

# Missouri River Basin Management Categories

January 2009

## WATER MANAGEMENT CATEGORIES

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

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

These categories 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

The mainstem of the Missouri River and the glacial aquifer are the major sources of water supply in the basin. All the major streams in the basin are open to new appropriations. There are no sites in the basin where minimum desirable streamflows have been set.

Flows in the Missouri River are influenced by management of several mainstem reservoirs in Montana and the Dakotas. These reservoirs are operated by the U.S. Army Corps of Engineers for flood control, navigation and other purposes in accordance with the *Missouri River Master Manual*.



Missouri River from Benedictine College. Photo courtesy KGS

## Applicable Kansas Water Plan Objectives

- Achieve sustainable yield management of Kansas surface and ground water sources outside of the

Ogallala-High Plains 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.

## Applicable Programs

The following programs help to meet the objectives in the [Water Management](#) (quantity) 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 Geological Survey and Kansas Department of Agriculture-Division of Water Resources: Water Well Measurement
- U.S. Army Corps of Engineers: Missouri River Reservoir Control Program
- USDA-Natural Resources Conservation Service: Environmental Quality Incentive 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 the beneficial uses of the people of the state. 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 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. Municipal water supply (92%) accounts for the majority of [water used in the basin](#). Industrial and irrigation each represent one percent of water use with stock water and other uses making up six percent (2006).

Eighteen [public water suppliers](#) in the Missouri basin have approved municipal conservation plans. Plans for two suppliers were developed based on guidelines from 1986 with the remainder based on the 1990 guidelines. All these plans should be updated to incorporate the changes in the *2007 Municipal Water Conservation Plan Guidelines*.

Water conservation plans include drought stage triggers that are the signals that a water shortage or other condi-

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tions 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 often promoted by communities to attract new growth. More recently, some communities have adopted rate structures that result in higher unit 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 water usage as measured in gallons per capita per day (gpcpd). Systems with flat rates tend to use considerably more water per capita than systems that meter customer use. The other

three types of rate structure, in which cost depends on amount of water used, have a less dramatic effect on gpcpd. Decreasing block rates are assumed to discourage conservation because customers are charged lower rates for high-volume usage. Increasing block rates are consid-

## 2007 Kansas Municipal Water Conservation



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ered 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 does 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 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 Water Office: Water Conservation Program
- Kansas Department of Health and Environment: Kansas Public Water Supply Loan Fund
- USDA-Farm Services Agency: Conservation Reserve Program

### ISSUE: PUBLIC WATER SUPPLY

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.

There are 32 [public water suppliers](#) in the basin, including 13 rural water districts. There are currently no public wholesale water supply districts in the basin; however, negotiations are in progress to develop a district along with a portion of the Kansas River basin. [Surface water](#) is the primary source for most public water supplies, accounting for more than 93% of the total supply. There is one state multipurpose small lake in the basin which serves as the water supply for the City of Sabetha. Water from Pony Creek Reservoir is piped across the Mis-

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souri basin watershed boundary to Sabetha, which is located just south of the basin.

Water usage in 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 [Missouri basin](#) is located in region 8 with an average gpcd of 130, 102 and 84 for large, medium and small suppliers, respectively. This serves as a reference to indicate if individual suppliers are above or below average usage for the region.

Reducing “unaccounted for” water is a focus of water conservation efforts in the Missouri 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 meters, 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 public 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. The KWO and the Kansas Department of Health and Environment (KDHE) identified drought vulnerable water suppliers in 2006. Three public water supplies were considered drought vulnerable in the Missouri basin. 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.

## 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.
- Reduce the number of public water suppliers with excessive “unaccounted for” water by first targeting those with 30% or more “unaccounted for” water.
- Ensure that all public water suppliers have the tech-

nical, financial and managerial capability to meet their needs and to meet Safe Drinking Water Act requirements.

## Applicable Programs

The following programs help to meet the objectives in the Public Water Supply 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

See the [Watershed Restoration and Protection Priority Issue](#) for a discussion of current issues concerning water quality.

Water quality is addressed through a combination of restoration and protection efforts using both voluntary, incentive-based approaches and regulatory programs.

## 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 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 category. For more information on the programs and associated policies, see the [Programs](#)

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



Loess Hills, Doniphan County. Photo courtesy KGS

## **ISSUE: WETLAND AND RIPARIAN MANAGEMENT**

See the [Watershed Restoration and Protection Priority Issue](#) for a discussion of current activities concerning wetland and riparian area protection.

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.

The U.S. Army Corps of Engineers conducts the Missouri River Mitigation Program to restore habitats in the floodplain. See the [Increase Recreational Use and Access Priority Issue](#) for additional information on this program.

### **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 community participation in the National Flood Insurance Program and reduction of rural flood damages through construction of watershed dams within organized [watershed districts](#).

As of 2003, the basin had 19 communities (cities and counties) participating in the National Flood Insurance Program. One community has been suspended from the program and three communities with identified flood hazard areas do not participate. There are six watershed districts organized 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

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- State Conservation Commission: Watershed Planning Assistance Program
- Federal Emergency Management Agency (FEMA): National Flood Insurance Program
- Kansas Division of Emergency Management: Hazard Mitigation Grants Program

## ISSUE: WATER-BASED RECREATION

See the [Increased Water Recreation Use and Access Priority Issue](#) for a discussion of current activities concerning water-based recreation in the basin.

### Applicable *Kansas Water Plan Objectives*

- Increase public recreational opportunities at Kansas lakes and streams.

### Applicable Programs

The following programs help to meet the objectives in the Water-Based Recreation 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

- Increased public participation by federal, state and tribal entities in water management.
- Water management to maintain instream flows for fish, wildlife and their habitats.



Missouri Riverbank Catfishing Spot. Photo courtesy KGS