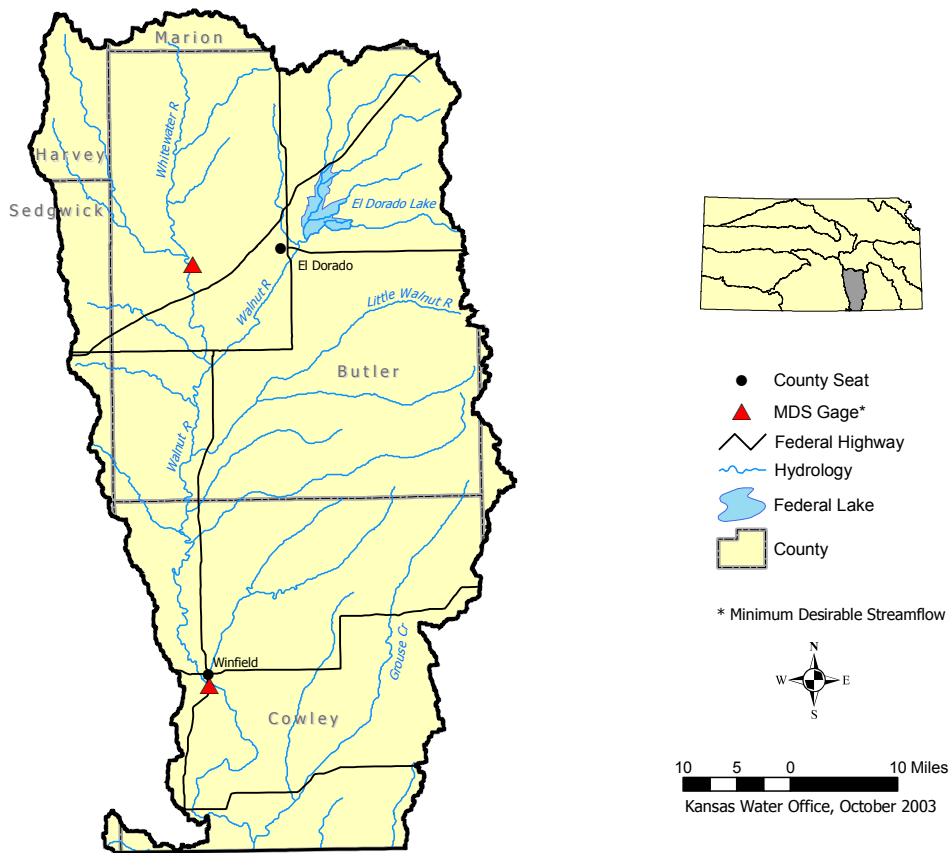


KANSAS WATER PLAN WALNUT BASIN SECTION

SUPPLEMENTAL ASSESSMENT AND DESCRIPTION OF CURRENT ACTIVITIES



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INTRODUCTION

The purpose of this document is to report the current activities and summarize assessment results for the priority and water management category issues in the Walnut Basin. This document will be updated periodically as new activities and studies are initiated.

BASIN PRIORITY ISSUES

Priority Issue: Regional Public Water Supply

Public water supply issues in the Walnut basin focus 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.

KANSAS WATER PLAN OBJECTIVES:

- By 2010, 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.
- By 2010, less than 5 percent of public water suppliers will be drought vulnerable.
- By 2010, ensure that all public water suppliers have the technical, financial and managerial (TFM) capability to meet their needs and to meet Safe Drinking Water Act requirements.

BASIN SPECIFIC OBJECTIVE:

- Develop a regional public water supply strategy for the Walnut basin.

Summary of Current Activities

In 2002, under the direction of the Natural Resources Subcabinet, a Water Issue Strategic Team (WIST), comprised of representatives from the state's natural resource agencies, was formed to identify the high-priority current issues they held in common.

In 2003, the WIST identified the protecting and enhancing instream flows as an issue in need of further coordination and study. As a result, an inter-agency working group was formed to specifically address this issue. The working group has developed a Water Issue Strategic Plan (WISP) that defines the issue, goals, objectives, strategies, and activities related to the issue.

