Sustainable Rivers Program

Coordination and Outreach Efforts
Kansas River Environmental Flows:
Summary of meetings and engagement

November 2018

Compiled by Kansas City District, U.S. Army Corps of Engineers

601 E. 12th Street, Kansas City, MO 64106

Prepared for U.S. Army Corps of Engineers

and other cooperating organizations

CENWK-PM-PF November 29, 2018

MEETING SUMMARY

SUBJECT: Sustainable Rivers Program – Steering Committee Annual Update
LOCATION: Westar Professional Training Center, Topeka, KS
PRESENTERS: Heidi Mehl (TNC); Cristina Ostrander (USACE); Paul Simon (USACE); Don Huggins (KBS); TJ (KWO)

Attendees included the SRP core team and program Steering Committee members that consists of key external partners who are engaged in the SRP including Friends of the KAW, Kansas Alliance of Wetlands and Streams, Kansas Water Office (KWO), US Geological Survey (USGS), Kansas Biological Survey (KBS), Kansas Department of Health and Environment (KDHE), Kansas Department of Wildlife, Parks, and Tourism (KDWPT), Kansas Forest Service (KFS), Kansas Geological Survey (KGS), Kansas Regional Advisory Committee (Kansas RAC), Kansas Water Assurance District, Kansas Water Authority (KWA), KDA Division of Conservation, KDA Division of Water Resources, K-State, Kansas Aggregate Producers Association, USEPA, and USFWS. Other advisors and stakeholders were also in attendance (Sign-in sheet and agenda attached).

1. Welcome and Introductions

2. Review of Year 2 (2018) Objectives and Team Charter (Heidi Mehl [TNC] and Christy Ostrander [USACE])

The committee reviewed the Sustainable Rivers Program (SRP) mission and project goals and the team charter to convene key personnel and partners to provide strong scientific and stakeholder support for the SRP commitment to improving ecological flows and reservoir health in the Kansas River System.

The discussion included a review of the personnel and partners that are core team members, steering committee members, advisors, stakeholders, and the technical team for the SRP and the role of each group. The Team Charter was updated in Year 2 (TNC provided a handout with the most recent Team Charter).

The basic process that will be implemented for the SRP includes initiation, defining e-flows, implementing e-flows, and incorporating e-flows.

Year 2 Objectives:

- Task 1 – Analysis of flow data and evaluation of the Regime Prescription Tool (RPT) by the USACE

- Task 2 – Contract established for ecological literature review and synthesis

- Task 3 – Compilation of historic flows, water quality, and sediment data by the USGS

- Task 4 – Steering committee meeting and stakeholder outreach to identify any operational constraints or concerns

3. Regime Prescription Tool (Paul Simon [USACE])

The USACE gave a presentation of the RPT using the Des River SRP example that included flow components and targets beneficial to plant and animal species and their habitats. The RPT is a visualization tool of flow data that is primarily designed for use at workshops. Potential flows can be used in the RPT to graphically depict potential outcomes.

The parameters of the RPT include Systems/States/Flow Components. Systems are the river reach or reservoir of interest. The RPT primarily looks at flow data, however, the Des Moines example applied to a reservoir as well. States are flows that could occur in wet/average/dry years. Flow components are target flows beneficial to species and their habitats that looks at the minimum and maximum flows beneficial to species and the timeframe (i.e. duration of days) the flows are needed. Flow component examples for the Des Moines SRP included a summer rise for fish spawning and rearing, flows for the early season spawning, fall foraging for fish, and spring recruitment maintenance.

Environmental flow-plan proposals (i.e., e-flows plans) for the Kansas River SRP can be developed for different locations, species, and conditions. Multiple e-flows plans can be developed for various targets and the desired condition and then from the suite of e-flows plans perform a screening to determine the constraints what could be feasible considering the needs and requirements of stakeholders. These e-flow plans would be developed within the constraints of authorized purposes of the reservoirs, water rights, and other human use requirements, and in collaboration with stakeholders.

The number and type of e-flow plans will be determined through discussions with the core team, steering committee, advisors, stakeholders, and technical team and through information in the ecological literature review and synthesis. E-flows plans could focus on the biological/functional needs or life history requirements of species guilds and/or habitats (e.g., riparian cottonwood forests, sandbar nesting species, pelagic spawners).

