

Smoky Hill-Saline River Basin Management Categories

WATER MANAGEMENT CATEGORIES

The following categories include issues identified in the [Smoky Hill-Saline 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 & 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](#)

Management of Kansas' ground and surface water fits into six statewide categories, with five of these applicable in the Smoky Hill-Saline basin. These are:

- 1) River-Reservoir management
- 2) Stream reaches with established Minimum Desirable Streamflow;
- 3) Streams outside of Minimum Desirable Streamflow protected areas;
- 4) The Ogallala-High Plains aquifer
- 5) Ground water outside of the Ogallala-High Plains aquifer

Ground water is the primary water supply in the basin. The Ogallala-High Plains [aquifer](#) is a major source in the extreme western portion of the basin. Alluvial ground water is utilized where available throughout the basin. Ground water recharge rates are generally low throughout the basin except in the extreme eastern portion of the basin. A majority of the basin is restricted or closed for new water appropriations. The Ogallala-High Plains aquifer is managed with the local leadership of the Western Kansas Groundwater Management District No. 1 (GMD1) and Northwest Kansas Groundwater Management District No. 4 (GMD4). GMD1 has identified the entire district as high priority. GMD4 has identified six high priority subunits. Goals and management for each

high priority subunit are under development. In 2008, a computer model developed for the six priority subunits in GMD4 was completed through cooperation of the Kansas Water Office (KWO), GMD4 and the U.S. Bureau of Reclamation. The model will aid in development and analysis of management scenarios.

In 2006, the KWO calculated the median annual water level changes in Ogallala–High Plains aquifer wells from 1981 to 2005. In the northwest Ogallala aquifer area, as of 2005, there has been no statistically significant change in the rate of decline. There was also no significant change in the water level decline rate for the west central Ogallala aquifer area.⁽⁶⁾ Additional information on this issue may be found in the [Smoky Hill-Saline basin priority issue](#) section.



Photo by Kansas Water Office.

Reduced streamflow and runoff into streams has been reflected in lower reservoir water levels in the three federal reservoirs in the basin: Cedar Bluff, Kanopolis Lake and Wilson Lake. Yield analyses that have revised the estimated yield availability, along with known loss of storage due to sedimentation, have driven the need to revisit reservoir management. This is discussed in the basin priority issue [Lower Smoky Hill River Water Management](#).

Requests for additional water from Kanopolis Lake exceed water available through the State Water Marketing Program. While mostly a public water supply issue, there is also a component of management of water in Kanopolis and the lower Smoky Hill River system to address before the public water supply issue can be resolved. Additional information on the public water supply issue may

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be found in the [Smoky Hill-Saline basin priority issue](#) section.

There are three minimum desirable streamflow (MDS) locations in the basin that are part of the Smoky Hill River system: 1) on the Smoky Hill River near Ellsworth; 2) on the Saline River near Russell; and 3) Chapman Creek near Chapman. There was statistically no change in the frequency MDS was met 1984 to 2004 when compared to historical frequency (1960 – 1983).

Applicable Kansas Water Plan Objectives

- Reduce water level decline rates within the Ogallala-High Plain 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 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 Geological Survey, Kansas Department of Agriculture, Division of Water Resources: Water Well Measurement
- State Conservation Commission: Water Right Transition Assistance Program
- USDA-Natural Resources Conservation Service: Environmental Quality Incentive Program (EQIP)
- Kansas Geological Survey: Stream Aquifer Interactions
- Kansas Geological Survey: High Plains Aquifer Technical Assistance Program
- Kansas Water Office: Water Marketing Program
- Kansas Water Office: Water Assurance Program
- Kansas Water Office: State Water Planning 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 a part of maintaining a long-term water supply for Kansas.

Water conservation activities apply to all uses, irrigation, municipal, industrial, and others, and from all sources. In 2006, irrigation accounted for 87% of all reported water pumped or diverted in the basin. Municipal use accounted for nine percent of water used in the basin, livestock water for one percent, and industry, recreation, and domestic uses for less than one percent each while other uses totaled two percent.

Of the 616 [public water suppliers](#) that have an approved conservation plan in place as of December 31, 2008, 65 plans have been approved in the Smoky Hill-Saline basin. As of August 2006, 139 conservation plans had been approved for irrigation water rights in the basin.

The number of wells in Kansas that were reported to have irrigation application rates over the regional average fluctuated from about 3,700 to less than 500 from 1991 to 2005. Of the total number of wells that were reported to have diverted water in 2006, more than 59% in the

2007 Kansas Municipal Water Conservation Plan



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Smoky Hill-Saline basin had a metered quantity, according to the Water Right Information System (WRIS) database.