The goals identified in the WISP include:

- Develop restoration and protection plans for existing and planned public water supplies (ground water and surface water).
- Provide state and federal programs support for implementation of local watershed restoration and protection plans.
- Ensure adequate local support for plan implementation.
- Develop plans to restore TMDL watersheds.
- Stabilize hydraulic/hydrologic function of watersheds (use comprehensive approach).
- Obtain public recognition of the importance of watershed protection (social marketing).

Several strategies and activities have been proposed to accomplish these goals. As the WISP is further developed and activities are initiated, additional information will be available in this supplemental assessment.

Research and Assessment

A Walnut Basin Area Regional Water Supply Strategic Analysis was completed by the KWO in 1998. The analysis was initiated in response to inquiries from the cities of Andover, Derby, Augusta, Winfield, Mulvane and Rose Hill regarding the potential of constructing Douglass Reservoir for use as a future water supply source. Because the Corps of Engineers determined that the Douglass Project did not meet the flood control benefit criteria necessary for construction through its programs, the six cities requested assistance from the KWO to explore the options available through state programs for the development of future water supplies. Upon completion of the five county strategic analyses, the KWO found that the development of additional water supply storage was not warranted at that time. Several recommendations to address water needs in the area were made, including that the focus of a newly formed Regional Water Utility Coordinating Committee should be on the infrastructure needs of the public water suppliers in the region, in order to take advantage of existing water supply inventories. The analysis concluded that El Dorado Lake should be strongly considered as the primary water source for much of the region.

During 2004, the KWO will be updating this study with more recent regional population and demand projections. The analysis will project further into the future for supply and demand evaluations. This will be accomplished as part of development of an Issue Paper for consideration to be included in the Walnut Basin Section of the Kansas Water Plan concerning a proposed reservoir on Grouse Creek in Cowley County. The information is expected to be available by September 2004.

Priority Issue: Watershed Restoration and Protection

The protection and restoration of watersheds with impaired water quality and watersheds above public water supply sources are high priorities in the Walnut Basin. Three main components of this issue include achievement of Total Maximum Daily Loads (TMDLs), development of Source Water Protection Plans, and restoration and protection of wetland and riparian areas.

KANSAS WATER PLAN OBJECTIVES:

- By 2010, reduce the average concentration of bacteria, biochemical oxygen demand, dissolved solids, metals, nutrients, pesticides and sediment that adversely affect the water quality of Kansas lakes and streams.
- By 2010, reduce the average concentration of dissolved solids, metals, nitrates, pesticides and volatile organic chemicals that adversely affect the water quality of Kansas ground water.
- By 2010, ensure that water quality conditions are maintained at a level equal to or better than year 2000 conditions.
- By 2010, maintain, enhance or restore priority wetlands and riparian areas.

BASIN SPECIFIC OBJECTIVES:

- Demonstrate significant progress towards achieving TMDL goals by 2012, in accordance with the ten year implementation time frame.
- Have source water protection plans developed by public water suppliers in the basin.

Summary of Current Activities

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- Obtain public recognition of the importance of watershed protection (social marketing).

Several strategies and activities have been proposed to accomplish these goals. As the WISP is further developed and activities are initiated, additional information will be available in this supplemental assessment.

The Kansas Water Office (KWO) and the Corps of Engineers (COE) have been cooperating since 2000 to evaluate the potential for ecosystem restoration in the Walnut River Basin. A Section 905(b) Analysis, termed a reconnaissance study, was started in February 2000 by the COE and a completed report submitted to the KWO in July 2000. This report, prepared entirely with federal funding, recommends that a detailed feasibility study be conducted by the COE, and the report submitted to Congress to request federal funding to implement best management practices (BMPs) in targeted areas throughout the watershed. Installation of BMPs would require voluntary landowner participation facilitated by local governments and agencies. Federal funding would be provided at the rate of two federal dollars for each state or local dollar.

