Kansas River Reservoirs Flood and Sediment Study (Watershed Study)

Kansas RAC

29 October, 2020

Kansas Water Office

US Army Corps of Engineers.

Kansas Department of Wildlife, Parks and Tourism

Accomplishments

- Extensive stakeholder and public outreach
  - Small group workshop with over 40 participants from various interests
  - Regular communications with the Kansas Water Authority and the Regional Advisory Committees
  - Study Advisory Committee
  - Focused interest group discussions – Flood risk managers, water supply, recreation, environmental
  - 4 public involvement meetings
- Development of framework to perform comprehensive assessment of existing conditions and expected future conditions to enable development of a strategic roadmap to inform future investment decisions by multiple parties and to better account for uncertainty
- Acquisition and analysis of comprehensive datasets and information related to hydrologic conditions, hydraulics, sediment transport, economic data, water supply demand and uses, recreation benefits, biological resources, cultural resources
- Identification of a spin-off study for Tuttle Creek Lake Long-term Sediment Management Plan
  - Technical Report for Existing Conditions and FWOP complete to support study need

Study Scope

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

Study Scope

- The study will focus on 3 primary focus areas:
  - Flood risk management
  - Sediment management
  - Reservoir operations
    - e.g. Conditions (drought and sediment) that influence storage in the various pools and affect the ability to meet downstream flow requirements for water supply and water quality
- Also looking at opportunities related to:
  - Infrastructure investment
  - Water supply availability and sustainment
  - Water quality
  - Recreation
  - Ecosystem preservation and restoration

Opportunities

Opportunities exist to:

- Reduce flood risk in the study area, improving system resiliency and increasing the long-term integrity of the flood system
- Increase the reliability and availability of water supply
- Manage sedimentation in reservoirs to reduce loss of volume and decrease the sedimentation rates for sustainment of authorized purposes and benefits
- Reduce risks to life safety in the Kansas River Basin with a focus on improved flood risk system flexibility under a variety of climate change and land use development patterns
- Improve the natural dynamic hydrologic and geomorphic processes in the Kansas River and its tributaries

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."

Goals and Objectives

Draft Goals

The specific goal of this study is to assist in developing a comprehensive basin-wide management plan that will:

- Incorporate public input and involvement
- Assess existing watershed characteristics and conditions
- Identify watershed issues and concerns
- Develop, evaluate, and prioritize conceptual plans including both structural and non-structural measures, in support of identified goals and objectives
- Identify potential “spin-off” and “off-shoot” projects that may fall under appropriate Federal, State, and/or local authorities, and
- Identify potential regional or locally funded projects.

Outreach and Public Involvement

Upcoming

- Stakeholder Outreach
  - Kansas Water Authority (Regular briefings)
  - Regional Advisory Committees (Regular briefings)
  - Continue Coordination With Stakeholder Groups
- Small Group Workshops
  - Measures/Strategies/Alternatives
  - Recommendations
- Public Meetings
  - Recommendations Milestone
  - Draft Watershed Study Report
- Kansas Legislature Meetings/Briefings (Elected Officials; Scoping, Existing Conditions, Initial Baseline)
- Outreach Support Contract

