal is progressing as the others goals are implemented.						

References

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"Lake Level Management Plans Water Year 2018." *Kansas Water Office*, kwo.ks.gov/docs/default-source/reservoirs/rpt_llmp_wy2018_101217_tj_formattedd1f0e11da40b6667970cff000032a16e.pdf?sfvrsn=0.

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