The upcoming e-flows workshop will be built on a base of information. Water budgets could be prepared to see how e-flows would affect stream flows and reservoir elevations. The Kansas River is a complicated linear system with reservoirs so water budgeting would be important. One method could be to break the river into multiple reaches and set flow targets for each reach (e.g., Milford Reservoir to Tuttle Reservoir, Tuttle Reservoir to the confluence of the Kansas River and the Missouri River).

4. Ecological Data Synthesis (Don Huggins [KBS])

Data synthesis is currently ongoing. The ecological literature review looked at data for the Kansas River and to date primarily includes fish data with some mussel data. Mussel

data is limited with some historic data and a substantial amount from 1990-2000's. Most of the mussel species historically documented have been lost from the Kansas River with approximately 50 percent from the watershed and 70-80 percent from the river. The Kansas River differs from the Des Moines River example in that the Des Moines River occurs in a climatic region that has a fairly consistent precipitation regime compared to the Kansas River. The precipitation regime in the region where the Kansas River occurs has greater swings in temperatures and precipitation annually and across multiple years compared to the region (i.e. Great Plains) where the Des Moines River occurs. Additionally, the climatic conditions differ from the west to east side of the Kansas River basin with the reservoirs on the east side of the basin functioning differently that on the west side.

The KBS has worked to organize the data for the Kansas River into one common format in an effort to reconcile the data in order to make comparisons between data sets from different years. The data was compiled into segments. This data could be looked at to identify changes that have occurred to species or species guilds due to reservoir management on the Kansas River system. The segment where the Bowersock Dam occurs from the dam to the confluence of the Kansas River with the Wakarusa River was excluded because it was considered a major impediment to immigration and emigration.

The KBS looked at the timeframes (i.e., range of years) that could be used to synthesize and evaluate the ecological data. Gido et al. 2010 looked at land use changes related to flow changes. Gido and Liechti looked at change in the Kansas River basin for periods of 1947-1964 and 1991-2003. The Kansas River SRP could look at the period before and after construction of the dams. The dams were constructed from approximately 1940's-1960's. Segment 3 seems to provide the most robust data set.

The KBS presented some of the trends they see in the data set. However, it is hard to tease out specific causes as multiple changes occurred within the same timeframe such as reservoir construction, land use changes, and changes in the temperature and precipitation regime. Land use changes occurred quickly starting in the 1800's. Invasive species will be looked at as well.

Meeting participants asked that maintenance of more even flows should be looked at as well as the peaks in flow to determine if there are any ecological benefits of the more even flows. The channel geometry has changed over time which has been documented. Current flows combined with current channel geometry could differ from historically flows associated with a particular channel geometry.

It is expected that e-flow plans would be developed within the constraints of reservoir operating plans. This may not require a larger study to implement, however, if any were developed outside of these constraints a larger study would be required. One example could be an e-flow plan that would enhance aquatic habitat complexity in the reach downstream of Bowersock Dam.

5. Stakeholder Workshops Summary and Outcomes (Heidi Mehl [TNC])

Workshops were conducted to inform identified stakeholder groups about the project and to learn what information these stakeholders think is important on the river. Stakeholder workshops were conducted with five broad groups and included workshops focused on environmental, recreation, municipal and business interests, operational (i.e. dams, public lands), and agriculture. Outcomes include a list of items that participants would like to see considered. The list includes:

- better balancing of reservoirs
- sport fisheries
- protection of native species
- invasive species
- slower drawdowns at reservoirs
- reconnection of side channels/tributaries
- more flexibility in water management
- better coordination between all interests to take advantage of certain situations
- different plans for wet/dry years
- more wildlife monitoring
- analysis of impacts to upstream lands
- analysis of impacts to sandbar habitat
- cottonwood forest trends

A request was also made to consider changing the name of environmental flow plan proposals from e-flows to something else. Some considerations could be beneficial flows (b-flows) or collaborative flows (c-flows).

General comments heard include:

- concerns related to Kansas River management based on the gage at Waverly
- water quality concerns form municipalities related to nutrients and sediments
- valence water out of reservoirs (blending of flows to benefit species and water quality)
- no concerns were identified related to agriculture
- KDHE should provide more outreach to notify recreation users of sewage spills and harmful algal blooms

6. Milford RCPP (TJ [KWO])

The KWO gave a summary of the RCPP and workshops related to this conducted to date.

