Collaborative Adaptive Management (CAM) Progress Report
Stakeholder Committee
January 1, 2021– December 31, 2021

Committee Members

Monica Espinosa, EPA CAM Facilitator

Members	Representing
Karl Skala	City of Columbia
Justin Aldred	Boone County Commission
Todd Houts	University of Missouri
Tim Rielly	Missouri Department of Natural Resources
Tom Trabue	Chamber of Commerce
Leanne Tippett Mosby	"Smart Growth" Perspective
Susan Hart	Builder/Developer
Della Streaty-Wilhoit	Columbia School Board
Dee Dokken	Sierra Club
Diane Oerly	Stream Teams
Jeanine Pagan	Property Owner
Paul Mehrle	Property Owner
Frank Gordon	Soil & Water Conservation Board
Nathan Odle	Large Scale Commercial Representative
Jay Turner	Agricultural Community

In 2011 the U.S. Environmental Protection Agency (EPA) established the Hinkson Creek TMDL calling for a substantial reduction in peak flow for specified design storm events. An alternate plan was negotiated in 2012 among the EPA, Missouri Department of Natural Resources (MDNR), Boone County, the City of Columbia, and the University of Missouri which involved Collaborative Adaptive Management (CAM.) "Collaborative adaptive management is a science-driven, stakeholder-based process for decision-making while dealing with the scientific unknowns inherent in many physical and biological systems. It uses" an iterative "process to make changes and then to determine the effect of those changes." http://www.helpthehinkson.org/stakeholders.asp The EPA provides a facilitator, MDNR provided three years of testing and participates in CAM committees, and the local entities share costs and provide support for the CAM committees. The standing committees are: Stakeholder Committee, Action Team, and Science Team. The stakeholders were selected to represent a broad spectrum of local interests who make recommendations to Boone County, the City of Columbia, and the University of Missouri. The Action Team members are professionals associated with Boone County, the City of Columbia, the University of Missouri, Boone County

Regional Sewer District, and Missouri Department of Transportation who provide support to the Stakeholder Committee. The Science Team members are volunteer scientists and a stormwater engineer. This team makes recommendations to the stakeholders about projects to learn more about Hinkson Creek and ways to improve its water quality. To date, Stakeholder Committee recommendations have been based on recommendations from the Science and Action Teams.

The goal of the CAM process is to improve the water quality of Hinkson Creek so it can be removed from an impaired status. Hinkson Creek will continue to be categorized as impaired until the overall percentage of MSCI scores greater than 16 meets Missouri's Listing Methodology definition of an unimpaired water. This determination incorporates all the macroinvertebrate data collected from Hinkson Creek. As more and more projects are implemented in the watershed, DNR will target periodic future data collection, then analyze the data to determine if the instream effects from these projects have reached the point where more recent data indicates attainment. As an aside, dissolving CAM would reinstate the EPA TMDL process.

The following is a summary of the CAM Stakeholder Committee activities for 2021 with appropriate online links. The CAM Stakeholder Committee met four times. Minutes exist for these meetings and can be found at http://www.helpthehinkson.org/CAMStakeholders.asp.

I. Presentations and Reports
   a. "Kiss the Ground" Virtual Movie Screening and Panel Discussion regarding regenerative agriculture. January 28, 2021.
   b. Laura Wiseman, University of Missouri: Forum Nature Area Level Spreader Final Monitoring Report presentation. April 8, 2021.
   c. Cody Lubbering, Geosyntec Consultants: Hinkson Creek Aquatic Macroinvertebrate Data Mining Final Report presentation. April 15, 2021.
   d. Dan Obrecht, University of Missouri; A Review of Chloride in Hinkson Creek presentation. April 22, 2021.
   e. Tim Rielly, Missouri Department of Natural Resources and Robb Jacobson, Ph.D., United States Geological Survey: Hinkson Creek Science Strategy presentation. April 29, 2021.
   f. Tom Wellman, City of Columbia Stormwater Utility: Hinkson Creek Stream Stabilization Project presentation. December 13, 2021.

II. Riparian Sub-Committee met six times in 2021. Minutes are at: http://www.helpthehinkson.org/RiparianSub-committee.asp

III. Field Trips and Special Meetings
   a. The Riparian Subcommittee took a field trip to the El Chaparral demonstration site, where City staff discussed what it took to restore the site and lessons learned.

