

MEMO



DATE: September 22, 2011
TO: Upper Arkansas BAC and Agency Advisors
FROM: Diane Coe, Kansas Water Office
RE: October 6, 2011 meeting

901 S. Kansas Avenue
Topeka, KS 66612
Phone: (785) 296-3185
Fax: (785) 296-0878
www.kwo.org

The next meeting for the Upper Arkansas Basin Advisory Committee (BAC) is scheduled for **1 p.m., Thursday, October 6, 2011 at the King Center, 308 Main St, Jetmore, Kansas.**

The meeting will cover the actions and activities from the Kansas Water Authority (KWA) meeting, including approval of BAC nominations and welcoming our new members. The committee will need to make a recommendation on leadership of the committee, which can include re-nominating the existing chair. Another KWA action, the adoption of the Aquatic Nuisance Species Policy section should be discussed in regard to the basin priority issue *Salt Cedar and Other Non-Native Phreatophyte Control*. I have attached the policy and basin issue so you may review them prior to the meeting.

We plan to have a presentation on Limited Irrigation Crop Insurance by the USDA Risk Management Agency (RMA). Other topics include the State Water Plan budget for FY13 and an update on the Governor's Summit on the Ogallala, and it's follow up by the Ogallala Aquifer Advisory Committee.

If you cannot attend, or have any questions or concerns regarding the meeting please contact me at diane.coe@kwo.ks.gov; or toll-free at (888) KAN-WATE(R).

Enclosures: Agenda
Press Release
June BAC Meeting Notes
KWA response(s) to Bac messages
Memo on State Water Plan Budget
Aquatic Nuisance Species Policy
Salt Cedar BPI

Upper Arkansas Basin Advisory Committee
1:00 pm, Thursday, October 6, 2011
King Center
308 Main St. Jetmore, KS

- 1. Welcome and Introductions**
- 2. BAC Approval of Agenda**
- 3. Agency Reports ***
- 4. Public Comments****
- 5. BAC Business**
 - a. Approval of June 2011 Meeting Notes
 - b. Kansas Water Authority Update
 - i. Chair report
 - ii. Aquatic Nuisances Species Policy
 - iii. June Message to KWA
 - c. Budget
 - d. Membership - chairmanship
 - e. BAC member reports
- 6. Limited Irrigation Crop Insurance – Risk Management Agency**
- 7. Basin Activities/Updates - Diane Coe**
 - a. Basin Priority Issues
 - i. Ogallala
 - ii. Salt Cedar/Phreatophytes
 - b. Other
- 8. Other Business**
 - a. Messages to the Kansas Water Authority
 - b. Kansas Water Authority meeting: November 3-4, Lawrence
 - c. Future BAC Meeting- March 2012
- 9. Adjourn**

Note underlined items are action items for BAC.

*Oral Agency Reports are limited to 5 minutes, written reports are welcome.

**Public Comments are limited to 2 minutes per speaker on water resource issues and concerns. Other comments should be addressed to the Director of KWO.

901 S. Kansas Avenue
Topeka, KS 66612



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Tracy Streeeter, Director

Sam Brownback, Governor

FOR IMMEDIATE RELEASE:
September 22, 2011

Contact: Katie Patterson-Ingels, 785-296-0877
katie.ingels@kwo.ks.gov
www.kwo.org

Upper Arkansas Basin Advisory Committee to Hold Meeting in Jetmore

The Kansas Water Office's (KWO) Upper Arkansas Basin Advisory Committee (BAC) will hold a meeting to discuss current water issues affecting the basin area as well as the state.

The meeting will be held at 1 p.m., Thursday, October 6 at King Center, 308 Main in Jetmore. An overview for the FY 2013 State Water Plan budget as well input on its development will be discussed.

The agenda and meeting materials are available at: www.kwo.org or you may request copies by calling (785) 296-3185 or toll-free at (888) KAN-WATER (526-9283).

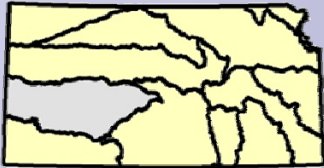
If accommodations are needed for a person with disabilities, please notify the Kansas Water Office at 901 S. Kansas Ave., Topeka, KS 66612-1249 or call (785) 296-3185 at least two days prior to the meeting.

Note to Editor: The Americans with Disabilities Act, (42 U.S.C. 12101), requires the Kansas Water Office to print the reasonable accommodations messages.

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As the state's water office, KWO conducts water planning, policy coordination and water marketing as well as facilitates public input throughout the state.

The agency prepares the KANSAS WATER PLAN, a plan for water resources development, management and conservation. KWO also reviews all water laws and makes recommendations to the Governor and Legislature for needed legislation.



Upper Arkansas Basin Advisory Committee

Meeting Notes

Upper Arkansas Basin Advisory Committee
1:00 p.m., Thursday, June 9, 2011
Finnup Center, Garden City, KS

DRAFT

Members in Attendance: Clark Rusco (Chair), Jamie Cheatum, Steve Cottrell, Randy Hayzlett, Steven Hines, Mick MacNair, Roger Mohr and Paul Tschopp

Members Absent: Beverly Komarek

Others in Attendance: Hal Scheuerman, Hugh Brownlee, Fred Jones (City of Lakin), Colin Thompson (Amity Ditch), Terry Howland (Amity Ditch), Glenn Wilson (Amity Ditch), Bill Orendorff (Amity Ditch), Greg Naugle (Colorado-WQCD), Dick Parachini (Colorado-WQCD), Mark Rude (GMD3), Chris Law (GMD3), Trevor Ahring (GMD3), Jason Norquest (GMD3); Rachel Claucherly (DWR), Brandy Cole (DWR), Kevin Salter (DWR), Tom Stiles (KDHE), Susan Stover (KWO) and Diane Coe (KWO)

Welcome and Introductions- Chairman Clark Rusco welcomed all and self introductions were made.

BAC Approval of Agenda- Motion was made to approve the agenda as presented by Paul Tschopp, seconded by Mick MacNair and approved.

Agency Reports -

DWR – Kevin Salter introduced new DWR employee for Compact Compliance, Rachel Claucherly. Kevin also reported that flows at the state line are very low right now, at 30-40 cfs. He also noted that conditions are right to see over pumping this year, but the passage of flex account legislative changes should address the problems.

KWO - Susan Stover reviewed legislation passed this year related to water including water right conservation program with user based fees to support it and the interstate litigation fund. Susan also reviewed the FY 2012 Water Plan Budget pointing out the CREP and WTAP (voluntary conservation programs) are available and the LEPP is not funded through the Water Plan but was funded for one year by the legislature. Discussion included the funding of the Wichita ASR and the fertilizer and pesticide fees into the Water Plan fund. She also noted the new KWA chair is Gary Harshberger of Dodge City.

Susan provided an update on the Ogallala issue activities, also outlined in a memo sent prior to the meeting. These activities include the priority area management discussion (*Sheridan 6 area*) in Northwest Kansas, limited irrigation insurance, the KWA ad hoc committee and Governor Brownback's Ogallala Summit July 21st.

The ad hoc committee of KWA members and key stakeholders will study the issue of water (then advise Gov/Legislature on changes in 2012 session).

