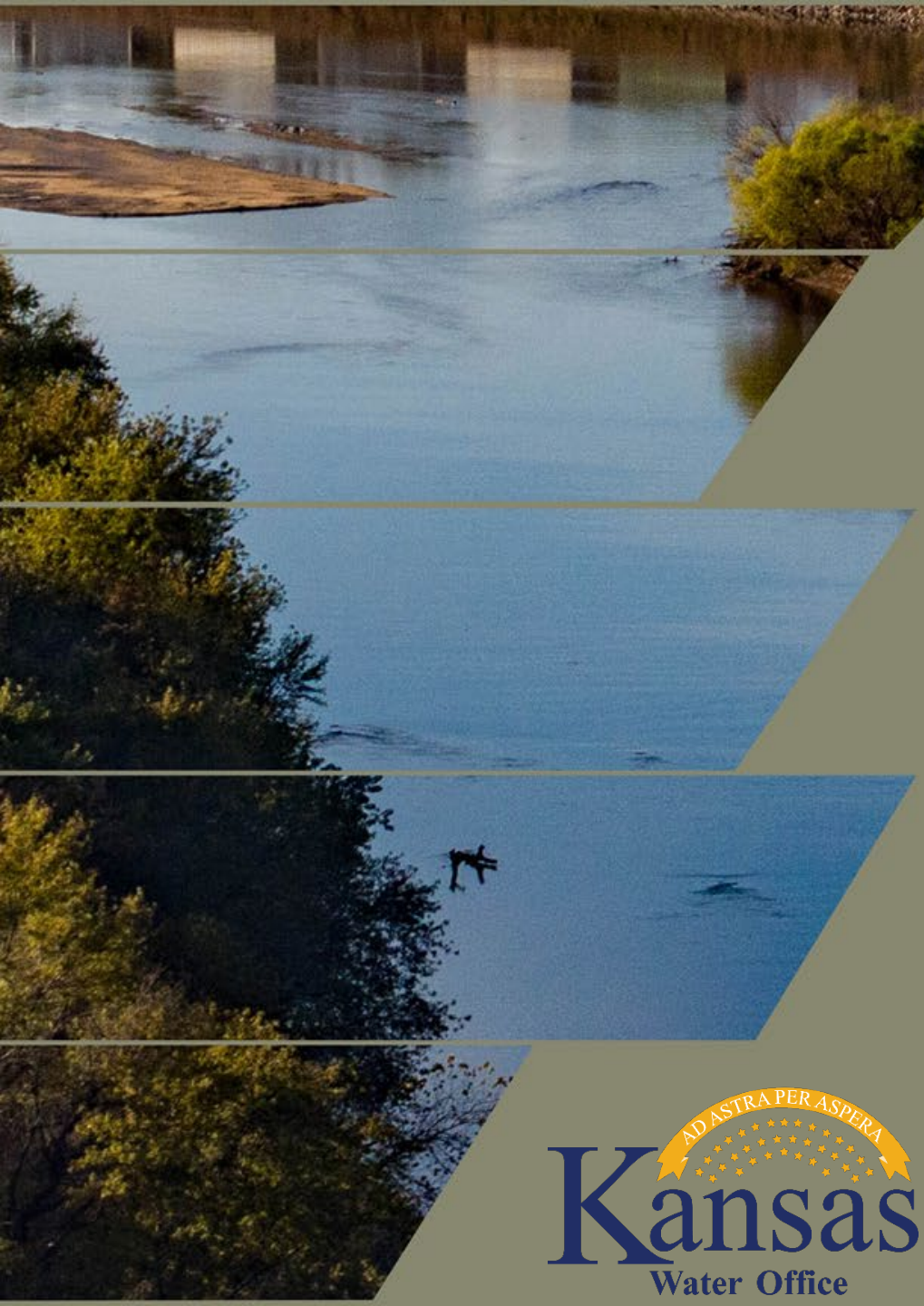


Kansas River Reservoirs Flood and Sediment Study (Watershed Study)

Smoky Hill - Saline Regional Advisory Committee

February 27, 2020

Kansas Water Office

US Army Corps of Engineers.