IV. Recommendations and Actions
   a. Actions:

i. Sediment Mapping Project was completed in August 2018 and is in the data analysis phase.
ii. University of Missouri Watershed Water Quality Assessment is underway, with 30 sites on mainstem Hinkson Creek and 10 sites on the tributaries being sampled. Five sampling events were held in 2021.
iii. LiDAR Analysis Project – Boone County GIS completed an initial analysis of the stream corridor in 2021, which showed amounts of sediment erosion and deposition. The Science Team is studying the results to determine if there are any "hot spots" along the corridor that need attention or additional monitoring.
iv. USGS Comprehensive Sampling – This project was approved for funding in 2021. Sampling is set to begin in the spring and fall of 2022.
v. Lincoln University Gauging Stations – Dr. Shawn Zeiger has installed stage samplers at Dr. Hubbart's old gauging station sites along Hinkson Creek.

b. Recommendations:
i. Stakeholder member replacement for resigned and non-active members.
ii. Establishment of a Chloride Task Force to analyze current salt usage and application methods in the watershed; recommend practices, policies, and incentives for applying salt wisely; and explore other deicing alternatives for sodium chloride.
iii. CAM website redesign.

c. Proposals:
i. None

V. Macroinvertebrate Results

a. Macroinvertebrate results through 2017 are presented in tabular form at: http://www.helpthehinkson.org/documents/2017_Hinkson_MSCI_Table%20(002).pdf The last nine test periods produced mixed results. The best results were in the Fall of 2014 (8 of 11 sites fully supporting) and Spring of 2016 (8 0f 11 fully supporting). In the Fall of 2014 seven supporting sites were at stations HC 4-8 while in Spring 2016 seven supporting sites were at stations HC 1-5.5. The worst results were the Spring of 2017 (3 of 11 supporting) and the Fall of 2017 (2 of 8 supporting). Every site was fully supporting at least three times (3-6) and not fully supporting at least two times (2-6). Very dry weather probably was a factor for some of the poor results.

b. Due to the mixed results and cost of testing, the Action Team decided not to sample for the next 1-3 years until they know where to target their sampling.

c. The Hinkson Creek Aquatic Macroinvertebrate Data Mining Project (IV.a.i. above) introduced a Request for a Statement of Qualifications (RSQ) on March 1, 2019. A Consultant was selected in July and their findings were presented at the first Science Team meeting after the contract ended in late July 2020. Findings

were presented at the All Team Meeting on April 15, 2021. The recommendation of the study is “to preserve and improve the aquatic life in Hinson Creek (to) revolve around holistic watershed management, planning, best management practice (BMP), and monitoring tools to assess performance.” An area of focus identified in the study is to address Chlorides through implementation of non-structural BMPs. A list of recommendations specific to the results of this study can be found in Section 6 of the Aquatic Macroinvertebrate Data Mining Report. The report can be found at helpthehinkson.org/documents/Hinkson%20Macroinvertebrate%20Data%20Mining%20Report.pdf.

Appendix

The City of Columbia, Boone County, and the University of Missouri completed additional stormwater projects that were independent of CAM. Below are some of these projects.

City of Columbia

Stormwater and Sanitary Sewer Utility Work:

Stormwater:

- Garth at Oak Tower Culvert Replacement
- Greenwood South Culvert Replacement
- Aldeah at Ash Storm Pipe Lining & Rehab - installed 177 LF of new storm sewer, 4 inlets, and lined 323 LF of existing storm sewer
- Ross St Stormwater Improvements (CIP), Flat Branch - 150 LF of new storm sewer, 3 inlets & 3 structures to replace failing system & relocate out from under a home
- Ridge Road Stormwater (Maintenance), County House Branch - 95 LF of new storm sewer & 3 inlets
- Medavista/Ridge (Maintenance), County House Branch - 80 LF of new storm sewer & 2 inlets
- E. Business Loop (Emergency), Hinkson Creek - 155 LF of new storm sewer & 1 structure

Wastewater Treatment Plant & Wetlands:

- WWTP Digester Rehab

Sanitary Sewer:

- 5th to Wilkes - Installed 847 feet of sewer main
- Stewart, Ridge, & Medavista PCCE #3, Phase 3 - Replaced 1,273 feet of sewer main
- North Garth Sewer -Replaced 551 feet of sewer main

University of Missouri

- Installation of a stormwater detention facility ant the UM Library depository building.
- Installation of a stormwater volume storage area at the new Next Gen Precision Health Building, which prevents additional runoff but also reduces the predevelopment (pre-Next Gen) runoff.
- Installation of a system to capture stormwater from pavement runoff and divert runoff into planting beds for use as irrigation at the reconstructed School of Nursing Building.