

Upper Arkansas River Basin Management Categories

WATER MANAGEMENT CATEGORIES

The following categories include issues identified in the [Upper Arkansas 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
- Flood Management
- Water-Based Recreation
- Wetland and Riparian Management

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

The Southwest Kansas Groundwater Management Districts (GMD) No. 3 (GMD3), the West Central Kansas GMD No. 1 (GMD1) and Big Bend GMD No. 5 (GMD5) are major local water management entities in the basin. Most townships in the basin are closed to new appropriations.

There are five organized [watershed districts](#) in the basin, including the Pawnee Watershed District, the largest watershed district in the United States.

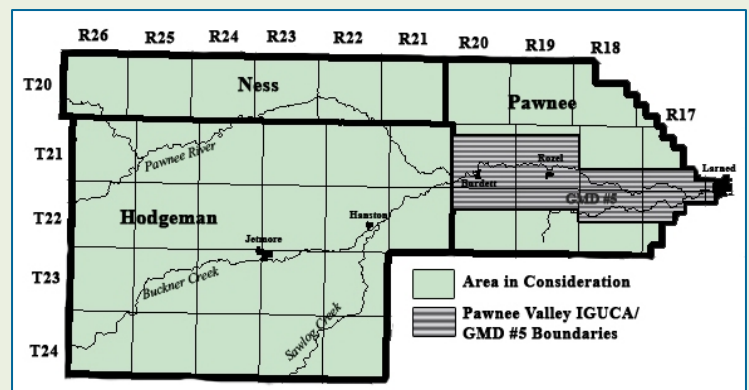
Minimum Desirable Streamflow (MDS) levels have been set for two sites in the basin: one near Great Bend and one near Kinsley. According to an assessment conducted by the Kansas Water Office (KWO) in 2006, both MDS gages in the basin have shown declines in the annual frequency, magnitude or duration of meeting MDS.

The *Kansas Water Plan* directed the need for further water resource management in the Pawnee River Valley. The Kansas Department of Agriculture-Division of Water Resources (DWR) Subbasin Water Resources Management Program began work with stakeholders in 1996 to evaluate the hydrologic properties of the alluvial valley and recommend long-term management strategies for the Pawnee Buckner subbasin. The committee recommended in their 2000 management proposal that the Chief Engineer amend the order establishing the Pawnee Valley Intensive Groundwater Use Control Area

(IGUCA) to include the part of the subbasin within Hodgeman and Ness counties, in addition to the area within Pawnee County, and require water resource management during drought conditions (Figure 1).

In 2007, the Chief Engineer gave an order to expand the boundaries of the Pawnee Valley IGUCA. A phase II hearing would identify the goals to be accomplished with the amended IGUCA, and the corrective control provisions.

An IGUCA has closed the Arkansas River corridor in Hamilton, Kearny, Finney, Gray and Ford counties to any further ground or surface water appropriations, and to prevent re-drilling a well closer to the river.



In 2006, the KWO calculated the median annual water level changes in wells from 1981 to 2005 GMD3. Based upon the assessment, the data indicates that sustainable yield has not yet been attained in GMD3.

On December 20, 2007, the U.S. Department of Agriculture (USDA)-Farm Service Agency, in partnership with the State Conservation Commission, began accepting applications to enroll land in the Conservation Reserve Enhancement Program (CREP). This voluntary program seeks to provide incentives and cost sharing to participants that enroll their land into eligible conservation practices such as native vegetation establishment or wildlife conservation for a period of 14 to 15 years. The CREP project area lies within 10 counties along the Arkansas River corridor, covering 1,571,440 acres. As of December 2008, nearly 8,200 acres were enrolled in the CREP program. For the acres enrolled into the CREP program, 16,479 acre feet of the authorized water quantity will be permanently retired from irrigation.

The GMD3 has contracted with the Kansas Geological Survey (KGS) to map the practical saturated thickness (PST) of the Ogallala-High Plains aquifer in their district. The PST, as determined primarily by well logs, is the net

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thickness of saturated sediments that significantly contribute to well yield from the water table down to the bedrock surface. It differs from the saturated thickness which is the total thickness of saturated sediments between the water table and the bedrock surface. The PST can provide a more accurate picture of water availability and may also provide insight into future water level trends at the scale of an individual well.

In 2007, the KWO, GMD3, and the U.S. Bureau of Reclamation (Bureau) contracted with the KGS for the development of a hydrologic model of the GMD3 region. The model will provide additional information on the water budget, and be able to project aquifer and streamflow responses to various future management scenarios.