7. Proposal Development for 2019

SRP actions for 2019 would include:

- The core team will be working to identify data need for the e-flow workshop tentatively planned for fall 2019 (September-October).

- The USACE is updating the 2009 Geomorphical Assessment Report for the Kansas River.

- The ecological literature review and synthesis will continue and the USGS will work on compiling water quality and flow data. Two additional technical team meetings will be held to review results and determine if additional information is needed and how to present the data.

- Monitoring and evaluation needs include USGS flow gage data.

- Facilitation should occur between the ecological and flow work. Data needs include identification of risks and impacts both to biological resources and the human environment.

- Economic analysis is needed to determine impacts if any and/or benefits.

- Field trip is tentatively planned for the steering committee to the Des Moines River SRP for July 23-25. Likely a 1-2 day trip but the core team will continue to plan and update the steering committee.

- Continued stakeholder outreach

8. Goal Setting for e-flows Workshop

The USACE will conduct facilitator training of the RPT tool prior to the e-flows workshop.

The workshop will likely consist of smaller breakout groups to discuss various e-flow plans that will report back to the larger group. Invitations will be sent out to stakeholders of the Team Charter.

CENWK-PM-PF November 1, 2018

MEETING SUMMARY

SUBJECT: Sustainable Rivers Program – Stakeholder Outreach
LOCATION: Kansas Department of Agriculture, Manhattan, Kansas
PRESENTERS: Heidi Mehl (TNC); Cristina Ostrander (USACE)

Attendees included interested parties from the Kansas Water Office, Kansas Forestry Service, Kansas Department of Agriculture, Kansas Department of Wildlife, Parks, and Tourism (Sign-in sheet attached).

A presentation was given by the Nature Conservancy (TNC) and the U.S. Army Corps of Engineers (USACE) to a group of stakeholders with a focus on agricultural interests. The presentation provided an overview of the purpose and history of the Sustainable Rivers Program (SRP) and the addition of the Kansas River to the program.

The presentation also outlined next steps in the process including the collection and synthesis of literature pertaining to the Kansas River basin and the development of environmental flow plans (e-flows). Development of e-flows will be done using a Regime Prescription Tool (RPT) developed by the USACE to inform future research and partnerships on the Kansas River. An e-flow workshop is planned for summer 2019.

Part of the process will also identify gaps in the data that could be addressed through future research. Examples were presented for projects completed or under development on the Roanoke River and the Des Moines River.

Constraints include project purposes (i.e. USACE owned and operated reservoirs), water rights, and flow targets. The gage at Waverly regulates flow targets and release criteria. The program includes looking for areas where there is flexibility in operating requirements/targets where changes could be made that would influence aquatic resources. Flow targets set at Waverly are dictated by the Missouri River Master Manual and each reservoir has a specific Water Control Plan.

Group Discussion: The Kansas Water Office reported that they have contacted marina operators at Clinton, Perry, Milford, and Tuttle reservoirs. Marina operators at Clinton and Perry are satisfied with the current lake levels and have no concerns. Milford and Tuttle marina operators have not responded. Marina operators could be invited to workshops and data points could be collected from them when they have issues.

Milford Reservoir is currently 10 feet above and they are currently unable to release. Updates on potential releases are sent to a constituent's email list. Updates could also be sent from the SRP.

Irrigation on the Kansas River has not been a viable activity due to streambank erosion and movement of the river that could potentially damage equipment or cause equipment to become inaccessible.

Milford Lake has water reservation rights. Softening adjustments with releases could be made that would reduce stream bank erosion. There was brief discussion regarding potential impacts to irrigators along the Republican River upstream, but after discussion this does not appear to be a concern that would be realized. Any SRP recommendations would need to be evaluated to confirm there is no impact and coordinated with KWO and DWR.

Impact to lands upstream on lands where the Corps has flood easements and/or if new easements would need to be acquired was mentioned as something to consider in the evaluation of SRP recommendations on in-lake impacts.

The Kansas Forestry Service would be interested in measures to increase cover by cottonwood as forests dominated by cottonwood have decreased in Kansas by approximately 60% compared to historical cover. They are working on methods to map the extent of current cottonwood forests.

Issues with sediment in Tuttle were expressed. The Kansas Water Office referenced the Water Injection Dredging project that is studying a potential solution to balancing sediment coming in and leaving Tuttle.

The presenters asked if there were any concerns related to agriculture and the SRP. Attendees did not currently know if any that needed discussion.