Water conservation in the basin is exemplified by the efforts of the City of Hays. City policy has successfully kept consumption low while maintaining a viable and growing economy. Additional needs in the basin in the

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future for growth and economic expansion indicate using water efficiently will be more important than ever.

GMD1 operates the Western Kansas Weather Modification Program for 10 counties in western Kansas. The Program goals include hail suppression and precipitation enhancement. Protection of crops from hail reduces water waste if irrigated crops should be lost.

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 State University Research and Extension: Water Conservation and Management Program/MIL
- State Conservation Commission: Water Resources Cost-Share Program
- State Conservation Commission: Water Right Transition Assistance Program
- Kansas Water Office: Water Conservation 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.

In 2006 there were 79 public water supplies in the Smoky Hill-Saline basin. Ground water is the primary source for most public water supplies, accounting for nearly 73% of the total supply, principally from the Ogallala-High Plains, the Dakota and the alluvial aquifers along major streams. In addition, the City of Russell obtains a portion of their water from surface flow in the Smoky Hill River, below Cedar Bluff Reservoir. Kanopolis Lake supplies a large geographic area through rural water district connections.



Smoky Hill River Dam at Pfeiffer. Photo by Kansas Water Office

Among the state's major river basins, the percentage of drought vulnerable public water suppliers in 2006 ranged from three percent (Neosho Basin) to 42% (Solomon Basin). Comparison of the KWO 2000 and 2006 lists shows a significant increase in the number of drought vulnerable public water suppliers in most western river basins including the Smoky Hill-Saline. There were 30 public suppliers considered drought vulnerable in the Smoky Hill-Saline basin in 2006.

Public water supply needs in the basin have increased in recent years and are expected to continue due to population and industrial growth in the central and eastern parts of the basin. Kanopolis and Wilson Lakes and their operation plans are under review as components to meeting future demands. Meeting public water supply needs is a basin priority issue. Additional information on

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this issue may be found in [the Smoky Hill-Saline Basin priority issue](#) section.

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 Department of Health and Environment: Kansas Public Water Supply Loan Fund
- Kansas Water Office: State Water Planning Program
- Kansas Water Office: Water Conservation Program

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.

All the counties within the basin have a sanitizer funded by the Local Environmental Protection Program (LEPP).⁽²⁾ All conservation districts in the basin have adopted non-point source pollution management plans. Buffer coordinators have also been employed in four counties in the basin to facilitate enrollment of stream buffers in the continuous Conservation Reserve Program (CRP) and State Water Quality Buffer Initiative.⁽⁴⁾

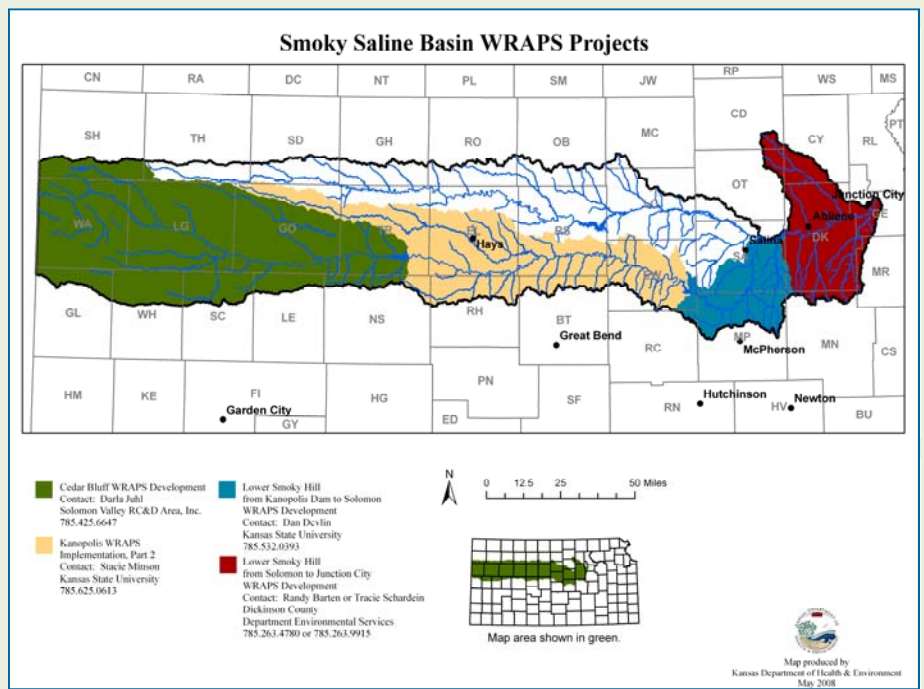
The Clean Water Act requires states to conduct Total Maximum Daily Load (TMDL) stud-