Applicable Kansas Water Plan Objectives

- Reduce water level decline rates within the Ogallala aquifer and implement enhanced water management in targeted areas.
- Achieve sustainable yield management of Kansas surface and ground water sources outside of the 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 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 Quantity 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 Agriculture, Division of Water Resources, Subbasin Water Resource Management Program
- Kansas Geological Survey, Kansas Department of Agriculture-Division of Water Resources: Water Well Measurement
- Kansas Water Office and U.S. Bureau of Reclamation: Assessment and Evaluation Program/Ogallala Special Study Phase II, Cooperative Agreement
- Kansas Water Office: State Water Planning Program
- Kansas Geological Survey: High Plains Aquifer

Technical Assistance Program

- Kansas Geological Survey: Stream Aquifer Interactions
- USDA-Natural Resources Conservation Service: Environmental Quality Incentive Program (EQIP)
- USDA-Farm Services Agency: Conservation Reserve Enhancement 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 in Webster Dictionary 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 accounted for nearly 95% of all reported water pumped or diverted in the basin. Municipal use accounted for two percent of water used in the basin, industry one percent, while recreation, stockwater and other uses combined equaled about two percent (2006 water use reports).

Of the 614 [public water suppliers](#) in Kansas that have an approved conservation plan in place as of December 31, 2008, 43 plans have been approved in the Upper Arkansas basin. Three hundred and twenty one plans have been approved for irrigation water rights. The number of diversion points in western Kansas that reported irrigation application rates over the regional average decreased during the period from 1991

to 2005. Of the total number of wells in the Upper Arkansas basin that were reported to have diverted water in 2006, more than 90% had meters.

2007 Kansas Municipal Water Conservation



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The DWR Subbasin Water Resources Management Program began work with stakeholders in 1998 in the Middle Arkansas basin to address water concerns. In 2004, the team created water management strategies, which they presented to the Chief Engineer. These include encouragement of a 10% water use reduction, based from the 1988–2000 water use reports, as well as development of water conservation plans. The KWO and DWR contracted with the KGS for development of a hydrologic model of the Middle Arkansas subbasin. The computer model was able to provide information on the water budget and project aquifer and streamflow responses to various future conditions and possible management scenarios (Figure 2).

Applicable Kansas Water Plan Objectives

- Reduce the number of public water suppliers with excessive unaccounted for water by first targeting those with 30 percent or more unaccounted for water.
- Reduce the number of irrigation points of diversion for which the amount of water applied in acre-feet per acre (AF/A) exceeds an amount considered reasonable for the area.
- 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

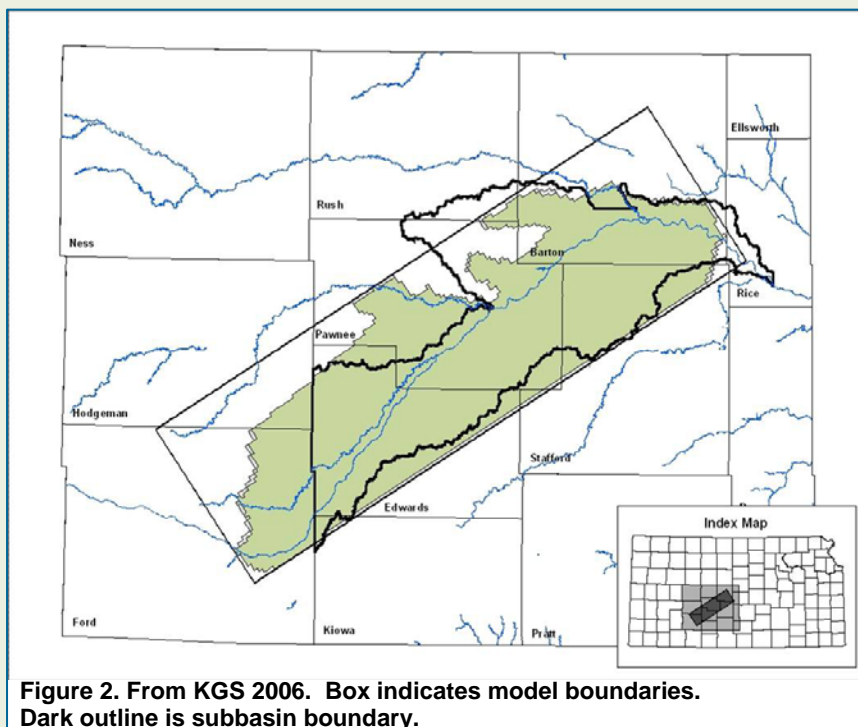
The following programs help to meet the objectives in the Water Conservation management category. For more information on the programs and associated policies, see the [Programs Manual](#).