Presentation follows.

Sustainable Rivers Program

Kansas Alliance for Wetlands & Streams
KAWS

Friends of the Kaw

KU KANSAS BIOLOGICAL SURVEY
The University of Kansas

USGS
science for a changing world

Kansas
Water Office

Sustainable Rivers: Quick Refresh

The Sustainable Rivers Program (SRP), is a collaborative effort between the Corps and The Nature Conservancy (TNC).

Mission: Identify opportunities to adjust dam operations to improve the heath and life of rivers, while improving or not adversely affecting project purposes and human benefits of reservoirs and the river.

Project Goals are accomplished through a cooperative, collaborative process, culminating in the e-flow workshop.

Sustainable Rivers Program

Basic Process*	Example Tasks
1. Initiate	• Engage Stakeholders • Orientation Meeting
2. Define e-flows	• Literature search • Synthesize available river specific and regional information
3. Implement e-flows	• Modeling • Stakeholder engagement via workshop • Testing • Monitoring
4. Incorporate e-flows	• Adopting operational changes • Policy update with periodic review • Monitoring

*cooperative/collaborative process that leverages stakeholder capabilities

Year 2 Objectives

- Task 1: USACE analyzed flow data and evaluated the RPT tool
- Task 2: Established a contract with KBS for ecological literature review and synthesis
- Task 3: TNC led communications and stakeholder outreach, including identification of operational constraints

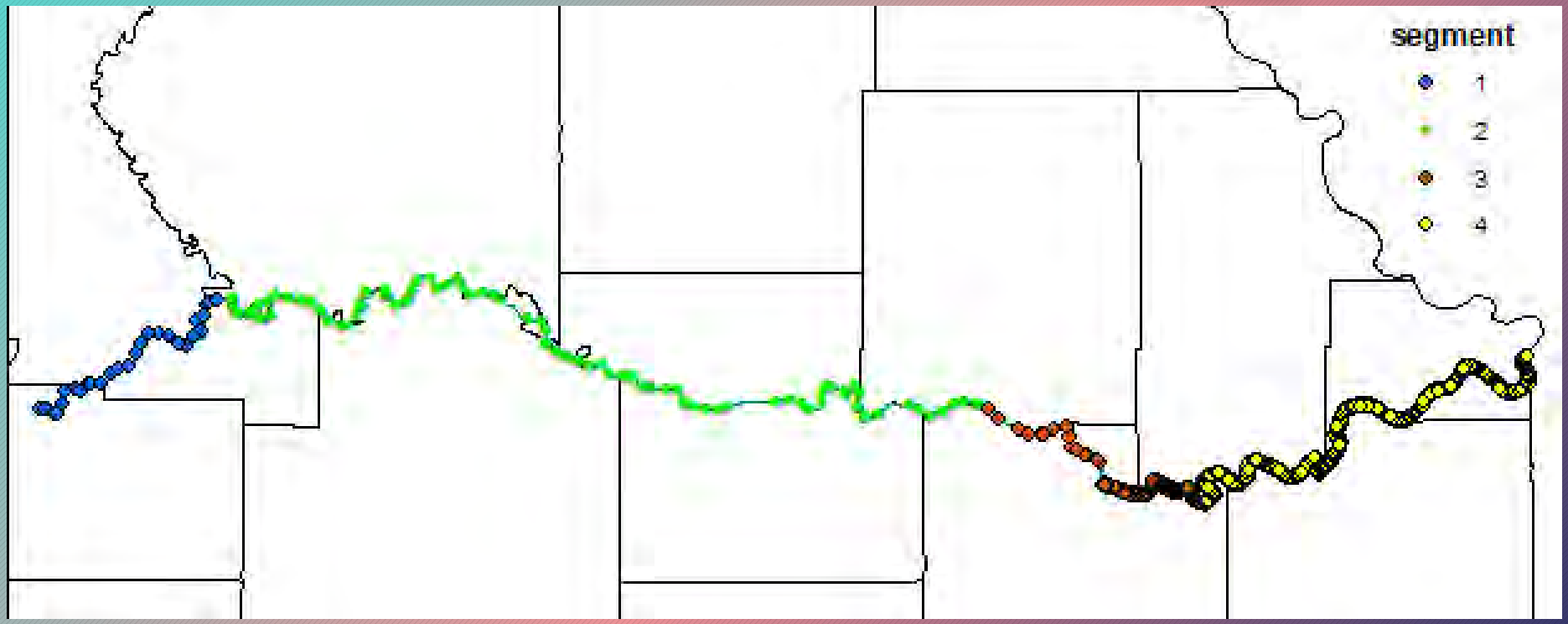
KBS Ecological Literature review

- Goals:
- 1. To examine changes in species abundance before and after reservoir construction
- 2. To summarize flow requirements of native species
- 3. To identify gaps in the available data

