

Upper Republican River Basin Management Categories

WATER MANAGEMENT CATEGORIES

The following categories include issues identified in the Upper Republican basin plan as items that require attention in addition to the basin priority issues. These issues are addressed in 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

Management of Kansas' ground and [surface water](#) fits into six statewide categories, with five of these applicable in the Upper Republican basin. These are:

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

Ground water is the primary water supply in the basin, supplying 98 percent (%) of [water used](#) in 2006. The Ogallala-High Plains aquifer is a major source in the basin. Where it interconnects with alluvial ground water, it may have an affect on streamflow. Ground water recharge rates are generally low throughout the basin. A majority of the basin is restricted or closed for new water appropriations. Water resources in the basin are managed with the local leadership of the Ogallala-High Plains aquifer area by Northwest Kansas Groundwater Management District No. 4 (GMD4). GMD4 has identified six high priority aquifer subunits. Goals and management for each are under development.

In 2008 a computer model developed for the six priority subunits was completed through cooperation of the Kan-

sas Water Office (KWO), GMD4 and the U.S. Bureau of Reclamation (Bureau). The model will aid in development and analysis of management scenarios.

In 2006, the KWO calculated the median annual water level changes from 1981 to 2005. In the northwest Ogallala aquifer area, as of 2005, there has been no statistically significant change (at a 5% error level) in the rate of decline. Reducing the decline rate of the Ogallala-High Plains aquifer is a basin priority issue.

Reduced streamflow and runoff into streams has been reflected in water levels in Keith Sebelius Lake, the federal project in the basin. These conditions and reduced availability of irrigation water stored in the reservoirs have suggested a need to take a fresh look at reservoir management.

Kansas entered into agreement with Colorado and Nebraska in 1943 to divide Republican River and tributary flows. Kansas has met its obligations leaving the state but has been shorted on water entering the Upper Republican basin.



South Fork Republican River, Cheyenne County.
Photo courtesy Kansas Geological Survey

Compliance with the Republican River Compact Settlement and Agreement and management of the Upper Republican River water resources in Kansas is a basin priority issue. Additional information on this issue may be found in the [Upper Republican Basin Priority Issue](#) section.

Applicable *Kansas Water Plan* Objectives

- Reduce water level decline rates within the Ogallala-High Plain aquifer and implement enhanced water

Upper Republican River Basin Management Categories

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 (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, Kansas Department of Agriculture-Division of Water Resources: Water Well Measurement
- Kansas Geological Survey: High Plains Aquifer Technical Assistance Program
- State Conservation Commission: Water Right Transition Assistance Program
- USDA-Natural Resources Conservation Service: Environmental Quality Incentive Program (EQIP)
- 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



Irrigation. Photo courtesy Kansas Geological Survey.

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 nearly 98% of all [reported water](#) pumped or diverted in the basin. Municipal use accounted for two percent of water used in the basin, stock, industry, recreation, domestic and other uses for less than one percent each.

Of the 616 [public water suppliers](#) that have an approved conservation plan in place as of December 31, 2008, 11 plans have been approved in the Upper Republican basin. As of August 2006, 210 conservation plans had been approved for irrigation water rights in the basin. The number of diversion points in Kansas that reported 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 individual points of diversions that were reporting use of a measurable quantity of water in Kansas in 2006, more than 44% reported a metered quantity at least once during that year in the Upper Republican basin. (Source: DWR: Water Right Information System).

Applicable Kansas Water Plan Objectives

- Reduce the number of public water suppliers with excessive unaccounted for water by first targeting those with 30% 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 category. For more information

Upper Republican River Basin Management Categories

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
- State Conservation Commission: Water Right Transition Assistance Program
- Kansas Water Office: Water Conservation 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 16 [public water suppliers](#) in the Upper Republican basin. Ground water is the primary source for most public water supplies, accounting for over 95% of the total supply, principally from the Ogallala and Dakota [aquifers](#) and alluvial deposits along major streams. The City of Norton obtains a portion of their water from storage in Keith Sebelius Reservoir.

Among the 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 by river basin shows a significant increase in the number of drought vulnerable public water suppliers in most western river basins, but the Upper Republican remained the same at three. One of these communities considered drought vulnerable in 2000 is still considered to be at risk due to basic source limitations in 2006. The other two listed in 2006 were not on the 2000 list.

Applicable Kansas Water Plan Objectives

- Ensure that sufficient surface water storage is avail-

able 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 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: Water Conservation Program
- Kansas Water Office: State Water Planning 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 programs.