- Kansas Department of Agriculture-Division of Water Resources: Water Appropriation Program
- Kansas Department of Agriculture-Division of Water Resources: Subbasin Water Resources Management Program
- Kansas State University Research and Extension: Water Conservation and Management Program
- State Conservation Commission: Water Resources Cost-Share Program
- Kansas Water Office: Water Conservation Program
- Kansas Water Office: State Water Planning Program
- Kansas Water Office: Weather Modification Program

- USDA-Natural Resources Conservation Service: Environmental Quality Incentive Program (EQIP)
- USDA-Farm Service 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 46 [public water suppliers](#) in the basin, including two rural water districts. There are no public wholesale water supply districts in the basin. Ground water is the primary source for most public water supplies, accounting for 96% of the total supply.

Coping with drought presents a challenge for public water suppliers. During drought periods, the amount of raw water available typically is reduced at the same time customer demand for water increases. Although ground water is not as susceptible to droughts as surface water, public water suppliers that have an insufficient number of wells or capabilities to meet increase demand are vulnerable. While all suppliers may be potentially impacted, some are particularly vulnerable. Of the public water

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suppliers in the basin, seven (16%) were considered drought vulnerable in 2006.

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 technical, 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 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
- Kansas Department of Health and Environment: Kansas Public Water Supply Loan Fund

ISSUE: WATER QUALITY

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 (see [Watershed Restoration and Protection Basin Priority Issue](#)).

All the counties within the basin with the recent addition of Haskell County have a sanitarian funded by the Local Environmental Protection Program (LEPP). All counties in the basin, except Kearny and Ness, have countywide planning and zoning programs. All conservation districts in the basin have adopted nonpoint source pollution management plans. Buffer coordinators have also been employed in six counties in the basin to facilitate enrollment of stream buffers in the continuous conservation reserve program and State Water Quality Buffer Initiative. Dodge City, Garden City, and Great Bend are included in the Phase II National Pollutant Discharge Elimination System (NPDES) Stormwater Program as

having Municipal Separate Storm Sewers (MS4s).

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

- 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
- Kansas Department of Health and Environment: Watershed Management Program
- State Conservation Commission: Nonpoint Source Pollution Control Program
- State Conservation Commission: Water Resources Cost-Share Program

ISSUE: FLOOD MANAGEMENT

Kansas Water Plan flood management guidance emphasizes targeting watershed dam construction assistance to priority watersheds; encouraging participation in the National Flood Insurance Program; and preparing updated floodplain maps for priority communities. All counties in the basin, except Ness County, have county wide breach zoning plans.

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In 1993, the DWR launched the *Kansas Flood Mapping Initiative*. The FY 2005 *Kansas Water Plan* Flood Management Policy Section identified three priority counties to be mapped, remapped or to have existing information digitized in the Upper Arkansas basin. These counties are Barton, Hamilton, and Rice. Financial assistance from the *State Water Plan Fund* has been provided for this mapping. The Barton County map conversion into a digital format is near completion.

Applicable Kansas Water Plan Objectives

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

ISSUE: WATER-BASED RECREATION

While frequently dry within the basin, the Arkansas River is one of the three streams in the state that are considered navigable (as determined at time of statehood), and therefore is considered public land up to the channel's high water mark. Water-based recreation opportunities are limited in the basin. Fishing is popular at the few county fishing lakes. Jetmore Lake and Scott State Park Lake both provide fishing, boating and camping. Horsethief Reservoir began construction in 2008. When completed and filled, Horsethief will offer swimming, boating, fishing and camping. Horsethief Reservoir is a 450 acre lake located 18 miles north of Dodge City. Cheyenne Bottoms is a designated wetland of international importance, and provides excellent birding and hunting opportunities. In 2008, construction began on a Wetland Interpretive Center at Cheyenne Bottoms to ex-

pand public awareness of the Bottoms and the nearby Quivira wetland complex.

Applicable Kansas Water Plan Objectives

- Increase public recreational opportunities at Kansas lakes and streams.

Applicable Programs

The following program helps 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

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. Wetland and riparian management is addressed as a basin priority issue in the Upper Arkansas basin (see [Watershed Restoration and Protection Basin Priority Issue](#)).

Riparian lands in the Upper Arkansas basin have been seriously impacted by the infestation of non-native phreatophytes. Of greatest concern are the effects tamarisk (salt cedar) and Russian olive have on the basin's native riparian ecosystems.

Applicable Kansas Water Plan Objectives

- By 2010, maintain, enhance or restore priority wetlands and riparian areas.

Applicable Programs

- 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