A draft report of the first phase of the feasibility study was completed by the COE in February 2003 and submitted to the KWO for review. During the review process, which involved other federal, state and local agencies, it was determined that implementation could best be accomplished by local entities using existing federal and state cost share programs. The draft report contained extensive modeling information that was sufficient to target existing resources and it was concluded that implementation had better chances of occurring if the federal government was not as closely associated with the project. As a result, the final phase of the feasibility study was put on hold while the KWO discussed internally the best way to proceed. There was also the question of the ability of the state to provide the remaining required match due to recently developing state budget concerns.

During this time, the City of El Dorado (CED) expressed interest in developing a detailed watershed restoration and protection strategy for the area above El Dorado Lake. Concurrently, watershed restoration and protection, and reservoir restoration and protection, were identified by the KWO as high priority issues to be addressed through the new planning process. Through further discussions between the COE, KWO and CED, it was determined that the project could be re-scoped to focus on the El Dorado Lake watershed, with increased emphasis on evaluating the potential for reservoir restoration opportunities. This could be accomplished within the scope of the existing contract. KWO would remain the contractor with a Memorandum of Understanding developed with the City of El Dorado outlining the city's responsibilities and match commitment.

Discussions have been underway between the three entities since August 2003 to develop a new work plan for the feasibility study; goals and objectives are summarized below. A Memorandum of Understanding is close to being finalized between the KWO and the CED.

Goal 1. Identify effective reservoir restoration and protection measures to ensure long term availability of storage space for public water supplies in federal reservoirs, using El Dorado Lake as a pilot.

- Objective 1. Conduct a bathymetric survey using new available technology. Correlate findings with previous surveys to determine the amount and location of sediment accumulation. Using remote sensing photography and other tools, determine distribution and relative rates of sediment accumulation in the arms of the reservoir vs. the main basin. Evaluate if the rate of 297 acre-feet/year is higher or lower than the design rate expectation. Project longevity of the reservoir using current information.
- Objective 2. Conduct sampling of suspended sediment in reservoir inflows under low, medium, and high flow regimes. Use existing data as available.
- Objective 3. Based on results of Objectives 1 and 2, determine reasonable levels of reduction for suspended sediments entering the lake from the watershed and from in lake erosion.
- Objective 4. Assess the water quantity, quality and aquatic life impacts of sedimentation in ElDorado Lake.
- Objective 5. Identify options for managing sediment accumulation in and around El Dorado Lake on Federal and State property. Options may include in-lake dredging, wetland installation and maintenance, mowing plans, riparian restoration and planting, construction of sediment basins, watershed management, and stream and lake bank restoration.
- Objective 6. Evaluate the economic, social, and environmental effects of implementing the identified alternatives. Include infrastructure development and sediment disposal scenarios. Prepare a Master Management plan of the reservoir to reduce incoming sediment and to address future restoration needs resulting from sedimentation.

Goal 2. Identify watershed restoration and protection needs and determine opportunities to implement effective management practices. Primary Nonfederal Sponsor: City of El Dorado.

- Objective 1. Complete an assessment of the El Dorado Lake Watershed to identify where "Best Management Practices" are most needed and at what scale those practices will have the greatest benefit to address watershed restoration and protection needs, while giving equal consideration to social impacts and environmental sustainability.
- Objective 2. Access and identify geographic areas (HUCs) contributing potentially high pollutant concentrations.
- Objective 3. Disseminate findings of the feasibility study to local conservation agencies, landowner groups and the general public for the purpose of determining public interest and acceptance and to aid in determining State and Federal priorities for implementation.
- Objective 4. Submit feasibility study, recommendations, and funding request to state legislature and Congress for implementation authorization.

Research and Assessment

No additional analysis or assessments related to this priority issue are available at this time.

WATER MANAGEMENT CATEGORIES

Issue: Water Management

KANSAS WATER PLAN OBJECTIVES:

- By 2015, 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 stream flows.
- By 2015, meet minimum desirable stream flow at a frequency no less than the historical achievement for the individual sites at time of enactment.

