

Kansas-Lower Republican River Basin Management Categories

January 2009

WATER MANAGEMENT CATEGORIES

The following categories include issues identified in the [Kansas-Lower Republican basin](#) plan as items that require attention in addition to the basin priority issues. These issues are addressed within the following management categories:

- Water Management
- Water Conservation
- Public Water Supply
- Water Quality
- Wetland and Riparian Management
- Flood Management
- Water-Based Recreation

These categories also correspond to the statewide management categories and policies of the *Kansas Water Plan* found in [Volume II](#). These documents contain new policy issues and the existing policy and statutory framework that relate to the management categories.

ISSUE: WATER MANAGEMENT

See the [Water Supply Management and Conservation priority issue](#) in the Kansas-Lower Republican basin section.

Applicable *Kansas Water Plan* Objectives

- Achieve sustainable yield management of Kansas surface and ground water sources outside of the High Plains Ogallala aquifer and areas specifically exempt by regulation. Sustainable yield management would be a goal that sets water management criteria to ensure long-term trends in water use will move as close as possible to stable ground water levels and maintenance of sufficient streamflows.
- Meet minimum desirable streamflow (MDS) at a frequency no less than the historical achievement for the individual sites at time of enactment.

Applicable Programs

The following programs help to meet the objectives in the Water Management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- USDA-Natural Resource Conservation Service: Envi-

- ronmental Quality Incentive Program
- Kansas Water Office: Water Marketing Program
- Kansas Water Office: Water Assurance Program
- U.S. Army Corps of Engineers: Missouri River Reservoir Control Program

ISSUE: WATER CONSERVATION

Water conservation is essential for the effective management of water resources in the basin to assure that a sufficient, long-term supply of water is available for beneficial uses. Conservation is defined as a careful preservation and protection of something, especially the planned management of a natural resource to prevent exploitation or destruction. Water conservation is a part of maintaining a long-term water supply for Kansas. Water conservation activities apply to all uses: irrigation, municipal, industrial, etc, and from all sources. Irrigation (45%), municipal (39%), and industrial uses (8%) account for the majority of [water used](#) in the basin.



Bowersock Dam on the Kaw River at Lawrence.
Photo courtesy Kansas Geological Survey

Water use conservation plans are required for anyone: a) purchasing water from the Water Marketing Program, b) participating in the Water Assurance District Program, c) sponsoring or purchasing the public water supply portion of a Multipurpose Small Lakes Program project, d) transferring water under the Water Transfers Act and e) applying for a loan from the Public Water Supply Loan Fund. Out of the 190 [public water suppliers](#) in the basin, 132 had developed municipal water conservation plans as of 2006. All plans should be updated to incorporate the changes in the [2007 Municipal Conservation Plan Guidelines](#).

Kansas-Lower Republican River Basin Management Categories

January 2009

Water conservation plans include drought stage triggers that are the signals that a water shortage or other conditions indicative of drought have reached certain stages or levels. They act as the signal to begin implementation of actions appropriate to the stage. Triggers may be related to supply conditions or demand levels. A given stage should have more than one trigger to confirm that conditions are worsening. Appropriate conservation practices in the areas of education, management and regulation should be listed under each stage. Delay in action may lead to a major disruption of the water supply system at a later time.

Most water utilities consider water as a commodity and encourage the use of water by their customers by striving to keep rates low. The availability of plentiful inexpensive water is promoted by communities in attracting new growth. More recently, communities are adopting rate structures that result in increased cost with increased use. This is one form of demand management.

The four basic types of water rate structures used by public water suppliers in Kansas are described as flat rate, decreasing block rate, uniform block rate, and increasing block rate. Utilities with a flat rate charge each customer a fixed amount per month regardless of the amount of water used. With a decreasing block rate, the unit cost of water decreases as usage increases. The unit cost of water is the same for all levels of usage with a uniform block rate. With an increasing block rate, the unit cost of water rises as usage increases.

The type of rate structure can affect usage as measured in gallons per capita per day (gpcd). Systems with flat rates tend to use considerably more water per capita than systems that meter customer use. The other three types of rate structures, in which cost depends on

amount of water used, have a less dramatic effect on gpcd. Decreasing block rates are assumed to discourage conservation because customers are charged lower rates for high-volume usage. Increasing block rates are considered an effective way to promote conservation among high-volume users while keeping the cost of moderate use affordable. However, the type of rate structure does not appear to influence usage by individual customers as much as the total monthly water cost and the geographic area in which they live.