MEMBERS:

CLARK RUSCO
CHAIRPERSON
Fish and Wildlife
Great Bend, KS

BEVERLY KOMAREK
Domestic
Great Bend, KS

JAMIE CHEATUM
Agricultural Industry
Syracuse, KS

MICHAEL MACNAIR
Conservation/
Environment
Jetmore, KS

PAUL TSCHOPP
Industry/Commerce
Ellinwood, KS

RANDY HAYZLETT
Surface Water Irrigation
Lakin, KS

ROGER MOHR
Ground Water Irrigation
Albert, KS

STEVEN COTTRELL
Municipal Public Water
Supply
Garden City, KS

STEVEN HINES
Agriculture
Coolidge, KS

For questions please
contact:
Diane Coe
Basin Planner
785-296-3185
diane.coe@kwo.ks.gov

Discussion on the limited irrigation insurance program under development by Risk Management Agency (RMA) resulted in a desire of the BAC to get more program details from RMA at a future meeting.

GMD3 – Mark Rude reported that there will be some public water supply water quality work in Hamilton and Kearny counties if the GMD is successful in obtaining a Bureau of Reclamation grant. Mark noted that the CREP funds that originated from the Compact damages were swept by the Governor, removing them from use in the affected area. Efforts to restore the funds resulted in them being combined with WTAP. The water conservation practices under these two programs administered by the State Conservation Commission will be approved on a first come basis, independent of the specific program. He added that the river gage funding is also needed for management and compliance with the compact. A source for gage funding was provided by the legislature.

Public Comments - There were no public comments offered.

BAC Business

Approval of the March 2010 Meeting Notes - Steven Hines made a motion **to approve the March 2011 meeting notes** as presented. The motion was seconded by Jamie Cheatum. The motion carried.

KWA Update included Diane Coe reporting that a *Reservoir Advisory Committee* has been formed, comprised of state agencies and other stakeholders to evaluate options and develop a plan for the protection of future reservoir sites. They will provide input on potential criteria to be used in the evaluation of suitable future storage sites, not site recommendations.

An Aquatic Nuisance Species Management Policy - working draft has been drafted for incorporation into the *Kansas Water Plan*. The statewide Policy defines the problems and impacts of ANS as well as outlines recommendations and implementation strategies to manage ANS in the State of Kansas. The implementation strategies outlined in the Policy include: Education, Funding, Research, Coordination, Legislation and Administrative Changes

Stream Mitigation Guidance Review information was provided in an April 19 memo from Susan Metzger. Coordinate stakeholders (also SAKW) to review and comment on guidance related to evaluation of projects that require 404 permit.

EPA is taking comments on the *Guidance on Waters of the US*. A brief memo dated May 23 from Susan Metzger provides a link to that guidance if anyone wants to comment. There is a power point on KWO web site which summarizes the guidance
[http://www.kwo.org/Water%20of%20US%20EPA%20guidance %20KDHE_06022011.pdf](http://www.kwo.org/Water%20of%20US%20EPA%20guidance%20KDHE_06022011.pdf) .

BAC member reports on activities related to their member category and issue topics

Agriculture – Steven Hines reported that the Frontier Flume and the Amazon Head Gate projects are starting up. The contracts for consultants are signed, with construction work to begin after the irrigation season.

Surface Water Irrigation – Randy Hayzlett reported that the South Side and Lake McKinney projects are complete. He also noted that the Compact is looking for a new chairman as Robin Jennison has resigned.

Membership

Motion was made by Steven Hines to nominate the current members applying to their current categories, Hugh Brownlee for At Large, and Josh Hobbs for Recreation. The motion was seconded by Randy Hayzlett. Motion carried.

The recommendations are: Mick MacNair for Conservation/Environment; Steve Cottrell for Municipal PWS, Roger Mohr for Ground Water Irrigation; Jamie Cheatum for Agricultural Industry; Hugh Brownlee for At Large; and Joshua Hobbs for Recreation Motion.

Basin Activities/Updates-

GMD3 Groundwater Model – Don Whittemore provided an overview of the GMD3 hydrologic model recently completed by the Kansas Geological Survey. Conclusions include:

- Average precipitation recharge 1946-2007: 0.41 in/yr.
- Decline in GMD3 aquifer water storage 1946-2007: 31%
- Pumping exceeded precipitation recharge by 6-8 times during last decade.
- If pumping continues with no policy change, storage will decline 41% from 2007 to 2068 in GMD3.
- Substantial areas of High Plains aquifer in southwest Kansas will not support irrigation pumping in 2068.
- GMD3 allocation would slow aquifer decline if ratio of actual water used/reallocated water is similar to today.
- The main impact of CREP is to slow aquifer decline in local areas around retired water rights.

Discussion noted that an estimated 80-90% of the pumping wells would need to stop pumping to stabilize the water levels.

Water Quality Discussion

Tom Stiles provided introductory remarks concerning the Arkansas River water quality in Colorado and Kansas. He noted that the salts and related water quality continues to increase in complicity as additional parameters are considered.

WQ Studies on Lower (CO)/Upper (KS) Arkansas River

Kansas Uranium Study – Don Whittemore provided an overview of results of a recent study of the variations and loads of uranium in the river. The source of the uranium is natural however the concentrations are not.

Conclusions include:

- Uranium in the Arkansas River in the upper part of the Upper Arkansas basin area usually exceeds the drinking-water MCL of 30 µg/L.
- Uranium concentration is well correlated with conductance in the Arkansas River in southeast Colorado and southwest Kansas, allowing estimation of loads from conductance monitoring.
- Saline river water captured in the now generally closed basin in southwest Kansas is contaminating water supplies in the aquifer to over the drinking-water uranium criterion along parts of the river valley.

Discussion included soil testing, and if and where higher concentrations have been noted.

Colorado State University Studies - Greg Naugle presented information developed by Dr. Timothy Gates (CSU) on selenium in the Lower Arkansas River Basin, Colorado. The Cretaceous shales are the suspected source of selenium with concentrations increasing downstream. The work, still in progress, is designed to model the transport and transformation (cycle) of selenium in soils and water. This includes mass balance, leaching and loading to the river. Then BMP alternatives can be developed to address the loading.

Discussion of options to relocate fields in high concentration areas (hot spots) included an Agricultural Water Enhancement Program (AWEP) and the need for additional information for Natural Resource Conservation Service (NRCS) to enable them to work with operators. Suggestions included the Conservation Security Reserve Program and working with the Colorado State Technical Committee toward an AWWP.

Conditions – Tom Stiles discussed the impairments to various reaches of the Arkansas River, Kansas and Walnut Creek. Sulfate and selenium have been issues, with concentrations continuing to increase. Uranium is an emerging issue as the drinking water standard of 30 ug/L must be met by public water supplies. E Coli and phosphorus are also concerns.

Activities/Listings/Future Plans – Tom discussed the Kansas approach to nutrient reduction through load reduction which in turn will work towards a numeric criterion. Activities to address loading involve WRAPs for non point sources and the regulation of point sources.

Tom provided the status of TMDLs and impairments in the Upper Arkansas River Basin, Kansas. Anticipated activities in 2011 and 2012 include continued coordination with Colorado on watershed planning and implementation (nutrients and salts). Colorado TMDLs and Kansas TMDLs. Anticipated Kansas TMDLS, fall 2011 are state line uranium/gross alpha, selenium downstream Arkansas River and Walnut Creek, and older marginal listings of lakes, dissolved oxygen, fluoride, and atrazine.