Kansas Department of Wildlife, Parks and Tourism

Study Background

- USACE Authorization for Watershed Study (Section 729 of WRDA 1986)
- Collaborative Federal-State Agency Effort began March 2019
- Study Result: Comprehensive and holistic long-term plan to address the multiple water resource problems

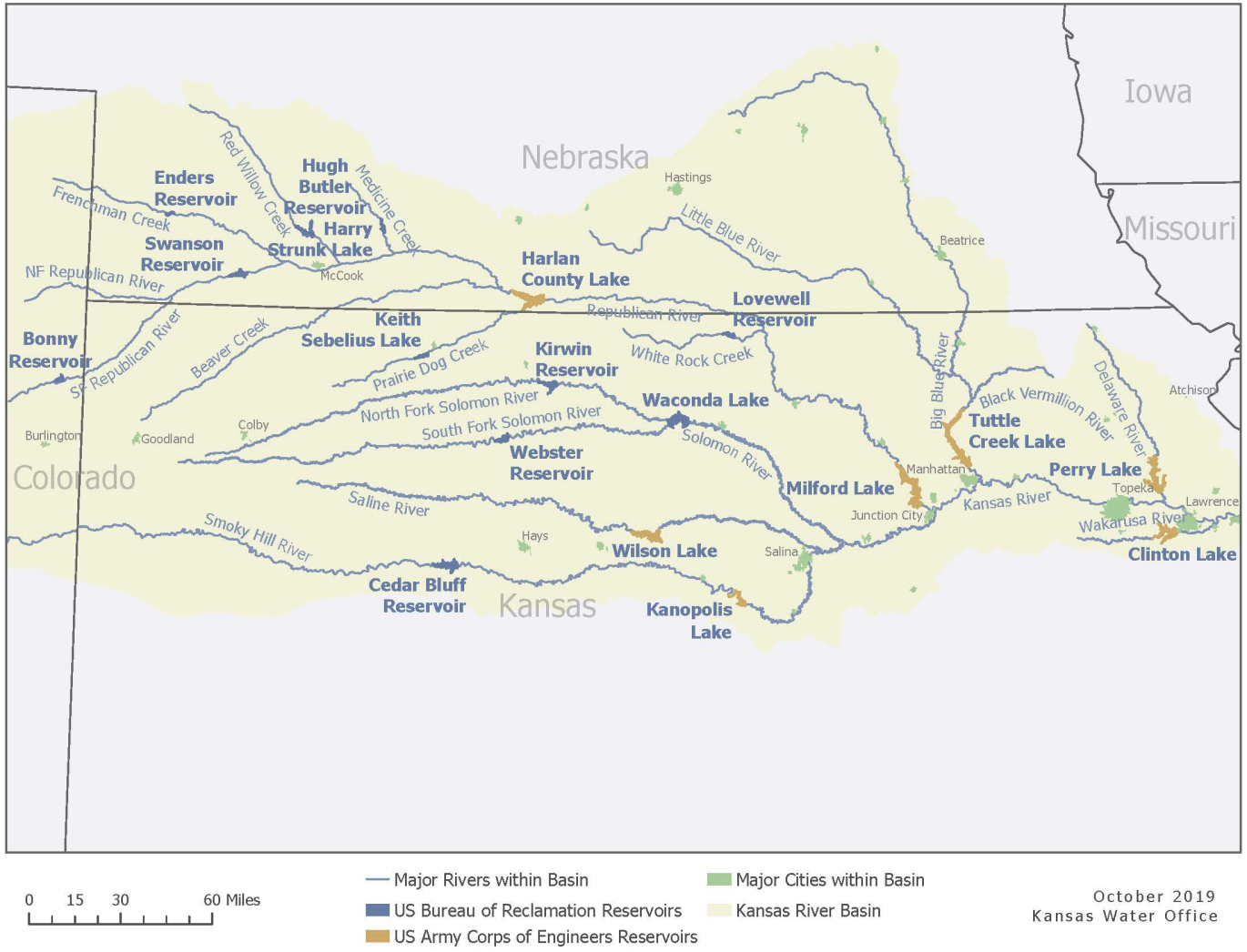
Kansas Water Office

Kansas Department of Wildlife, Parks and Tourism

US Army Corps of Engineers.

Kansas River Basin

- Drains 60,000 square miles in three states
- 18 federal reservoirs
- USACE reservoirs prevented more than $22 billion in flood damages since construction (not including 2019)
- Federal levee systems have prevented more than $2 billion in flood damages since construction (not including 2019)
- Sixty percent of KS population depends upon USACE reservoirs for water supply
- More than 3 million unique visits to USACE facilities in 2018



Anticipated Problems

- Increasing Flood Risk to Urban Areas
- Reduced Flood Storage and Water Supply Availability
- Sediment Filling Reservoirs
- Recurring Water Quality Issues including Harmful Algal Blooms
- Streambank Erosion
- Increased Demand for Recreation Opportunities
- Loss of Wetlands and Riparian Habitat

Shared Vision

- Basis for development of goals and objectives
- Identifies study area to capture impacts and influences of broadly-identified issues and opportunities
  - Flood risk management
  - Sediment loading of reservoirs
  - Reduction of flood storage and water supply availability
  - Water quality issues
  - Drought

Shared Vision

"Identify actions within the Kansas River Basin necessary to extend the useful life of our reservoirs, to increase their resiliency and maintain capacity. Develop sustainable measures to reduce flood risk, improve sediment management, and mitigate drought, while seeking opportunities related to critical infrastructure investment, water supply availability, ecosystem restoration, water quality, and enhancing recreation."