KBS Ecological Literature review

- Formed a Technical Team to provide critical input
- Species included:
  - Fish
  - Mussels
  - Sandbar-nesting birds and other river-associated bird species (ie. Bald Eagles)
    - Riparian vegetation (cottonwoods)
    - Insects
    - Reptiles & Amphibians
- 2018 work focused on fish
- 2019 work will be finalized on remaining species

By segment



Some trends

- From summaries for previous data meetings, using a blend of Gido et al. 2010 & Liechti IBI, we see changes in the Kansas River Basin between 1947-1964 and 1991 – 2003 for:
- Decreases in
  - # Round Bodied Catostomid Sp. (e.g. suckers)
  - % simple lithophils (fish preferring gravel size substrates)
  - sensitive species (species noted to be sensitive to environmental change and pollution)
- Increases in % Omnivores

In addition to habitat needs of native fish, changes in stocked or introduced fish are highlighted in excel file

Have stocking info 1970s to present for 9 reservoirs:

- **Cedar Bluff**
- **Glen Elder**
- **Kanopolis**
- **Kirwin**
- **Wilson**
- **Milford**
- **Tuttle**
- **Perry**
- **Clinton**

<u>Decreased pre-1964 to post-2003</u>

- **White crappie**
- **Largemouth bass**

<u>No noted change</u>

- **Gizzard shad, Redear sunfish**
- **Goldfish, Walleye, small m bass**
- **Striped bass, Wiper, paddlefish**
- **Emerald Shiner**