Summary of Current Activities

There are no current activities related to this issue to report at this time.

Research and Assessment

No additional research or analysis related to this issue is available at this time.

Issue: Water Conservation

KANSAS WATER PLAN OBJECTIVES:

- By 2010, reduce the number of public water suppliers with excessive unaccounted for water by first targeting those with 30 percent or more unaccounted for water.
- By 2015, all non-domestic points of diversion meeting predetermined criteria will be metered, gaged or otherwise measured under the authority of K.S.A. 82a-706c and K.S.A. 82a-1028(I). Criteria will include a minimal use requirement and priority area targeting.
- By 2015, conservation plans will be required for water rights meeting the priority criteria under K.S.A. 82a-733 and it has been determined that such a plan would result in significant water management improvements.

Summary of Current Activities

There are no current activities related to this issue to report at this time.

Research and Assessment

Irrigation

On September 22, 2000, the Kansas Department of Agriculture, Division of Water Resources adopted new county-based acre-foot per acre standards on reasonable quantities of water for irrigation use. The new county-based standards were established either on the net irrigation requirement for corn for an 80 percent chance rainfall event or a value equivalent to one standard deviation from the mean reported water use for a county, whichever is higher. These values are considered the maximum amount that can be authorized for a new irrigation water right permit. As such, it is expected that the annual water use would typically be less than these values and only approach these maximum levels during dry climatic periods.



In accordance to the FY 2003 Kansas Water Plan, the newly adopted county-based standards were used as the benchmark for amounts considered reasonable for irrigation. It should be noted that water use in excess of the new county-based acre-foot per acre standards does not necessarily imply that an irrigator has exceeded the authorized quantity for water right or violated the Kansas Water Appropriation Act.

There are many reasons for high irrigation water use ranging from climatic factors to irrigated crop and soil types. The assessment attempts to measure potentially inefficient irrigation water usage and possibly target enhanced water conservation measures where appropriate.

This assessment used annual irrigation water use report data collected by the Kansas Department of Agriculture, Division of Water Resources.

There were three data parameters used in the irrigation assessment: 1) the total number of irrigation points of diversion that reported higher acre-foot per acre than the county-based acre-foot per acre standards, 2) the total amount of irrigation water reported used over the county-based acre-foot per acre standards, and 3) the number of irrigation water rights (which were grouped together based on how they overlap one another by either points of diversion or place of use) that appear to use water in excess of their respective authorized quantities.

A detailed description of the methodology and assessment can be viewed at the Kansas Water Office website: <http://kwo.org>.

Table 1. Number of Irrigation Points of Diversion Reporting Water Usage Over KDA-DWR County-Based AF/A Standards 1991-1997									
1991	1992	1993	1994	1995	1996	1997	1998	1999	Average
13	4	6	2	1	3	2	4	3	4

Table 2. Amount of Irrigation Water, in Acre-Feet, Reported Used Over the KDA-DWR County-Based AF/A Standards 1991-1997									
1991	1992	1993	1994	1995	1996	1997	1998	1999	Average
272	69	83	106	8	142	33	384	91	132

Table 3. Total Number of Water Right Groups that Appear to Have Used Water in Excess of Their Annual Authorized Quantity 1991-1997									
1991	1992	1993	1994	1995	1996	1997	1998	1999	Average
7	2	0	4	0	3	0	5	3	3

Figure 1. Number of Irrigation Points of Diversion Reporting Water Usage Over KDA-DWR County Based AF/A Standards, 1991-1997.