ies and develop TMDLs for water bodies identified on the state's List of Impaired Waters (Section 303(d) List). TMDLs are quantitative objectives and strategies needed to achieve the state's surface water quality standards. There are 33 approved TMDLs within the Smoky Hill-Saline basin. Five are high priority for implementation. There are 2 lakes, Lake Scott and Herrington Reservoir listed as water quality impaired by eutrophic conditions, pH, dissolved oxygen, and/or aquatic plants. Streams are sampled at 26 locations with dissolved oxygen depletion, total dissolved solids, selenium and total phosphorus identified as the cause of the greatest number of impairments. Other pollutants limiting use of Smoky Hill-Saline basin streams include arsenic, cadmium, lead, nitrates, dissolved oxygen, E. Coli bacteria, and biological stressors. Additional TMDL development is anticipated in 2009.

Kansas Watershed Restoration and Protection Strategy (WRAPS) is a planning and management framework that engages stakeholders within a watershed in a process to:

- Identify watershed restoration and protection needs.
- Establish watershed management goals.
- Create a cost-effective action plan to achieve goals.
- Implement the action plan.

As of March 2008, there were 44 active WRAPS projects located throughout Kansas⁽³⁾. Four are in the Smoky Hill-Saline basin, including all the [watersheds](#) for the Smoky Hill River.



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Major point sources in the basin include waste water treatment plants. The City of Hays is included in 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 Department of Health and Environment: Local Environmental Protection Program
- Kansas Department of Health and Environment: Watershed Management Section/WRAPS
- State Conservation Commission: Nonpoint Source Pollution Control Program
- State Conservation Commission: Water Resources Cost-Share Program
- Kansas Corporation Commission: Conservation Division Programs
- Kansas Department of Health and Environment: Watershed Management Section/TMDL

ISSUE: WETLAND & RIPARIAN MANAGEMENT

The primary approach to wetland and riparian management in the basin focuses on providing technical and fi-

ancial assistance to landowners to protect and restore these resources in priority watersheds through the implementation of best management practices.



Photo by Kansas Water Office.

Riparian lands in the Smoky Hill-Saline basin have been impacted by the infestation of non-native phreatophytes, although not to the degree as in other western basins. Of greatest concern are the effects tamarisk (salt cedar) and Russian olive have on native riparian ecosystems.

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

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ISSUE: FLOOD MANAGEMENT

Flooding is a natural, recurring event associated with streams and rivers that has resulted in the formation of natural floodplains over time. While this inundation provided benefits under natural conditions, encroachment of urban and agricultural development onto floodplains has resulted in the potential for flood damage. In addition, the Smoky Hill-Saline basin is prone to flash flooding which is characterized by a rapid rise in water level, fast-moving water and much flood debris.

Kansas Water Plan flood management guidance has targeted watershed dam construction assistance to priority watersheds, encouraged National Flood insurance participation and updating of floodplain maps for priority communities.

Significant flooding was experienced during 1903, 1938 and 1941 on the Smoky Hill River. Three federal dam projects: Cedar Bluff, Kanopolis and Wilson, contribute to flood control in the basin. Local watershed districts construct, operate and maintain works of improvement needed to provide for water management within designated boundaries. Their primary function is to develop a comprehensive general plan for a watershed that will provide flood protection for the residents and landowners. Three watershed projects are located in the basin, two of which are now completed.

Financial assistance from the State Water Plan Fund has been provided for flood mapping as part of the 1993 Kansas Department of Agriculture-Division of Water Resources *Kansas Flood Mapping Initiative* in Ellis and Saline counties in the basin. Ellsworth and McPherson counties are included in this initiative to have maps modernized by 2110.

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
- State Conservation Commission: Watershed Dam Construction Program
- State Conservation Commission: Watershed Planning Assistance Program
- FEMA: National Flood Insurance Program

ISSUE: WATER-BASED RECREATION

The Smoky Hill-Saline basin has a wide variety of public water recreation sites on state and federal land. There is a demand for more consistent water levels, and access to water based recreation facilities for area residents. Recreation contributes income to the economy by attracting sportsmen and women to the area for hunting at wildlife areas, camping and picnicking at recreation areas, and fishing and boating on reservoirs and lakes.

Cedar Bluff Reservoir and Kanopolis and Wilson lakes provide recreational opportunities including fishing, boating, and camping. Wildlife areas include Cedar Bluff Wildlife Area, Wilson Wildlife Area and the Smoky Hill Wildlife Area at Kanopolis Reservoir. In addition, the state supports fishing at Kanopolis State Park Pond, Logan State Fishing Lake and Saline State Fishing Lake (Periodically Dry).

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 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: State Parks

ISSUES FOR FUTURE ACTION

None identified at this time.