Other Business:

Messages to the Kansas Water Authority-

- 1) Randy Hayzlett made the motion to send the following message. The motion was seconded by Steve Cottrell and carried.

The Upper Arkansas BAC recommends the restoration of CREP funds derived from the KS V Co litigation and the restoration of the Attorney Generals litigation fund.

- 2) Steven Hines made the motion to send the following message to KWA. The motion was seconded by Mick MacNair and carried.

The BAC is concerned that the new Colorado Super Ditch will market Colorado ditch water from ditches west of John Martin Dam to Colorado municipalities, which could be out of the Arkansas Basin and may have the potential to affect the conservation pool in John Martin and flows into Kansas at the state line.

Future BAC Meeting Date in Sept – Oct 2011 will be determined by the chair and planner.

The meeting adjourned with a motion made by Mick MacNair, seconded by Steve Cottrell and carried. |

MEMO



DATE: August 23, 2011
TO: Basin Advisory Committee Members and Advisors
FROM: Earl Lewis
RE: FY 2013 State Water Plan Fund Budget Recommendations

901 S. Kansas Avenue
Topeka, KS 66612
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www.kwo.org

At their meeting on August 12th, 2011, the Kansas Water Authority (KWA) approved budget recommendations for the Kansas Water Plan Fund in 3 distinct pieces – A Water Plan Fund “Base Budget”, the State General Fund demand transfer, and the Expanded Lottery and Gaming Fund (ELARF). Each of these is described in more detail and a handout for each component is attached.

The committees will be provided an overview at your meeting. Any input you have will be shared with the KWA at their November meeting as they discuss their report to the Governor and the FY 2012 Legislature on recommendations to implement the Kansas Water Plan.

State Water Plan Fund “Base Budget”

The KWA approved recommendations for \$13.3 million of water plan dollars. This is based on the revenue estimate with NO state general fund demand transfer. On the attached table, you see the listing of agencies’ programs that are funded with the state water plan funds. One significant addition in FY 2013 is funding for Aquatic Nuisance Species in the Kansas Department of Wildlife, Parks and Tourism’s budget. The KWA approved the addition of the policy issue to the Kansas Water Plan.

You will note 3 highlighted program lines. The funding for these programs will be reviewed again at the November KWA meeting.

Assessment and Evaluation: This line is increased by \$40,000 for the purpose of initiating a real time notification system for taste and odor for drinking water utilities using the Kansas River as a source of supply. The KWA requested that the funding be contingent on the utilities participating in funding. The KWA also requested that the price of the study be negotiated to reduce the overall cost.

Weather Stations: This line is shown zeroed out. The KWA requested that the KWO work with K-State and stakeholders who use the stations to determine the accuracy and usage of the stations.

Weather Modification: After extensive discussion, the KWA identified \$90,000 for weather modification. Potentially eliminating water plan funding was discussed due to the eroding support on the part of the counties in the target area. Support on the part of the counties and the GMD will be reviewed.

State General Fund Demand Transfer

The second piece of the FY 2013 SWP fund budget is dependent on the reinstatement of the statutory State General Fund demand transfer. The KWA has supported the development of a new program with the KDA-DOC focused on implementation of nutrient and sediment reduction projects. This voluntary program would be administered through the conservation districts to implement projects that have been locally identified to address nutrient and sediment projects through watershed restoration and protection or TMDL planning efforts.

Proposal for FY 2013 ELARF Water Projects

The third piece of the KWA recommendations on the FY 2013 budget is the identification of projects that would utilize an allocation of 10% of the ELARF funds. The estimate for FY 2013 is \$8.5 million. The projects are described on the attached sheet.

State Water Plan Fund: FY2012 - FY2013

Agency/Program	FY 2012 Legislative Approved	FY 2013 Proposal w/o ANS	FY 2013 Proposal with ANS	FY 2013 KWA Budget Committee changes
Department of Health and Environment				
Contamination Remediation	\$ 790,118	\$ 775,000	\$ 775,000	\$ 775,000
TMDL Initiatives	\$ 237,097	\$ 200,000	\$ 200,000	\$ 200,000
Local Environmental Protection Program		\$ -	\$ -	\$ -
Nonpoint Source Program	\$ 374,044	\$ 300,000	\$ 300,000	\$ 300,000
Watershed Restoration and Protection Strategy	\$ 716,351	\$ 625,000	\$ 625,000	\$ 625,000
Total--Department of Health and Environment	\$ 2,117,610	\$ 1,900,000	\$ 1,900,000	\$ 1,900,000
University of Kansas--Geological Survey				
	\$ 26,841	\$ 30,000	\$ 30,000	\$ 30,000
Department of Agriculture-DWR				
Interstate Water Issues	\$ 513,850	\$ 460,000	\$ 460,000	\$ 460,000
Subbasin Water Resources Management	\$ 702,722	\$ 640,389	\$ 619,220	\$ 619,220
Water Use	\$ 83,697	\$ 60,000	\$ 60,000	\$ 60,000
Sub-total--Department of Agriculture-DWR	\$ 1,300,269	\$ 1,160,389	\$ 1,139,220	\$ 1,139,220
Department of Ag-Division of Conservation				
Water Resources Cost Share	\$ 2,138,055	\$ 2,108,000	\$ 2,008,700	\$ 2,008,700
Nonpoint Source Pollution Asst.	\$ 2,424,078	\$ 2,108,222	\$ 2,008,691	\$ 2,008,691
Aid to Conservation Districts	\$ 2,259,754	\$ 2,260,000	\$ 2,260,000	\$ 2,260,000
Watershed Dam Construction	\$ 690,652	\$ 690,000	\$ 690,000	\$ 625,000
Water Quality Buffer Initiative	\$ 196,394	\$ 270,000	\$ 270,000	\$ 270,000
Riparian and Wetland Program	\$ 164,828	\$ 165,000	\$ 165,000	\$ 165,000
Water Supply Restoration Program	\$ 255,043	\$ 255,000	\$ 255,000	\$ 190,000
Water Transition Assistance Program/CREP	\$ 824,835	\$ 425,000	\$ 425,000	\$ 425,000
Sub-total--Dept of Ag-Division of Conservation	\$ 8,953,639	\$ 8,281,222	\$ 8,082,391	\$ 7,952,391
Total--Department of Agriculture	\$ 10,253,908	\$ 9,441,611	\$ 9,221,611	\$ 9,091,611
Kansas Water Office				
Assessment and Evaluation *	\$ 469,492	\$ 500,000	\$ 500,000	\$ 540,000
GIS Data Base Development	\$ 173,640	\$ 200,000	\$ 180,000	\$ 170,000
MOU - Storage Operations and Maintenance	\$ 366,802	\$ 360,364	\$ 360,364	\$ 360,364
Technical Assistance to Water Users	\$ 409,044	\$ 433,000	\$ 433,000	\$ 413,000
Weather Stations *	\$ 48,620	\$ 30,000	\$ 30,000	\$ -
Water Resource Education	\$ 38,200	\$ 45,000	\$ 45,000	\$ 45,000
Weather Modification *	\$ 97,935	\$ -	\$ -	\$ 90,000
Wichita Aquifer Recharge Project	\$ 657,459	\$ 400,000	\$ 390,000	\$ 500,000
Neosho River Basin Issues	\$ -	\$ -	\$ -	\$ -
Total--Kansas Water Office	\$ 2,261,192	\$ 1,968,364	\$ 1,938,364	\$ 2,118,364
Department of Wildlife and Parks				
ANS		\$ -	\$ 250,000	\$ 200,000
Stream (Biological) Monitoring	\$ -	\$ -	\$ -	\$ -
Total--Department of Wildlife and Parks	\$ -	\$ -	\$ 250,000	\$ 200,000
Total State Water Plan Expenditures	\$ 14,659,551	\$ 13,339,975	\$ 13,339,975	\$ 13,339,975