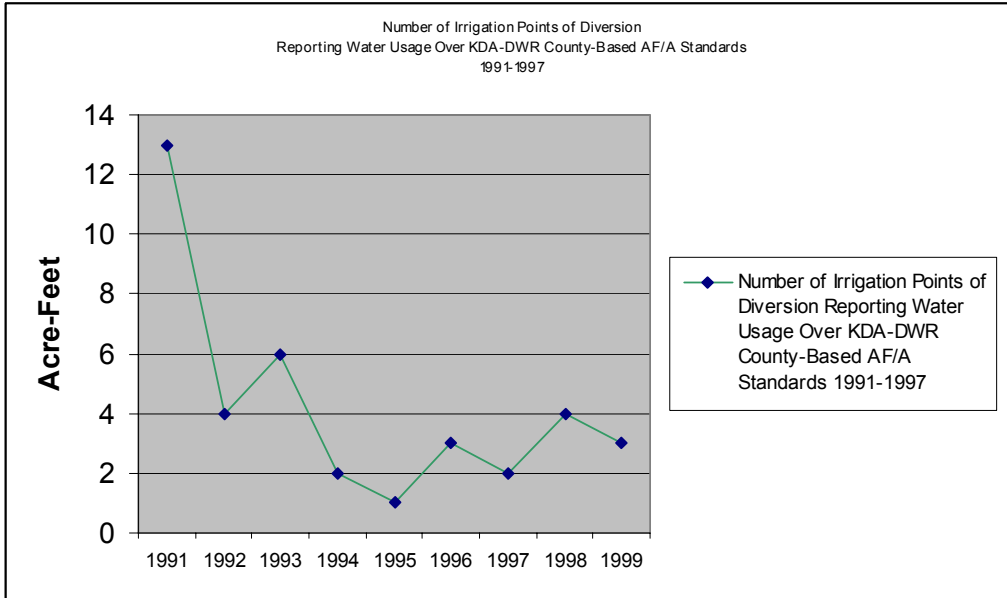


Figure 2. Amount of Irrigation Points of Diversion Reporting Water Usage Over KDA-DWR County Based AF/A Standards, 1991-1997.

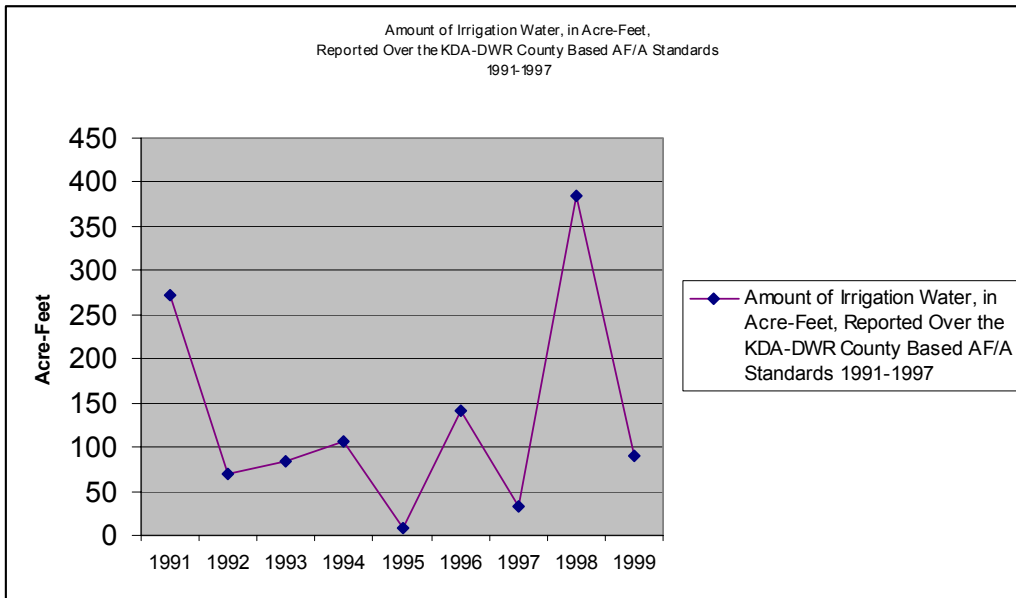
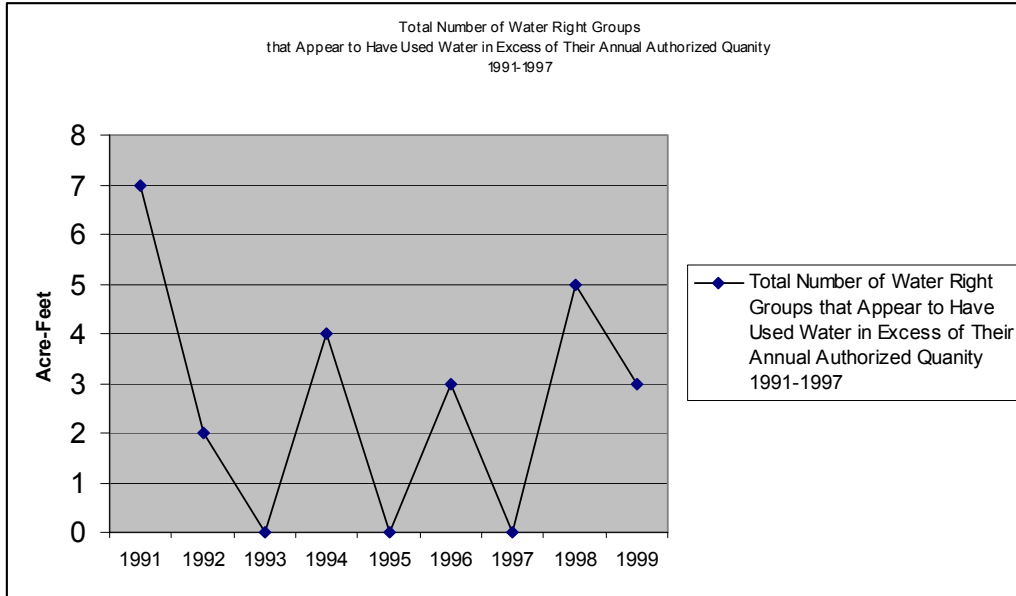