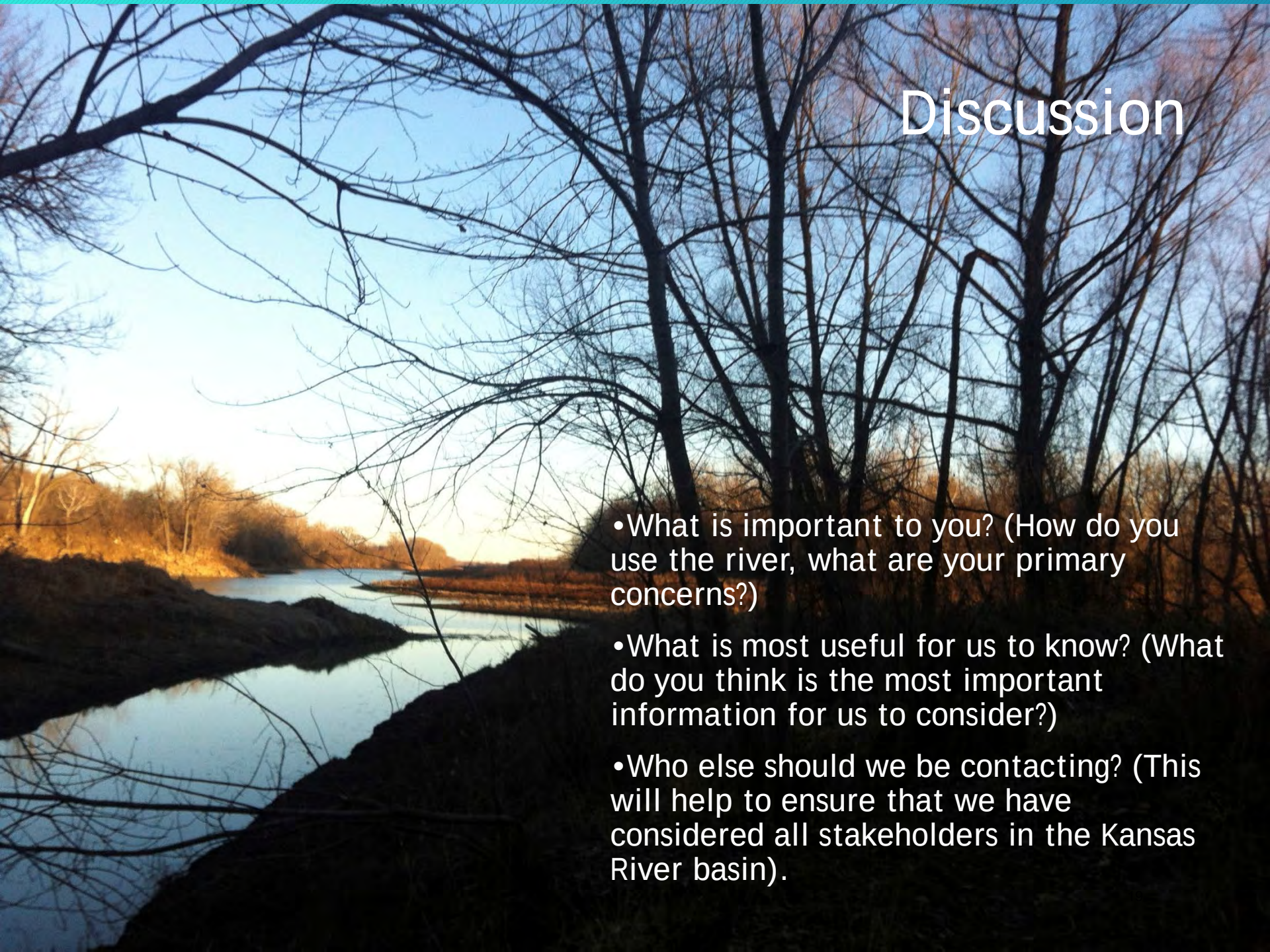
<u>Increased</u>

- **Blue catfish**
- **Channel catfish**

Stakeholder Workshops

- Developed Communication Plan
- Broke stakeholder list into five broad groups

Date	Interest group
Tuesday, August 21st	Environmental interests
Thursday, September 6th	Recreational interests
Wednesday, September 26th	Municipal and business interests
Tuesday, October 2nd	Operational interests
Thursday, November 1st	Agricultural interests



Discussion

- What is important to you? (How do you use the river, what are your primary concerns?)
- What is most useful for us to know? (What do you think is the most important information for us to consider?)
- Who else should we be contacting? (This will help to ensure that we have considered all stakeholders in the Kansas River basin).

Outcomes

- Stakeholders would like to see:
  - Better balancing of reservoirs/sport fisheries with water for river users
  - Protection of native species (fish, mussels, sandbar nesting birds)
  - Could the flow plan disadvantage invasive species?
  - Slower drawdowns (heard from environmental, recreational, and business interests)
  - Reconnection of side channels and tributaries
  - More flexibility in water management AND better coordination between all the players to take advantage of certain situations

Outcomes

- Stakeholders would like to see (cont.):
  - Different plans for wet/dry years
  - More wildlife data/monitoring
  - An analysis/consideration of impact to upstream lands/wildlife & waterfowl management/public lands
  - Evaluation of impacts of flow plan to sandbar habitat (maybe sandbar inundation modeling)
  - KFS would like to monitor Cottonwood forest trends

Outcomes

- Stakeholders expressed:
  - Concerns about how much of our management hinges on management in the Missouri (Waverly)
  - Water quality concerns from municipalities
  - Private interests want to be part of the process
  - Currently no perceived impacts to ag
  - Any SRP recommendations would need to be evaluated to confirm there is no impact and coordinated with KWO and DWR.
  - Could KDHE provide more outreach for to notify recreational users of sewage spills and HABS?

2019 Proposal and Work Plan

- Ecological literature review and synthesis will continue (KBS and technical team). Final report prepared in advance of e-flow workshop
- USGS technical support on water quality and flow data
- The Corps of Engineers will be updating the 2009 Geomorphological Assessment Report for the Kansas River
- *Sandbar habitat modeling/inundation modeling?*
- *Monitoring & evaluation needs?*