State Water Plan Resource Estimate	FY 2012 Legislative Approved	FY 2013 Proposal w/o ANS	FY 2013 Proposal with ANS	FY 2013 KWA Budget Committee changes
Beginning Balance	\$ 888,621	\$ (82,288)	\$ (82,288)	\$ (82,288)
Adjustments				
Standardized Water Data Fund Transfer	\$ 300,000			
Feral Swine Eradication Fund Transfer	\$ (175,000)			
Livestock Market Report Fund Transfer	\$ (20,000)			
Grain Warehouse Inspection Fund Transfer	\$ (75,000)			
Transfer to Kansas Corporation Commission	\$ (400,000)	\$ (364,000)	\$ (364,000)	\$ (364,000)
Subtotal--Adjustments	\$ (370,000)	\$ (364,000)	\$ (364,000)	\$ (364,000)
Revenues				
State General Fund Transfer	\$ -	\$ -	\$ -	\$ -
Economic Development Fund Transfer	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
Fee Revenue	\$ 12,058,642	\$ 11,786,263	\$ 11,786,263	\$ 11,786,263
Total Receipts	\$ 14,058,642	\$ 13,786,263	\$ 13,786,263	\$ 13,786,263
Total Available	\$ 14,577,263	\$ 13,339,975	\$ 13,339,975	\$ 13,339,975
Less: Expenditures	\$ (14,659,551)	\$ (13,339,975)	\$ (13,339,975)	\$ (13,339,975)
Ending Balance	\$ (82,288)	\$ -	\$ -	\$ -

* these budget recommendations will be re-visited in November by the KWA to determine if the funding is warranted at the recommended level. Should the funding levels be modified, the KWA will advise the Governor and Legislature of the amended recommendations.

DRAFT

FY 2013 SWPF Budget Request – Nutrient and Sediment Reduction

Amount: \$6,000,000 – dependent upon reinstatement of the statutory State General Fund demand transfer.

Agency: Kansas Department of Agriculture, Division of Conservation (KDA-DOC)

Purpose: Fund implementation of nutrient and sediment reduction practices in high priority areas.

Background: Excess nutrients in Kansas waters have caused algal blooms leading to suspension of drinking water production, interruption of recreational access to lakes and reservoirs, increased drinking water production costs, fish kills, and toxicity to livestock and domestic animals. Reservoirs are integral to Kansas' water supply infrastructure, providing water supply for more than two-thirds of the state's population. Sedimentation is impacting these reservoirs, reducing the capacity to store water to meet our needs.

Development of a new program within the KDA-DOC will allow for a more targeted approach in reducing sedimentation and nutrient loading into waterways and reservoirs.

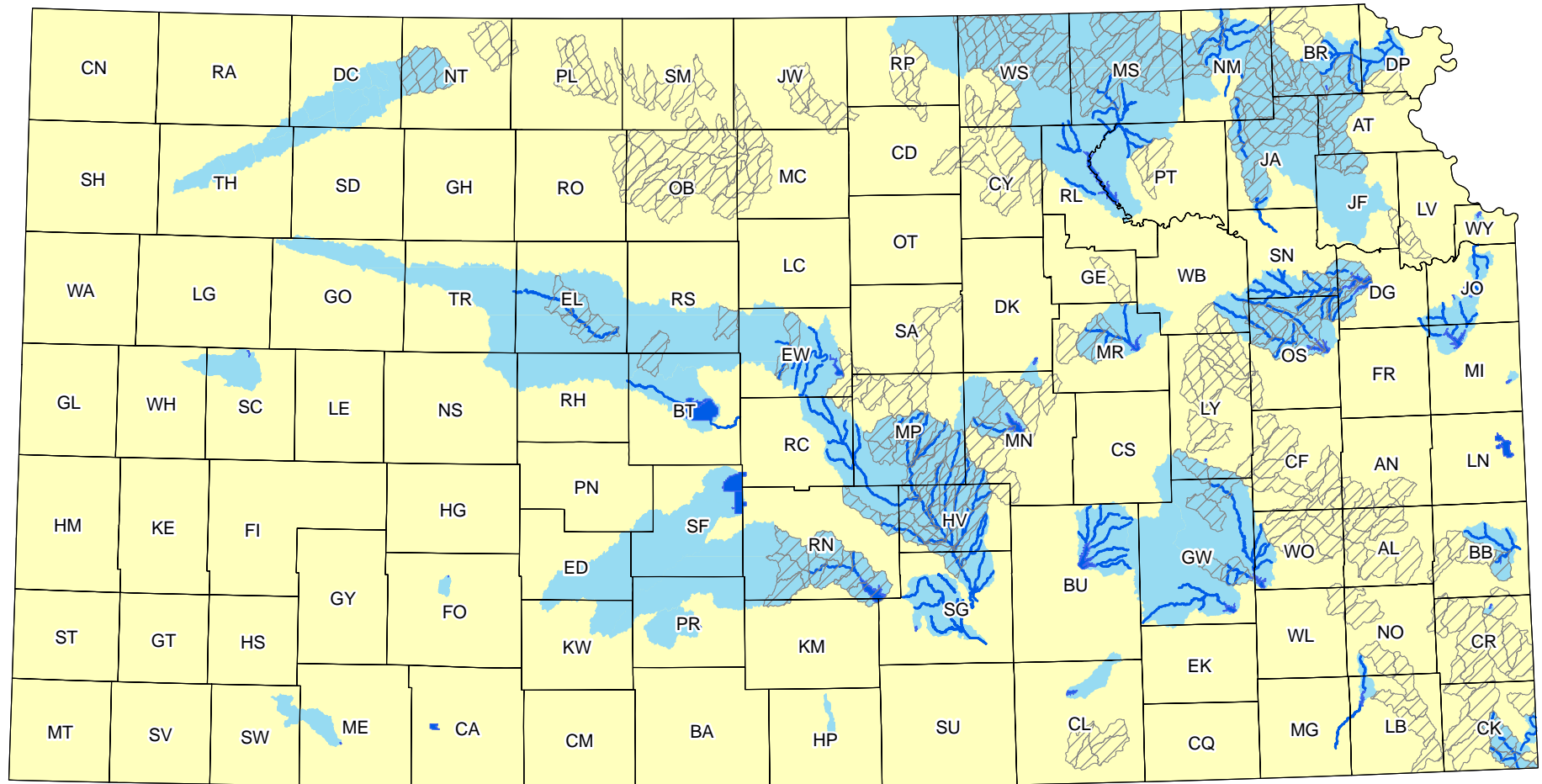
The program, as proposed, would link existing efforts by local Watershed Restoration and Protection Strategy (WRAPS) groups with implementation efforts through conservation districts. Local WRAPS Stakeholder Leadership Teams (SLTs) have, in many cases, now developed the required 9-element plans that can lead to implementation. The completed or draft plans to date (18 plans representing about 50% of the WRAPS groups) identify more than \$7 million per year in estimated best management practices (BMPs) needed to achieve their water quality goals, chiefly tied to achievement of Total Maximum Daily Loads (TMDLs) for nutrients and sediment.