Figure 3. Total Number of Water Rights that Appear to Have Used Water in Excess of Their Actual Authorized Quantity, 1991-1997.



Municipal

Unaccounted for water is the amount of water that a public water supplier diverted under its water right or appropriation and/or purchased from other entities; minus the metered amounts that are sold to other public water suppliers; sold to large industrial, bulk, or livestock water users; sold to residential and commercial customers; or distributed as free water. A public water supplier may have a high percent of unaccounted for water, if it has: 1) inaccurately estimated the amount of water pumped or purchased due to not metering all water at the intake source or by using raw water or finished water meters that are inaccurate or improperly installed; 2) inaccurate customer meters; 3) bookkeeping errors; 4) non-metered uses such as water used in the treatment process, city buildings, churches, watering a golf course, etc.; or 5) water leaks.

The Kansas Water Office determined the percent and amount of unaccounted for water suppliers by using two data sets: 1) the annual municipal water use report data collected by the Kansas Department of Agriculture, Division of Water Resources; and 2) the Kansas Water Office Population and Demand Projections data. The time period used for this assessment was 1992-1997.

One data parameter used for this assessment was the number of public water suppliers with 30 percent or more unaccounted for water. The amount of unaccounted for water in excess of 15 percent of the total water pumped or purchased by public water suppliers was chosen as a second data parameter, in order to gain a better understanding of the amount of unaccounted for water that might be saved for beneficial use. A public water supplier cannot account for all water pumped. Since 15 percent was the average percent of unaccounted for water for Kansas public water suppliers in 1997, it is considered the reasonable standard for unaccounted for water.

The number of public water suppliers that reported 30 percent or more unaccounted for water in the Walnut Basin declined from 1992 to 1997. The average amount of

unaccounted for water in excess of 15 percent of total water use in the basin was 28,734,000 gallons.