Applicable Kansas Water Plan Objectives

- All non-domestic points of diversion meeting predetermined criteria will be metered, gaged, or otherwise measured.
- Conservation plans will be required for water rights meeting priority criteria under K.S.A. 82a-733 if it is determined that such a plan would result in significant water management improvement.

Applicable Programs

The following programs help to meet the objectives in the Water Conservation management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- Kansas State University Research and Extension: Water Conservation and Management Program
- Kansas Department of Health and Environment: Kansas Public Water Supply Loan Fund
- Kansas Water Office: Water Conservation Program
- USDA-Farm Service Agency: Conservation Reserve Program

ISSUE: PUBLIC WATER SUPPLY

See also, [Surface Water Management and Conservation priority issue](#) in the Kansas-Lower Republican basin section.

The primary approach to addressing public water supply issues in the basin focuses on ensuring that there are adequate supplies of [surface](#) and ground water within the basin to meet future water demands, reducing the number of public water supply systems that are vulnerable to drought, and ensuring that systems have the technical, financial and managerial capacity to meet future needs for water quality and quantity.



Tuttle Creek Reservoir. Photo Courtesy Kansas Water Office

Kansas-Lower Republican River Basin Management Categories

January 2009

There are 190 [public water suppliers](#) in the basin, including 60 rural water districts. The WaterOne (Johnson County) water district formed under specific statutory authority in 1961. There is one Public Wholesale Water Supply District operating in the basin. Ground water is the primary source for water use in the basin accounting for more than 53% of the total supply. There are four multipurpose small lakes in the basin. The Kansas River Water Assurance District is also active in the basin. The U.S. Army Corps of Engineers (Corps) operates Milford, Tuttle Creek and Perry lakes in coordination with the state to meet water assurance district member needs during periods of low flow.

Water usage (gpcd) is calculated for each water system in the state from reported data on water use and population served. Average gpcd figures for large, medium and small water suppliers are calculated in eight regions of the state based on similar geographic areas. The Kansas-Lower Republican basin is primarily located in regions 7 and 8 and a small portion of region 6. Average gpcd for large, medium and small suppliers in region 7 are 148, 107 and 96, respectively. Average gpcd in region 8 are 130, 102 and 84 for large, medium and small suppliers. This serves as a reference to indicate if individual suppliers are above or below average usage for the region.



Clinton Dam, on the Wakarusa River. Photo courtesy KGS.

Reducing “unaccounted for” water is a focus of water conservation efforts in the Kansas-Lower Republican basin. Unaccounted for water includes any unmetered uses plus water loss in the distribution system. Technical assistance is available through the Kansas Water Office (KWO) for systems with more than 30% unaccounted for water. High amounts of unaccounted for water may result from water line breaks, under registering customers,

unmetered uses, faulty metering or inaccurate accounting. The statewide average percentage of unaccounted for water use in 2006 was 14%. Management of unaccounted for water is a fundamental tool in providing adequate water supply.

Drought vulnerable water supplies are those systems most likely to be the first ones impacted by drought due to basic source, distribution system or treatment capacity limitations; or that rely on a single well as a water supply source. Drought vulnerable water supplies were surveyed by the Kansas Department of Health and Environment (KDHE) and KWO in 2003 and 2006. The number of public water supplies considered drought vulnerable decreased from 23 to 21 between the two surveys. The KDHE Capacity Development Program has been beneficial in reducing drought vulnerability throughout the state as communities assess their systems and identify areas in need of improvement.

Capacity development is the process of water systems acquiring and maintaining adequate technical, financial and managerial (TFM) capabilities to assist them in providing safe drinking water. The capacity development provisions in the Safe Drinking Water Act provide a framework for the state and public water supply systems to work together to help ensure that systems acquire and maintain the TFM capacity needed to meet the public health protection objectives.

KDHE surveyed public water suppliers TFM capability in 2002, 2005, and 2008. The surveys provided information for a ranking system of high, medium and low for targeting the need for capacity development assistance. In the Kansas-Lower Republican basin, the number of systems rated high for the need of capacity development increased from 17 to 23 between 2002 and 2005 reports (2008 results pending).

Applicable *Kansas Water Plan Objectives*

- Ensure that sufficient surface water storage is available to meet projected year 2040 public water supply needs for areas of Kansas with current or potential access to surface water storage.
- Less than five percent of public water suppliers will be drought vulnerable.
- Ensure that all public water suppliers have the TFM capability to meet their needs and to meet Safe Drinking Water Act requirements.