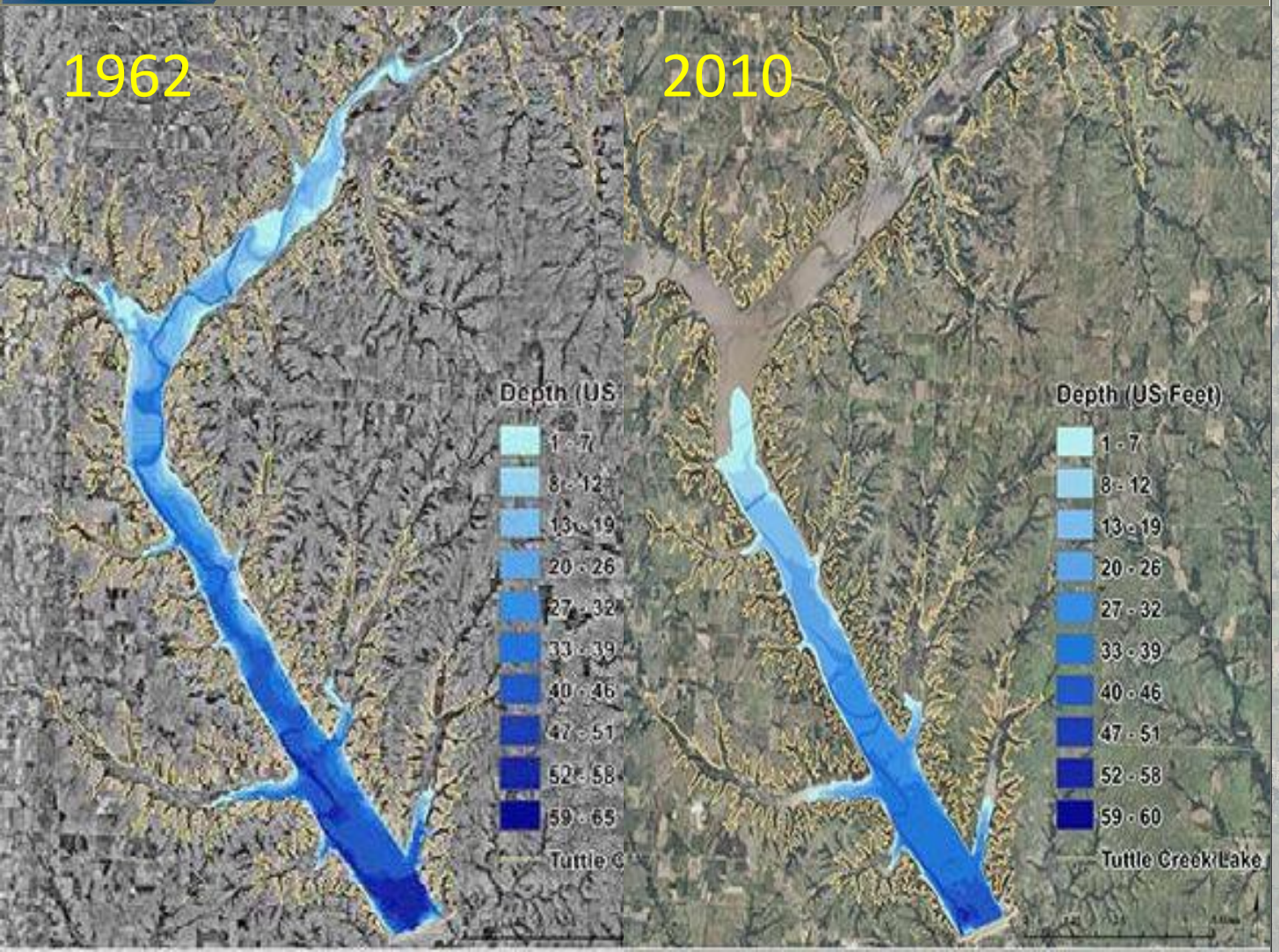
Strategies/Alternatives

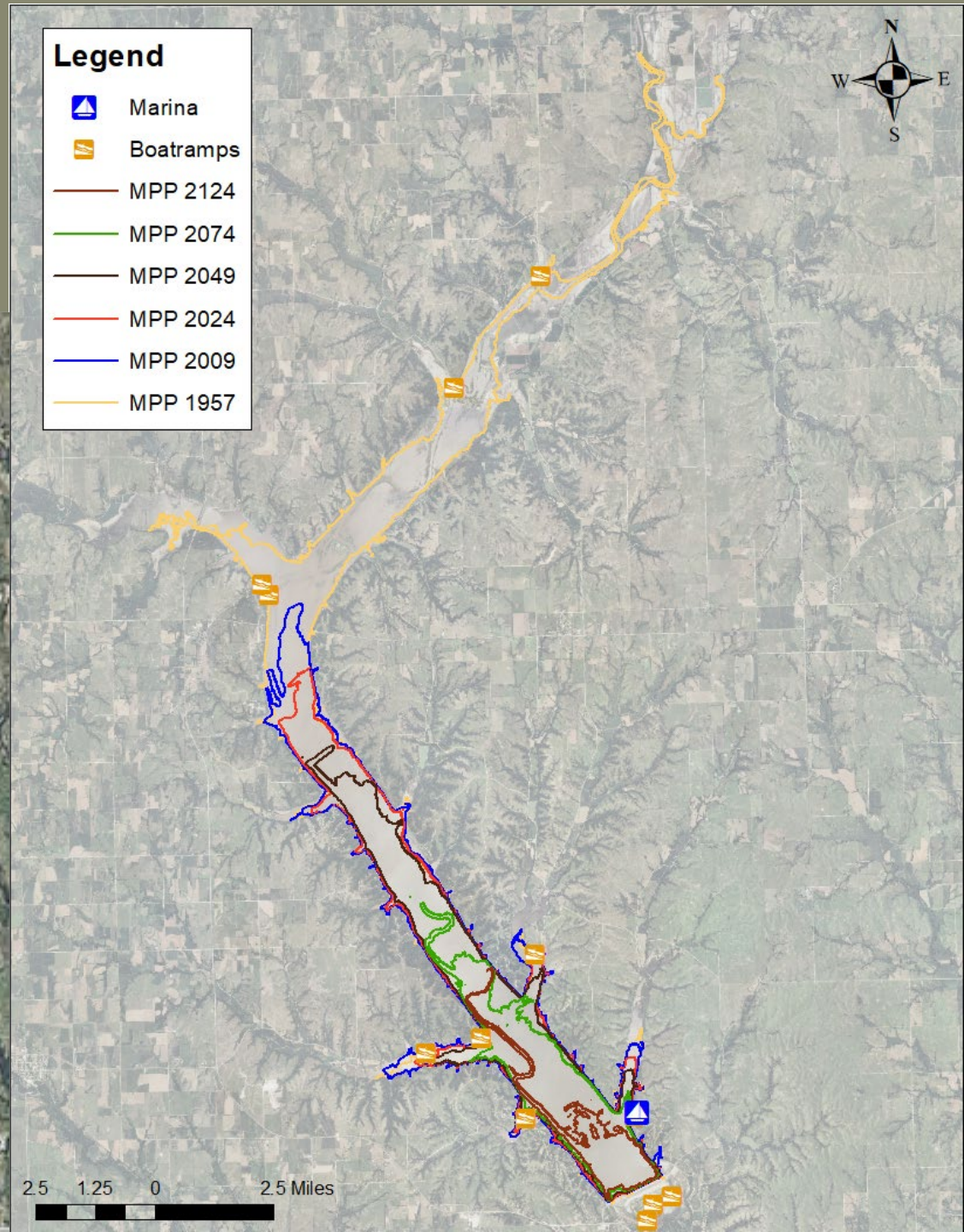
- Strategies/alternatives considered would include those necessary to reduce vulnerability and create resiliency of the existing system to ensure safety of communities and to meet the needs of Kansas
- Potential measures to considered include:
  - Extreme event (i.e. flooding and drought) planning
  - Sediment management (traditional techniques and innovative technologies)
  - Structural restoration (e.g., repair, replacement, and rehabilitation; investments in flood risk management infrastructure; capital investment)
  - Reservoir operational changes (e.g., water control manual update)
  - Demand management (i.e. managing to meet future projected water supply and/or environmental demand)
  - Reallocation of storage
  - Watershed management (e.g., watershed stabilization through bank stabilization and grade controls; non-structural flood risk measures; ecosystem restoration)