Opportunities

- Reduce flood risk, improve resiliency and increase long-term system integrity
- Increase the reliability and availability of water supply
- Manage sedimentation in reservoirs to reduce volume loss
- Reduce risks to life safety with improved flood risk system flexibility
- Improve the ecological and aquatic habitat in the Kansas River and tributaries

Study Scope

- Comprehensive and strategic evaluation of the Kansas River Basin:
  - System operating plan
  - Reservoir operations and manuals
  - Reservoir facilities and features
  - Conditions upstream and downstream of reservoirs
  - Infrastructure
  - Flood risk
  - Drought risk and preparedness
  - Ecosystem degradation
  - Water supply availability and sustainment
  - Other related needs

Tuttle Creek Dam, 30,000 cfs discharge
May 31, 2019

Study Focus Areas

- 3 primary focus areas:
  - **Flood risk management**
  - **Sediment management**
  - **Reservoir operations**

- Other Considerations:
  - Infrastructure investment
  - Water supply availability and sustainment
  - Water quality
  - Recreation
  - Ecosystem preservation and restoration

Strategies/Alternatives

- Goal: To reduce vulnerability and create resiliency of the existing system to ensure safety and to meet the needs of Kansas
- Measures considered:
  - Structural restoration
  - Sediment removal
  - Reservoir operational changes
  - Demand management
  - Reallocation
  - Extreme event (i.e. flood and drought) planning
  - Watershed management

Outreach and Public Involvement

Outreach Conducted

- Regional Advisory Committee Meetings
  - KS River RAC – September 9 and December 9
  - Solomon – Republican RAC – October 2
- Kansas Association of Conservation Districts 75th Annual Convention – November 24-26
- Kansas Farm Bureau Annual Meeting – December 2
- Small Group Workshop – December 6
- Kansas Governor’s Water Conference – December 7-8
- Public Scoping Meetings – December 2 – December 12
- Kansas Water Authority – December 19 and January 29
- Kansas Natural Resource Conference – January 30-31

Outreach and Public Involvement

Upcoming

- February 27 – Smoky Hill-Saline RAC (Agency & Commission Meeting; Scoping)
- TBD – Flood Risk Interests (Kansas Emergency Managers Monthly Meeting)
- TBD – Kansas WAD board meeting
- TBD – Recreation Briefing #1 – River Recreation (Small Group; Scoping, Existing Conditions)
- TBD – Sand Dredging Interests (Business & Industry; Existing Conditions, Initial Baseline)
- TBD – Environmental Interests/Water Quality #2 (Environmental Interests, Agencies; Existing Conditions, Small Group, Scoping)
- As Needed – Kansas Legislature Meetings/Briefings (Elected Officials; Scoping, Existing Conditions, Initial Baseline)

Outreach and Public Involvement

Study Website

https://kwo.ks.gov/projects/kansas-watershed-study

How to Comment

Comments may be sent to:

- Kansas Water Office, Attn: Josh Olson, 900 SW Jackson Street, Suite 404, Topeka, Kansas 66612
- or sent electronically by e-mail to kwo-info@kwo.ks.gov
- or submitted on the website at https://kwo.ks.gov/projects/kansas-watershed-study.

All comments submitted will become part of the official administrative record for the project.

Sediment Management and Reservoir Sustainability

- Maintenance of storage capacity is a priority
- Sedimentation causing reduced water supply storage at reservoirs (e.g., Tuttle Creek Lake)
- Consideration of new water supply sources due to aging dams and increasing Operations and Maintenance costs
- Impacts to infrastructure and recreation (e.g., marina operations)
- Importance of actions upstream in the watershed
  - Streambank stabilization, restoration of connection to floodplain, wetland protection and development, riparian forest improvement, Regional Conservation Partnership Program, timing of agricultural practices, nutrient management, improved soil health
- Monitoring of sediment amount and type being released
- Water quality issues (e.g., turbidity, HABs)
- Coordination and collaboration with surrounding states

Water Supply Drought

- Mitigating the continuous water scarcity and abundance and preparing for more extreme conditions and variability in the future
- Need for a comprehensive climate plan / improved data to better understand changes in the future
- Sedimentation causing reduced water supply storage (e.g., Tuttle Creek Lake)
  - Long-term sediment management plan to promote sustainable sediment management by analyzing alternative sediment management technologies (e.g., hydraulic dredging, hydrosuction, sediment bypass, WID) and best management practices (e.g., watershed management, streambank stabilization)