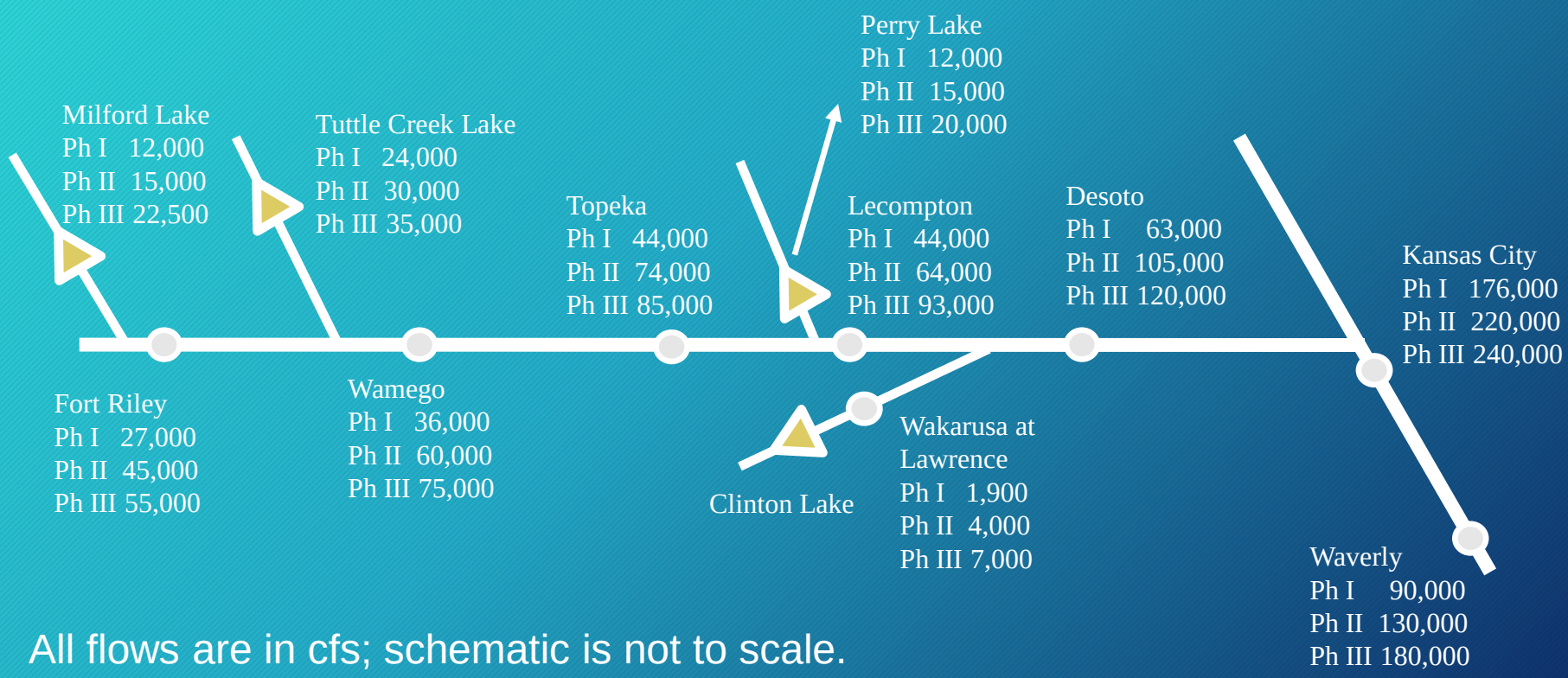
E-flow workshop in 2019

- Field trip for steering committee, technical team members to the Des Moines SRP project *(tentatively July 23-25)*
- E-flow Workshop preparation
  - Final report reviewed by Steering Committee
  - RPT facilitator training
  - Invitations sent to all stakeholders listed on the Team Charter

	2019									
	January	February	March	April	May	June	July	August	Septemb	October
Task 1 – Ecological data synthesis	Data analysis and report completion					Report review				
Task 2 – Communication and outreach							Kansas team visits Des Moines SRP	Summary report completed		
Task 3 – USGS water quality data	Report compilation and review									
Task 4 – Workshop preparation					RPT training	Workshop facilitator prep				
Task 5 – E-flow workshop								E-flow workshop held		


Questions?

Kansas River
Control Point Gages



All flows are in cfs; schematic is not to scale.