Sediment Management

- Hydrosuction Dredging with Downstream Discharge
- Water injection dredging
- In-Lake Hydraulic Dredging
- Watershed stabilization (grade control and bank stabilization/stabilize headcuts)
- Drawdown flushing (Tuttle Creek Lake)
- Repurpose upper reservoir areas to capture sediment/Sediment mining

Projection of Multipurpose Pool at Tuttle Creek Lake





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Tuttle Creek Lake Long-Term Sediment Management Plan

- Tuttle Creek Lake is the largest reservoir in Kansas possessing more flood control, water supply, and navigation support than the other six reservoirs in the basin combined.
- Over 40% of the population in Kansas depend on the flood control and water supply benefits of Tuttle Creek Lake (prevented over $12.4 billion in damages over the life of the reservoir).
- Estimated that approximately 39% of the multipurpose pool and 4% of the flood control pool is currently lost to sediment.
- Without intentional action, the benefits of this crucial and irreplaceable resource will continue to diminish.

Water Supply

- Sediment management measures and strategies
- Comprehensive Climate Plan/Extreme Event Planning/Drought Resiliency Plan
- Utilization of KS River alluvial system as a filtration and storage system
- Continuation of KS River Alluvium groundwater model development
- Basin to basin transfers
- Changes to reservoir operations/existing purposes (e.g., reallocation, removal of navigation releases, modification of low flow target values to extend period of low flow support)

Water Quality

- Upper watershed BMPs (e.g., streambank stabilization, improved soil health, increased riparian vegetation and forested wetlands/oxbows, cover crops, no till farming practices)
- Operation of Milford, Perry, and Tuttle as a system to maintain water quality issues and appropriate stream flows
- Repurposing of water supply to water quality (e.g., Milford and Perry)
- Operational strategies for Harmful Algae Blooms (HABs)
- HABs treatment

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
- **One Spin-Off already identified: Long-term Sediment Management Plan for Tuttle Creek Lake**
- The KRRFSS will not directly initiate a project (e.g., approval for sediment removal, or authority for levee construction, etc.)

Study Schedule

Shared Vision Milestone

- May 1 – September 13, 2019 – PMP Development and Approval (to include a communications plan)
- May 1, 2019 – May 22, 2020 – Review Plan Development and Approval
- July 2019 – January 2021 – Initial Baseline and Existing Conditions
- September 2019 – January 2020 – Initial Round of Stakeholder Coordination and Public Outreach Meetings
- October 2019 – March 2021 – Identify and Screen Conceptual Measures/Alternatives
- June 2020 – April 2021 – Preparation of Study Summary Document
- May 2021 – Shared Vision Milestone Meeting (Original Date – 27 November 2020)

Recommendations Milestone

- May 2021 – May 2023 – Watershed Study Recommendations
- May 2023 – Recommendations Milestone Meeting

Final Watershed Study Report

- June 2023 – December 2023 – Final Watershed Study Report Preparation
- Fall 2023 – Final Watershed Study Report Milestone Meeting

Small Group Workshop Measure/Strategies/Conceptual Alternatives Brainstorming

- **Late Fall/Early Winter 2020**
- **Goals/Purpose**
  - To gather and exchange information and to hear specific ideas from a group of diverse interests and stakeholders across the Kansas River Basin
  - To ensure that the values of stakeholders and the public are incorporated into the Watershed Study
- **Desired Outcomes**
  - Identification of measures/strategies to address issues and problems related to water supply and drought, sediment management and reservoir sustainability, flood risk management, ecosystem restoration management, recreation and “why” they are important

Questions to Consider

- **What measures/actions would you take to address issues related to:**
  - Water Supply and Drought
  - Sediment Management and Reservoir Sustainability
  - Flood Risk Management
  - Ecosystem Restoration and Management
  - Recreation

Questions?