WRAPS coordinators are in a prime position to help identify projects that will have the most benefit to meet the goals of those plans. Local conservation districts are already well equipped to efficiently provide the cost share programs to local producers. Having WRAPS coordinators work with local producers to obtain cost share through the conservation districts will insure program dollars are spent on the highest priority projects. In some situations, high priority nutrient and sediment TMDLs that are not addressed in WRAPS plans may be identified as a critical need; these, too, would be eligible for this program (see attached map).

Due to the voluntary nature of the program and the fact that watersheds span multiple counties, the program would be an "on demand" funding mechanism rather than a county allocation approach. The local conservation district would request funding for each project, or group of

projects, once they are identified. State agency staff would prioritize and respond to funding requests based on highest nutrient reduction for dollar spent.

Best Management Practice (BMP) Implementation Areas to Address Nutrients and Sediment



-  Watershed Plan Priority HUC 12 Watershed (Tier 1 Funding Priority Areas)
-  High Priority TMDL Watershed (Tier 2 Funding Priority Areas)
-  High Priority TMDL Lake/Wetland/Wildlife Area (Tier 2 Funding Priority Areas)
-  High Priority TMDL Stream (Tier 2 Funding Priority Areas)
-  County Boundary

Proposal for FY 2013 ELARF Water Projects

In recent years, the Kansas Water Authority has request an allocation of 10% of the expanded gaming revenues for water related projects. This overall request remains in place and the following are the suggested projects to be included with the Kansas Water Authority budget recommendations for FY 2013. The current estimate for 10% of the ELARF revenues for FY 2013 is \$8.5 million.

Conserving and Extending the Useful Life of Aquifers – \$2,900,000

Improved Irrigation Systems Efficiency and Management – \$1,000,000

To maintain the current crop production levels and reduce total irrigation water use, technological and management improvements are essential. Agricultural engineers state the possibility of reducing irrigation water use by 25% with an energy savings of 35%, which would result in a net economic improvement to the individual producer and his/her community. Funding will allow for demonstrations of these water and energy saving technologies.

Water Right Purchase – \$1,000,000

The High Plains aquifer, particularly the Ogallala portion, is over developed in most areas in Kansas. Long term declines indicate the current level of use is unsustainable. Additional funding is essential to expand the Water Transition Assistance Program (WTAP), which allows the state to purchase and permanently retire water rights in priority areas that are closed to new appropriations. This program is essential to conserve and extend the life of the Ogallala aquifer.

Market Based Seed Grants – \$300,000

Stimulating new industry and/or value added agriculture that uses less total water than irrigation is critical in transitioning western Kansas to a lower water use economy. A key component to Governor Brownback's approach is economic development. Grant funding would be leveraged with additional funding opportunities for applicants to develop and implement innovative approaches and business ventures for western Kansas.

Aquifer Storage and Recovery – \$600,000

Aquifer storage and recovery is a method of capturing high flow events and storing water underground. The City of Wichita has successfully implemented an aquifer storage and recovery (ASR) project that captures high river flows in the Little Arkansas River and stores the water in the Equus Beds aquifer. This benefits the city by reducing reliance on surface water and reduces the salt contamination of the aquifer. This funding will provide opportunities for research of additional ASR projects throughout the state.

Reservoir Restoration and Protection – \$3,800,000

Storage Restoration – \$1,500,000

Dredging involves the physical removal of accumulated sediment through mechanical, hydraulic, or pneumatic means. Funding is needed to ensure projects within the Water Supply Restoration program for reservoir dredging and disposal of dredged materials are carried out in a timely manner.

Streambank Stabilization –\$1,000,000

Growing evidence shows that a significant source of sediment in streams is generated from stream channels and edge of field gullies. Streambank erosion can contribute nutrients such as phosphorus, which can cause water quality impairments. Funding is needed to continue the process of implementing reach-based streambank stabilization.

Dam Rehabilitation – \$1,000,000

There are nearly 6,000 dams in Kansas regulated by the Department of Agriculture, Division of Water Resources. With an average age of 40 years, some dams are exhibiting structural deficiencies, while post-construction development of others has raised their hazard classes. Funding is needed to meet the financial requirements for small dam rehabilitation and upgrades.

Reservoir Data Analysis System – \$300,000

Establish a continuing program of integrated reservoir assessment as a part of a broader statewide effort to understand, predict, and plan for the numerous challenges facing the reservoirs that supply drinking water to much of the state.

Improving and Protecting Waters - \$1,000,000

Aquatic Nuisance Species Protection – \$750,000

Aquatic nuisance species (ANS) have invaded Kansas lakes and streams and expanded populations continue to be discovered in Kansas aquatic environments. Funding would be targeted towards education, inspections and enforcement to reduce the spread of ANS in Kansas.

Remediation of Contaminated Sites – \$250,000

The Contamination Remediation Program was developed with the specific objective of providing a mechanism to address sites where the responsible party is not known, or is not viable and where there are no federal, state, or other funding sources available to complete required investigation and cleanup activities. Funding will be used to actively investigate, remediate and monitor sites in which contaminants have impacted soil, ground water and/or surface water in the state.

Improved Monitoring and Data Collection – \$800,000

LiDAR Data Acquisition - \$500,000

High resolution evaluation data will be derived from Light Detecting and Ranging (LiDAR) technology. Data will be useful for flood emergency management, community planning, reservoir sustainability research and other water resource evaluations.

Expanded Streamgage Network – \$100,000

Streamflow data from U.S. Geological Survey (USGS) stations are used by federal, state and local government for planning and decisions related to agriculture, industry, urban water supplies, riverine and riparian habitat and flood hazard identification. An expanded streamgage network would enhance the state's ability to plan during times of drought and flood, as well as, to monitor Interstate Water Compacts.

Expanded Weather Station Network – \$100,000

Data from automated weather stations is an important tool for the management of water resources. Several networks of these stations exist across the state, each designed to meet specific purposes. Funding will be focused on maintenance and operation of existing stations, development of new stations, and upgrading of network support capabilities.

Suspended Sediment Monitoring - \$100,000

The purpose of the network is to characterize suspended sediment transport and deposition in Kansas reservoirs. The information gained from the network will be used to implement management strategies to reduce sedimentation and increase available water supply.

Kansas Water Plan

Aquatic Nuisance Species Management

August 2011

Issue

Aquatic nuisance species (ANS) have invaded Kansas lakes and streams and expanded populations continue to be discovered in Kansas aquatic environments. ANS, also called invasive species, are not only detrimental to native species in Kansas; they also cause problems for recreational activities, such as boating and fishing, municipal and industrial users and even agricultural producers. Two aquatic invasive species that are of particular concern are the Zebra mussel and the Asian carp.

While state laws exist to manage ANS, lack of funding for education, inspections and enforcement limits effective implementation of these laws resulting in continued spread of these species.