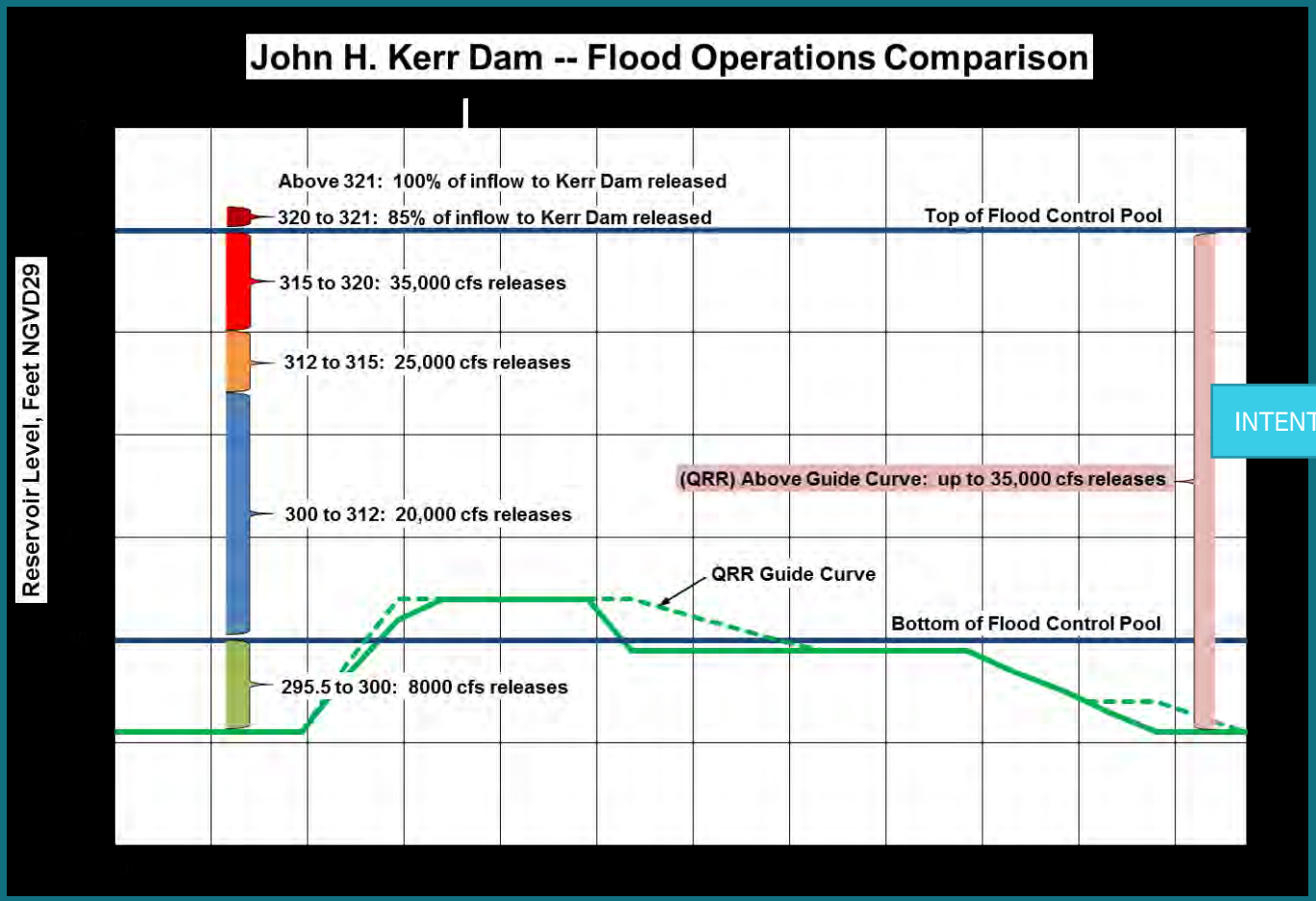
Kansas River
Low Flow Releases

Tuttle Creek Elevation	Flow Objectives in c.f.s. Topeka	DeSoto
1075-1070	750	1,000
1070-1065	750 (summer)	1,000 (summer)
-	600 (winter)	800 (winter)
1065-1048	600	750 (summer)
		700 (winter)

Summer = 1 May to 31 October
Winter = 1 November to 30 April

All flows are in cfs; schematic is not to scale.
Dissolved oxygen and dissolved solids can also impact releases.

Roanoke River SRP – Revised Flood Operations "Quasi-Run-of-River"



INTENT/BENEFITS

Releases more closely mimic natural inflows on a weekly basis up to 35K releases

Weekly Outflow ≈ Weekly Average Inflow into Kerr whenever above guide curve (up to 35K)

Still maintain consideration of special operations

Flow releases are within the constraints of the operation of the dam – the timing of release was changed with the project.


NEBRASKAland Magazine / NGPC


Wayne Hathaway


d Schmidt