All the counties within the basin have a sanitarian funded by the Local Environmental Protection Program (LEPP). All conservation districts in the basin have adopted non-point source pollution management plans. A buffer coordinator has also been employed in Thomas County to



South Fork of Republican River. Photo courtesy KGS.

Upper Republican River Basin Management Categories

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facilitate enrollment of stream buffers in the continuous Conservation Reserve Program (CRP) and State Water Quality Buffer Initiative.

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). TMDLs are quantitative objectives and strategies needed to achieve the state's surface water quality standards. There are 11 approved TMDLs within the Upper Republican basin; dissolved oxygen on lower Prairie Dog Creek is a high priority for implementation. Colby City pond and Norton Lake are listed as water quality impaired by eutrophic conditions, dissolved oxygen, and/or pH. Other pollutants limiting use of Upper Republican basin streams include fluoride, selenium, pH and sulfate. TMDL development for additional parameters 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.

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

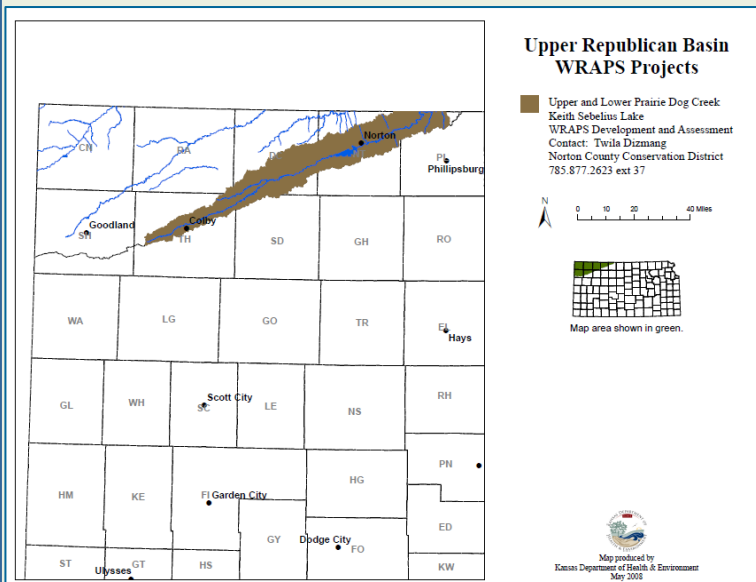
The following programs help to meet the objectives in the Water Quality category. For more information on the programs and associated policies, see the [Programs Manual](#).

- 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: 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.

Riparian lands in the Upper Republican basin have been impacted by the invasion and infestation of non-native phreatophytes, although not to the degree as in other western basins. Of greatest concern are the effects



As of March 2008, there were 44 active WRAPS projects located throughout Kansas. One is on Prairie Dog Creek, in the Upper Republican basin, including the watersheds above and below Keith Sebelius Lake.

Upper Republican River Basin Management Categories

tamarisk (salt cedar) and Russian olive 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

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 Upper Republican basin is particularly prone to flash flooding which is characterized by a rapid rise in water level, fast-moving water and much flood debris.

Significant flooding was experienced during 1903, 1915, 1935 and 1941 on the Upper Republican River. One federal project, Norton Dam and associated Keith Sebelius Lake contributes to flood control in the basin. There are no watershed dam projects in the basin.

Kansas Water Plan flood management guidance has emphasized targeting watershed dam construction assistance to priority watersheds; encouraging participation in the National Flood Insurance Program; and preparing updated floodplain maps for priority communities.

Financial assistance from the State Water Plan Fund has been provided flood mapping as part of the 1993 Kansas Department of Agriculture-Division of Water Resources *Kansas Flood Mapping Initiative*. None has oc-



Keith Sebelius Reservoir. Photo courtesy Diane Coe, KWO.

curred in the Upper Republican basin.

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

ISSUE: WATER-BASED RECREATION

The Upper Republican basin has 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 that provide recreational income to the economy by attracting sportsmen and women to the area.

The Keith Sebelius Lake and associated recreation areas including Prairie Dog State Park, draw hunters, fish-

Upper Republican River Basin Management Categories

ermen and boaters to the area. In addition, state-operated lakes offer fishing in the basin including; Sherman State Fishing Lake when sufficient water is present, and St. Francis sand pits.

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: State Parks

ISSUES FOR FUTURE ACTION

None identified.



Prairie Dog State Park at Keith Sebelius Reservoir.
Photo courtesy Kansas Geological Survey