Background

Aquatic nuisance species represent a potential threat to the environment, as well as a threat to water suppliers, industry, power generation and ultimately, the economy. The negative impacts of ANS include:

- Clogged water intakes
- Possibility of burned out water pumps and pivots
- Clogged and damaged power generating equipment
- Decreased recreational opportunities
- Increase flooding risk due to clogging of water control structures
- Bioaccumulation of toxins in waterfowl
- Changes in water quality
- Increased algal blooms
- Habitat degradation
- Decreased property value

Zebra Mussels

Zebra mussels, *Dreissena polymorpha*, produce free-floating microscopic larvae, which enables aquatic users to unknowingly transport them between water bodies and allows them to easily infest facilities through surface water intakes. Zebra mussels are native to the Black and Caspian seas of Europe. They were introduced to the Great Lakes Region in 1988 through the purging of ballast waters of cargo ships. Since that time they, and their cousin the Quagga mussel, have infected water bodies across the nation (Figure 1).

Zebra mussels were first confirmed in the state in 2003 in Eldorado Reservoir in the Walnut River Basin in south central Kansas. Since that time, Zebra mussels have spread to nine other Kansas lakes, including Lake Afton, Winfield City Lake, Cheney Reservoir, Perry Reservoir, Wilson Reservoir, Marion Reservoir, Milford Reservoir, Council Grove City Lake and John Redmond Reservoir.

Once introduced, new populations of Zebra mussels expand quickly. The last confirmed was in John Redmond Reservoir in July 2010. It is likely that Zebra mussels will move downstream in the Neosho River and infest Council Grove Reservoir and Coffey County Fishing Lake (Wolf Creek Lake). Zebra mussels were confirmed in Perry Reservoir in 2007 and as of October 2009 their presence was confirmed by various municipalities and industries downstream along the Kansas River.

Nationwide expenditures to control Zebra mussels in water intake pipes, water filtration equipment, and electric generating plants are estimated around \$1 billion per year. Due to the high economic impact that Zebra mussels can have on water intake systems, the Kansas Department of Wildlife, Parks, and Tourism (KDWPT) and the Kansas Water Office (KWO) have notified those municipalities and industries in the affected basins of the infestations and the need to protect their facilities.

Asian Carp

Asian carp are another invasive species that can be costly and even dangerous to those who use Kansas waters. The aquatic nuisance group of Asian carp consists of three species. Common names for these three species are the Bighead carp, the Silver carp, and the Black carp. Asian carp are a problem because they directly compete with native fish for food resources and grow quickly, consuming 40 percent of their body weight every day. Black carp are particularly detrimental to native snails and mussels, as they feed exclusively on them. Silver carp, distinctively pose a threat to boaters as they will leap out of the water when disturbed by boat motors and can cause injury.

Asian carp have received increased publicity due to their noticeable population increase in both the Kansas and Missouri Rivers in the summer of 2010. As reported by KDWPT, Asian carp have been reported in increased populations below Bowersock Dam in Lawrence, below WaterOne's weir in Johnson County and below the dam at Atchison State Fishing Lake. Asian carp can now be found in the Big Blue, Kansas, Missouri, and Wakarusa rivers and in any stream that connects to the Kansas and Missouri rivers.

Additional ANS Animal Species

While Zebra mussels and Asian carp are certainly the poster children for ANS, the list of invasive species does not end there. Additional ANS include White Perch, Rudd, Ruffe, Rusty Crayfish, Round Goby and New Zealand mudsnails. These species are detrimental because they displace the native aquatic species from prime habitat and spawning areas. ANS also disrupt the food chain by eating eggs and young fish of native species, feeding on baitfish utilized by other species, and consuming algae, which competes with native aquatic species. Another problem with these ANS species is some of them are capable of hybridizing with native aquatic species.

ANS Plants

Aquatic Nuisance Species do not just include animal species, but plants as well. Plants considered invasive in Kansas include, but are not limited to: Eurasian watermilfoil, Hydrilla and Salt Cedar. Many invasive species of plants outcompete native pond and wetland plant species. This can affect the plants they are outcompeting as well as the native animals that depend on that habitat and food source. ANS plants also inhibit flow and can sometimes hinder recreational activities.

A complete list of both animal and plant species can be found listed on the KDWPT website. <http://www.kdwp.state.ks.us/news/Fishing/Aquatic-Nuisance-Species>

Of the ANS plants, the phreatophyte Salt Cedar, also referred to as Tamarisk, is a serious concern for Kansas. In the 2009 update of the *Kansas Water Plan* (KWP), Salt Cedar was noted as a primary problem affecting both water quantity and quality. Salt Cedar can also outcompete native obligate phreatophytes during drought periods. http://www.kwo.org/Kansas_Water_Plan/KWP_VolumeIII.htm

In 2005 the Governor signed a 10-Year Strategic Plan for the Comprehensive Control of Tamarisk and Other Non-Native Phreatophytes. That plan can be accessed using the following link: http://www.kwo.org/reports_publications/Reports/Rpt_Tamarisk_10-Year_Plan_FINAL_120805_sm.pdf

Salt Cedar is also listed in the Kansas Aquatic Nuisance Species Management Plan.

Kansas Water Plan Objectives

Recreation

Increasing recreational opportunities at the lakes, rivers and streams of Kansas is an objective of the *KWP*. A key policy issue identified in surveys conducted by the KWO and KDWPT is that demand for water-based recreation exceeds present

availability. The presence of ANS in any of the recreational areas can have detrimental impacts. ANS can decrease the quality of the recreational experience or eliminate it all together. With decreased or eliminated recreation an area can suffer economically.

It is best to protect recreational areas from the infestation of ANS. However, protecting them can become difficult with the multitude of access points and lack of enforcement staff. In order to protect these valuable resources additional funding will be needed to hire and train essential enforcement staff and to educate user groups on ways to protect their resource and prevent infestations.

Public Water Supply

Kansas has approximately 1,100 public water supply systems, serving approximately 2.6 million Kansas residents. Public water supply systems are typically managed by a public entity, such as a municipality or a rural water district, but may also be managed privately. The governing bodies of public water supply systems bear primary responsibility, and cost for providing an adequate supply of high quality drinking water to the public.

With the threat of ANS, providing adequate high quality drinking water will be more difficult and costly. Public water suppliers will have to install chemical or mechanical means of treatment or removal of ANS such as Zebra mussels. This will not only add additional steps to the water treatment process, but will also add additional costs in order to provide quality drinking water. Another adverse side affect is by adding additional copper or potassium to the water. The environmental levels of these chemicals will increase which can be detrimental to native aquatic species and possibly humans.

Existing Approaches

Kansas Aquatic Nuisance Species Management Plan

The *Kansas Aquatic Nuisance Species Management Plan* was approved by the Governor in 2005. <http://www.kdwp.state.ks.us/news/Fishing/Aquatic-Nuisance-Species/KS-Nuisance-Species-Plan>

The plan is designed to protect Kansas residents and the state's aquatic resources from the multitude of potential losses associated with ANS plants and animals. Actions outlined in the Management Plan focus on the listed priority species and their pathways of introduction.

Since adoption of the Plan in 2005, the KDWP has been increasing and improving their capacity to prevent, control, contain, or eradicate ANS in Kansas while partnering with other Kansas natural resource agencies. Federal grant assistance, in addition to generous private donations, has provided the primary funding mechanism for ANS management in Kansas, but more is needed. In comparison to other states Kansas lags behind in funding from both federal and states resources. Below is a comparison between states and the funding amounts they received in 2008. In 2010 the Kansas ANS Program only received \$65,048 from federal funding and \$0 from state funds.