Water Supply and Drought

- Water quality issues
  - Harmful Algal Blooms
  - Stream flows
  - Reallocation of uncontracted storage at Milford and Perry
- Groundwater sources
  - Greater education and improved conservation
  - Improved water management alternatives (e.g., re-use technologies, brine sources, basin-to-basin transfers)
  - Kansas River alluvial system utilized as a filtration and storage system for water supply

Flood Risk Management

- Flooding impacts, including damage to and difficulty accessing water supply infrastructure caused by high water and debris, upstream impacts (e.g., public health and safety, economic impacts), and erosion / vegetation damage around water supply infrastructure
- Need for a comprehensive climate plan / improved data to better understand changes in the future
- Need for review of operations (i.e. releases) during flood events to reduce loss of streambanks downstream
- Review of releases/lessons learned from past floods to contribute to further study of the criteria for releases at Waverly, Missouri gage
- Lake level management plans need to account for water supply and other benefits in addition to wildlife benefits. Winter releases that are large are a concern and there is a desire for more balanced releases (e.g., winter releases later in the year).

Flood Risk Management

- Better communication with the public during flood events, particularly in urban areas, and real-time decision making ability needed (e.g., real-time flood inundation mapping and enhanced streamflow monitoring) to allow communities more time to prepare.
- Preservation and restoration of floodplain was discussed as a valuable strategy to reduce flood damages. However, economic conflicts were noted.
- Development of urban planning and zoning in the floodplain was noted as an issue related to damages incurred. Mandatory flood insurance in these areas was suggested to help manage this risk.
- New infrastructure needs (e.g., levees) to improve protection. New levees could have recreational opportunities as well (e.g., trails and parks).
- Best management practices to reduce flood risk through upstream practices that improve infiltration (e.g., increased riparian cover and improved soil health). USACE lands above reservoirs not currently using BMPs (i.e. agriculture leases).

Ecosystem Restoration and Management

- Goal to create a healthy, resilient system, preserving rather than rehabilitating
- Describing baseline conditions for altered and changing system
- Invasive species management and effects on threatened and endangered species
- Consideration of impacts to fish species from changed flow conditions and current flow regime
- Reallocation of multipurpose pool for water quality at Perry and Milford
- Creating a minimum desirable streamflow for the Kansas River
- Opportunities to reconnect the floodplain, restore riparian forests, restoration / development of wetlands, increase turbidity for native species, address channelization related to agriculture. Legislation could be considered (e.g., buffer law).
- Impacts to lake shoreline vegetation during high lake levels
- Impacts of HABs to the ecology
- Any actions should consider Operations and Maintenance costs and the potential need to compensate landowners

Recreation

- Any proposed changes to reservoir operations should consider impacts to recreation users
- Flooding and drought both negatively impact wildlife and limit recreational access and use. Local businesses experience reduced profits and state parks lose revenue from reduced visitation, damaged infrastructure, and increased operating costs
- Maintaining more consistent lake levels would better allow for recreational infrastructure to be built, improve the effectiveness of shoreline stabilization efforts, and help with habitat management and spawning issues
- Land management issues related to recreation
  - Purchase of eroding lands to stabilize and convert to recreational use that could also benefit wildlife
  - Reduction of nutrient runoff to improve water quality
- Need improved public education and communications related to:
  - Recreational opportunities in the Kansas River Basin
  - Improved timeliness of communications to recreational users, especially during flood years when conditions could change rapidly
  - HABs awareness and education related to the threats to human and animal health

Study Outcomes

- Recommendations for actions to address identified problems
- Broad implications for decision makers
- Strategic roadmap/planning document that identifies the sequencing of priorities
  - The screening of measures in the final report will help identify these priorities
  - Will note where federal authorities and appropriations are available OR where new ones are needed
- Presents the findings and recommendations for future efforts, including potential future projects and studies both near-term and long-term
  - Must be federal, state AND local effort
- The KRRFSS will not directly initiate a project (e.g., approval for sediment removal, or authority for levee construction, etc.)

Schedule

- May – September 2019: Project Management Plan Development
- July 2019 – June 2020: Initial Baseline and Existing Conditions, Future Conditions, Measures/Strategies/Alternatives Development
- September 2019 – January 2020: Initial Round of Stakeholder Coordination and Public Scoping
- June 2020 – July 2020: Preparation of Study Summary Document
- November 2020: Shared Vision Milestone Meeting
- December 2020 – May 2023: Watershed Study Recommendations Milestone
- Fall 2023 – Final Watershed Study Report