Kansas-Lower Republican River Basin Management Categories

January 2009

Applicable Programs

The following programs help to meet the objectives in the Public Water Supply management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- Kansas Department of Health and Environment: Public Water Supply Program
- Kansas Water Office: State Water Planning Program
- Kansas Water Office: Water Conservation Program

ISSUE: WATER QUALITY

Water quality is addressed through a combination of restoration and protection efforts using both voluntary, incentive-based approaches and regulatory programs (see [Watershed Restoration and Protection basin priority Issue](#)).

Applicable Kansas Water Plan Objectives

- Reduce the average concentration of bacteria, biochemical oxygen demand, solids, metals, nutrients, pesticides and sediment that adversely affect the water quality of Kansas lakes and streams.
- Ensure that water quality conditions are maintained at a level equal to or better than year 2000 conditions.
- Reduce the average concentration of dissolved solids, metals, nitrates, pesticides and volatile organic chemicals that adversely affect the water quality of Kansas ground water.
- Maintain, enhance, or restore priority wetlands and riparian areas.
- Nutrient reduction goals will be included in all Watershed Restoration and Protection Strategies (WRAPS) projects within the basin.
- All public water suppliers will complete and implement a source water protection plan.

Applicable Programs

The following programs help to meet the objectives in the Water Quality management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Health and Environment: Watershed Management Section/WRAPS
- Kansas Department of Health and Environment: Wa-

- Watershed Planning Section/TMDL Program
- Kansas Department of Health and Environment: State Water Plan Program (Contamination Remediation)
- Kansas Corporation Commission: Conservation Division Programs
- Kansas Department of Health and Environment: Local Environmental Protection Program
- State Conservation Commission: Nonpoint Source Pollution Control Program
- State Conservation Commission: Water Resources Cost-Share Program

ISSUE: WETLAND AND RIPARIAN MANAGEMENT

The primary approach to wetland and riparian management in the basin focuses on providing technical and financial assistance to landowners to protect and restore these resources in priority watersheds through the implementation of best management practices (BMPs). See the [Watershed Restoration and Protection basin priority issue](#) for a discussion of current activities concerning wetland and riparian area protection.

Applicable Kansas Water Plan Objectives

- Maintain, enhance or restore priority wetlands and riparian areas.

Applicable Programs

The following programs help to meet the objectives in the Wetland and Riparian Management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Forest Service: Forest Stewardship Program and Conservation Tree Planting Program
- State Conservation Commission: Riparian and Wetland Protection Program
- Kansas Water Office: State Water Planning Program
- Kansas Department of Wildlife and Parks: State Parks and Wildlife Areas Planning and Development
- Kansas Department of Wildlife and Parks: Wildlife Habitat Improvement Program
- State Conservation Commission: Kansas Water Quality Buffer Initiative

ISSUE: FLOOD MANAGEMENT

The primary approach to flood management in the basin focuses on floodplain management through community participation in the National Flood Insurance Program

Kansas-Lower Republican River Basin Management Categories

January 2009

(NFIP) and the reduction of rural flood damages through the construction of watershed dams within organized watershed districts.

The basin has 26 communities (cities and counties) participating in the NFIP (2003). Four communities have been suspended from the Program and 11 communities with identified flood hazard areas do not participate. There are 16 active [watershed districts](#) in the basin.

Applicable Kansas Water Plan Objective

- Reduce the vulnerability to damage from floods within identified priority communities or areas.

Applicable Programs

The following programs help to meet the objectives in the Flood Management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Structures Program/Floodplain Management
- State Conservation Commission: Watershed Dam Construction Program
- State Conservation Commission: Watershed Planning Assistance Program
- Kansas Division of Emergency Management: Hazard Mitigation Grants Program
- FEMA: National Flood Insurance Program

ISSUE: WATER-BASED RECREATION

The state's rivers, streams and lakes represent a valuable recreational resource. Consideration of water based recreation issues, problems and concerns are addressed in the [Water-Based Recreation Policy Section](#). Although the basin contains more federal reservoirs, state parks and community lakes than any other in Kansas, there is a demand for more water-based recreation facilities to meet the needs of the large population.

The Kansas River is one of the three rivers in the state considered open for public access. While additional access points have been developed, maintenance remains a challenge.

Applicable Kansas Water Plan Objective

- Increase public recreational opportunities at Kansas lakes and streams.

Applicable Programs

The following programs help to meet the objectives in the Water-Based Recreation management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Wildlife and Parks: Rivers and Stream Access
- Kansas Department of Wildlife and Parks: Community Fisheries Assistance Program
- Kansas Water Office: State Water Planning Program

ISSUES FOR FUTURE ACTION

- Regional public water supply coordination.
- Invasive species (zebra mussel) control and management.



Perry Reservoir. Photo courtesy Dennis Schwartz