Funding limitations have made comprehensive ANS management difficult and a consistent source of funding to further develop ANS prevention and enforcement program capacity is needed. Legislative action is necessary to further the success of the ANS management program in Kansas and suggested actions are outlined in the Implementation Portion of the Recommendations in this policy paper.

Legislation

Several pieces of national legislation allow Kansas to work towards the control and prevention of ANS and to participate in federal cost-share programs to receive funds to help manage ANS.

Passed in 1900, the Lacey Act is the nation's first far-reaching federal wildlife protection law. This law helps control the movement of ANS, while also protecting native species from introduction of ANS.

In 1990 the Nonindigenous Aquatic Nuisance Prevention and Control Act was established to limit the spread of ANS. Then in 1996 the National Invasive Species Act was established to provide opportunity for federal cost-share support to states, including Kansas, to help manage ANS.

In 1999 Executive Order 13112 established The National Invasive Species Council (NISC) to ensure that Federal programs and activities to prevent and control invasive species are coordinated, effective, and efficient.

In 2008, Kansas Senate Bill 606 was introduced which would have specified that fines and grants would fund ANS control efforts and would have also created an aquaculture advisory council. The bill failed to move out of committee. Nothing since has been introduced in the Kansas legislature and the program has continued to operate with minimal funding resulting in widespread negative impacts.

A National Look

ANS are the cause of significant ecological and socio-economic problems for water users in North America. ANS have spread beyond historic ranges and have adversely affected infested waters by threatening the integrity of the water resources. Since ANS have few natural controls in their new habitats, they spread rapidly, destroying native plant and animal habitat, threaten the diversity and abundance of native species, and damage industrial, agricultural and recreational activities dependent on surface waters. Currently there are 36 approved State ANS Management Plans, which includes 33 states and three Interstate Plans (Figure 4). It is vital to have all states involved as ANS are easily transported across state lines.

To ensure implementation of these plans many agencies and organizations, nationwide, must work together. A brief list of those agencies and organizations with responsibility for the control and prevention of ANS are listed below.

Federal Agencies:

U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
U.S. Coast Guard

Regional Organizations:

The Western Regional Panel
The Mississippi River Basin Regional Panel
Western Governors Association

Statewide:

Kansas Department of Wildlife, Parks, and Tourism
Kansas Department of Agriculture
Kansas Department of Health and Environment
Kansas Water Office

ISSUES AND RECOMMENDATIONS

ANS have expanded populations in Kansas lakes and rivers and are detrimental to native species. They can cause problems for recreational activities, such as boating and fishing, municipal and industrial users and even agricultural producers. There are national, regional and statewide efforts to control and prevent these invasive species, but there is still work that needs to be accomplished. To implement parts of the Kansas Aquatic Nuisance Species Management Plan, additional education, enforcement, and funding are needed. The following recommendations will help accomplish this goal.

RECOMMENDATIONS

Education

1. Educate resource user groups about the risks and impacts of ANS and how to reduce their spread and harmful impacts.
2. Promote education and seek local input through the state's Basin Advisory Committees.

Funding

1. Secure a funding source to implement the Kansas Aquatic Nuisance Species Management Plan.

Research

1. Continue an evaluation of the most effective and cost-efficient control measures for ANS.

Coordination

1. Continue to work with federal, state, and local agencies and other groups to implement the *Kansas Aquatic Nuisance Species Management Plan*.

Legislation and Administrative Changes

1. Introduce legislation to establish means of preventing the spread of ANS.
2. Administratively change current regulations to prevent the spread of ANS.

IMPLEMENTATION

Education

1. Development and dissemination of materials to educate the general public through various media.
2. Development and dissemination of materials to schools to assist educators.
3. Training of law enforcement officers to conduct inspections and identify and respond to ANS.
4. Provide ANS information to numerous public venues.
5. Continue training for state personnel and expand to other interested entities. Personnel will be trained in the concepts of Hazard Analysis and Critical Control Point (HACCP).

Funding

1. Secure a funding source to implement the Kansas Aquatic Nuisance Species Management Plan through the State Water Plan Fund and through funds provided by the Expanded Lottery Act Revenues Fund (ELARF).
2. Proposal of an annual budget of \$1,626,750 be allocated to support a comprehensive ANS management program in Kansas. The funding will be evaluated annually by the Kansas Water Authority (KWA) for recommendation to the Governor. Funding at this level will provide the following:
 - a. Four FTE positions
 - i. The current ANS Program Coordinator is with the KDWPT. The coordinator position would continue with the Agency and complete program oversight would remain including a new statewide effort to conduct boat inspections at launches and as requested by the public.
 - ii. A pathologist/aquaculture specialist would be hired to address aquaculture needs, fish imports, and fish health issues.
 - iii. Two law enforcement officers would be hired to specialize in fish import inspections and ANS issues as the addition of new statutes would require more law enforcement staff be hired to address these challenges.
 - b. Temporary/seasonal employees and college students would be hired to carry out other implementation objectives and further the educational pursuits of Kansans.
 - c. Outreach activities
 - d. Boat inspections
 - e. Research

Research

1. Identify, predict, and prioritize potential ANS introductions, management alternatives for effect of ANS on native species, and facilitate the collection and dispersal of information gathered.

Coordination

1. Continue to work with federal, state, and local agencies and other groups to implement the *Kansas Aquatic Nuisance Species Management Plan*.

Legislation and Administrative Changes

1. Introduce legislation and review and administratively amend regulations to establish means of preventing the spread of ANS. Regulations to consider for changes and legislation to be introduced include:
 - a. Existing law generally prohibits the sale, possession, importation, transportation, transfer, and live release, of certain ANS species. It is proposed that a civil penalty not less than \$500 and not more than \$10,000 be established for each violation.

- b. The transport of harmful ANS may be facilitated by the movement of water and equipment from infested water bodies. To address this pathway for spread, several changes are requested. It is proposed that a civil penalty not less than \$500 and not more than \$10,000 be established for each violation.
 - i. It is proposed that all vessels being removed from a water body be required to drain all equipment holding water, bait containers, and livewells and bilges by removing the drain plug before transporting the watercraft and associated equipment on public roads and water from infested waters may not be transported on public roads.
 - ii. Further, the transport of aquatic macrophytes on any equipment should be prohibited.
- c. Currently, fish can be imported into Kansas with little oversight. A fish import permit should be required for all live fish imports.
 - i. Fish imported for resale could only be shipped to permitted pet stores, bait shops, or fish distributors.
 - ii. All permit holders would be subject to inspection for fish health and species compliance.
 - iii. Although repealed in 2006, Kansas State Statute 47-1903 established an Aquaculture Advisory Council through the Secretary of Agriculture to coordinate aquaculture activities. An Aquaculture Advisory Council may again be necessary to effectively address the issue of aquatic imports in a coordinated manner.
- d. The Kansas Department of Agriculture and the KDWPT maintain lists of species prohibited for import into Kansas.
 - i. Any species not on the approved list is prohibited but can be petitioned to be added to the approved list.
 - ii. Two lists would need to be developed; one for aquatic pets and one for aquaculture imports.
 - iii. A permit to import species not listed would need to be established for special circumstances (i.e. scientific research or zoological display specimens).
- e. All aquatic imports should be certified pathogen free according to American Fisheries Society Bluebook standards.
 - i. A list of regulated pathogens may need to be developed.
 - ii. Fish growers in Kansas would need to be certified under a special registration program.
- f. Current KDWPT regulations prohibit the transfer of baitfish between Department waters (KAR 115-8-6), yet it does not include the transfer from private waters. Anglers would no longer be allowed to transport live fish between waters of the State, thus fishing bait may be used only in the water where taken.
 - i. To aid in enforcement, anglers who transport fish must have a valid receipt from the permitted bait dealer where purchased.
 - ii. Law enforcement officers may be needed to enforce this rule. At present, the KDWPT Commission is evaluating the aforementioned recommendation.