Table 4. Number of Public Water Suppliers With 30 Percent or More Unaccounted for Water 1992-1997					
1992	1993	1994	1995	1996	1997
3	1	1	1	2	1

Table 5. Unaccounted for Water in Excess of 15 Percent of Total Water Use in Thousands of Gallons 1992-1997					
1992	1993	1994	1995	1996	1997
30,893	13,600	17,532	29,987	37,268	43,131

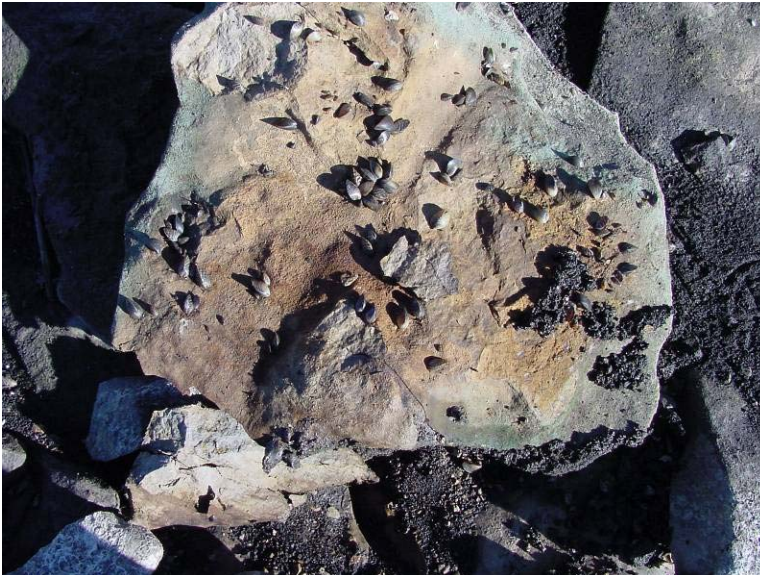
Issue: Water Quality

KANSAS WATER PLAN OBJECTIVES:

- By 2010, reduce the average concentration of bacteria, biochemical oxygen demand (BOD), dissolved solids, metals, nutrients, pesticides and sediment that adversely affect the water quality of Kansas lakes and streams.
- By 2010, reduce the average concentration of chloride, metals, nitrate, pesticides, sulfate and volatile organic chemicals that adversely affect the water quality of Kansas ground water.
- By 2010, ensure that water quality conditions are maintained at a level equal to or better than year 2000 conditions.

Summary of Current Activities

Non-native Zebra mussels have been found in El Dorado Lake, the first documented occurrence in Kansas waters. Sampling done by the Kansas Department of Wildlife and Parks indicates that they have been in the lake for about three years. Zebra mussels attach to structures in the water and may clog water supply intakes. Zebra mussels are capable of filtering smaller materials than native mussels; the larvae of native mussels float and Zebra mussel larvae fall to the bottom after a couple of weeks. They are very prolific, reach maturity quickly and each female is capable of producing 1 million eggs/year. They reproduce best in water temperatures above 52 degrees. Known predators are the freshwater drum, sunfish, catfish, and diving and puddle ducks.



Zebra mussels are susceptible to high water temperatures, especially above 90 degrees. El Dorado Lake is probably near their southern most range. In addition to be transmitted by infected boats, they can be transmitted by ducks and geese, so boat hygiene alone is probably not enough to control their spread.

The city of El Dorado is working with a consultant to develop preventative measures to control the attachment of the mussels to water intakes. In addition, a task force has been formed consisting of several natural resource agencies and interests. The task force is meeting on a regular basis to coordinate strategies for addressing the infestation in El Dorado reservoir in particular, and to prevent the spread of the mussels

to other reservoirs in the state. For more information, contact Tom Mosher, Kansas Department of Wildlife and Parks, tomm@wp.state.ks.us. In addition, a national effort, The 100th Meridian Initiative, has been formed to prevent the westward spread of zebra mussels. Very good information is available on their website, www.100thmeridian.org.

Research and Assessment

No additional analysis or assessments related to this priority issue are available at this time.

Issue: Flood Management

KANSAS WATER PLAN OBJECTIVE:

- By 2010, reduce the vulnerability to damage from floods within identified priority communities or areas.

Summary of Current Activities

There are no current activities related to this issue to report at this time.

Research and Assessment

No additional analysis or assessments related to this priority issue are available at this time.