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Upper Arkansas River Basin High Priority Issue

Salt Cedar and Other Non-Native Phreatophyte Control

January 2009

Issue

Salt cedar (Tamarisk), Russian olive and other invasive high water consuming vegetation are choking out native riparian habitat along the upper Arkansas River and other western streams in Kansas.

Description

Riparian lands in Kansas have been seriously impacted by the infestation of non-native phreatophytes. Of greatest concern are the effects tamarisk and Russian olive have on our native riparian ecosystems.^(4, 5) Tamarisk is a tenacious shrub/small tree that has a deep root system (up to 100 feet) and leaves a salt residue on the soil surface. Tamarisk, a native of southern Europe and central Asia, is classified as a deciduous shrub that rapidly attains a height of five to twenty feet and grows best in sandy soils along streams. Tamarisk was brought to the United States for ornamental purposes and most likely was first established in Kansas in the early 1900s when it was planted in windbreaks. It has been widely used for bank stabilization and windbreaks since it is well suited for the western United States. There are many different species of tamarisk that are referred to with different common names. These problematic and invasive tamarisk species are commonly referred to as salt cedar.

Tamarisk can adapt to poor subsurface water quality. Tamarisk utilizes salt to increase the osmotic potential of its deep, extensive root system, which allows it to draw water from greater depths than the native vegetation. Therefore, tamarisk tends to out-compete native obligate phreatophytes during drought periods. The salt is excreted by the leaves and is concentrated in the leaf litter, thus impeding the growth of native species where tamarisk has gained a foothold. Tamarisk uses significant quantities of water. Actual water use by tamarisk depends on several factors, water availability, climate, water quality, population density, stresses, etc. However, it has been found that tamarisk will consume more water than some native vegetation in the same setting.^(1, 2)

Russian olive, a different type of invasive phreatophyte shrub or small tree, was introduced in Kansas for windbreaks and wildlife plantings. The Russian olive, with its tendency to spread quickly, is a menace to riparian woodlands, threatening hardy native Kansas species like cottonwood and willow trees. Russian olive outcompetes native vegetation, interferes with natural plant succession and nutrient cycling, and chokes irrigation canals in Kansas.



Tamarisk flowers. Photo courtesy Kansas Water Office

The resulting invasive thickets of tamarisk and Russian olive provide poor habitat for livestock and wildlife, increase fire hazards, decrease water quality and generally use more water than native vegetation. The vegetation does, however, provide shelter protection for livestock. Infestations of phreatophytes in Kansas are roughly estimated to occupy greater than 50,000 acres.

Scientists with the U.S. Department of Agriculture (USDA) have stated that, "*tamarisk infestation has reached epidemic proportions and is one of the greatest disasters to ever befall native riparian areas in western United State*."⁽³⁾ The National Invasive Species Council has identified tamarisk as one of its primary targets for control.

Tamarisk affects the water supply in both quantity and quality. The decrease in alluvial ground water levels due to tamarisk increases the transit loss of water delivered from John Martin Reservoir in the Arkansas River. Tamarisk affects water quality by reducing in-stream flows and the concentration of naturally occurring salts in tamarisk stands.

Thick tamarisk stands promote narrowing of river and stream channels. The U. S. Army Corps of Engineers have studied the Upper Arkansas River channel capacity and documented that tamarisk is occupying space within the channel and flood zone, thus increasing the potential risk of flood damage.^(7, 8) Since tamarisk replaces native species, there is a loss of biodiversity in the infested areas. Wildfires are more intense in tamarisk infested areas, however, due to the nature of the tamarisk root crown, it recovers from fires quicker than native vegetation. Thus, fires tend to promote additional

Upper Arkansas River Basin High Priority Issue

Salt Cedar and Other Non-Native Phreatophyte Control

January 2009

infestation. Tamarisk infestation is problematic in Kansas because it negatively impacts water quantity and quality, results in the loss of land utilization options and value, as well as a loss of wildlife habitat.

Estimates of the number of acres infested in the United States are between one and two million acres. Tamarisk has been identified in nearly every county in Kansas, but is concentrated along streams and lakes in the western portion of the state. Tamarisk is prevalent along the mainstem and tributaries to the Arkansas and Cimarron rivers, as well as the shorelines of several of the state's federal reservoirs.

Helicopter surveys of the Upper Arkansas River were conducted in 2004 and 2005 by the Kansas Department of Agriculture. Estimates from these surveys indicate that more than 15,000 acres of the riparian corridor from the Colorado-Kansas state line east to the Rice County line along the Arkansas River are infested with tamarisk (Table 1). According to a statewide county survey, more than 50,000 acres of the land surveyed in Kansas are infested with tamarisk.

Table 1

County	Total Acres Tamarisk
Hamilton	5,606
Kearny	3,644
Finney	2,078
Gray	960
Ford	1,798
Edwards	989
Pawnee	492
Barton	58

Recommended Actions

1. Continue to work with agencies and groups on the water issue strategic plan and 10-Year Strategic Plan to coordinate and implement the variety of programs, research and educational efforts that are occurring or recommended.
2. Cooperate with stakeholders in Colorado to implement tamarisk control projects that cross state lines.

Recommended Actions Continued

3. Promote education on invasive plants and seek local input through the Basin Advisory Committees.
4. Continue an evaluation of the most effective and cost-efficient control measures for the Upper Arkansas River basin, and provide cost share on tamarisk control and shelter belt replacement.
5. As an effective control measure is identified for the basin, implement a wide-scale, watershed-based control effort, and combine with plans for successful beneficial vegetation that helps stabilize the soil, has potential for windbreaks and other benefits.
6. Research and evaluate biological control of tamarisk using leaf beetles and/or other suitable organisms, but pilot it with extreme caution to avoid unintended consequences.
7. Deliver educational materials and technical information to legislators, property owners and the public within the basin related to non-native phreatophyte research and control through Kansas State University Agricultural Experiment Station and Cooperative Extension Service.
8. Quantify the actual non-beneficial use of water by tamarisk in the basin's different ecological settings. Existing research should be used and augmented with on-the-ground measurements of changes to both streamflow and ground water before and after tamarisk control activities. This research will help to establish the difference in water consumption in Kansas between non-native phreatophytes and typical riparian plant communities.
9. Evaluate the recovery benefits after tamarisk control to provide valuable information on the specie's true impact to water quality, wildlife habitat, water quantity, grazing land, reduction of risk from flood damage and other features that impact the basin's ecology and economy.
10. Determine the potential value of tamarisk biomass for various value-added products such as ethanol, bedding, fiberboard, and fuel pellets, or if not suitable for alternative uses, determine how to dispose of dead plant materials.

Upper Arkansas River Basin High Priority Issue Salt Cedar and Other Non-Native Phreatophyte Control January 2009

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