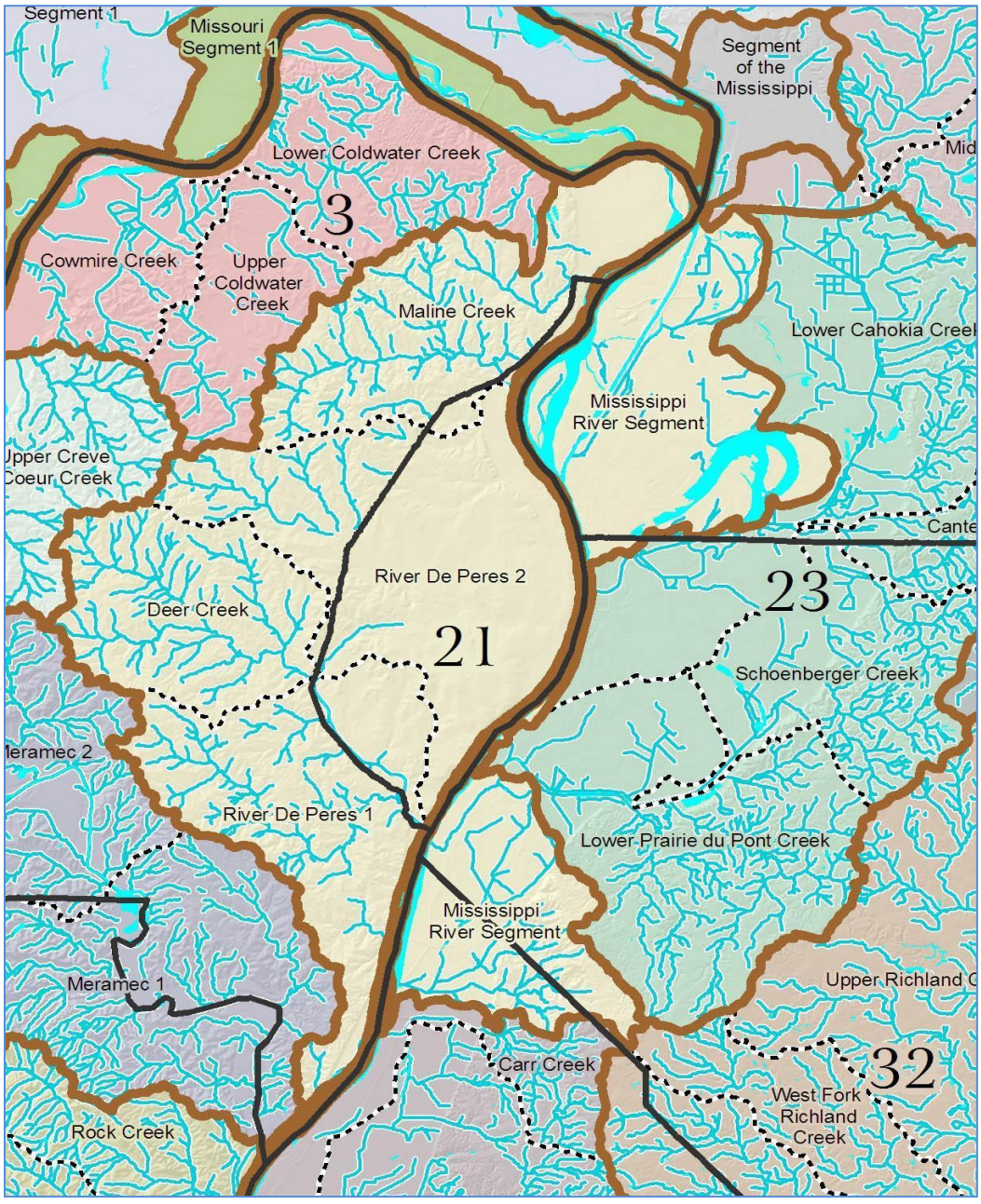
CHAPTER 1 – HISTORY OF WATERSHED PLANNING EFFORTS AND STAKEHOLDER ENGAGEMENT

The Deer Creek Watershed (HUC 071401010504) is a sub-watershed of the River des Peres Watershed (Map 1-1). Due to the size and complexity of the River des Peres watershed, any watershed planning efforts need to occur on the sub-watershed (12-digit HUC) size. The Deer Creek Watershed is a good candidate for planning efforts due to the amount of citizen involvement, previous studies conducted, and historical water data available. It was originally selected because the River des Peres had been identified as impaired for low DO and chlorides on the 303(d) list of impaired waters in 2009. In 2020, River des Peres was identified as impaired for *Escherichia coli (E. coli)* and chloride and is no longer identified as impaired due to low dissolved oxygen.



Map 1- 1. Deer Creek Watershed is a sub-watershed of the River des Peres Watershed

Also in 2020, Deer Creek and its tributary, Black Creek, are now identified as impaired for chloride on the 303(d) list. Two Mile Creek is identified as impaired to *E. coli* on that list too. A Total Maximum Daily Load (TMDL) report for *E. coli* for Deer Creek and Black Creek was approved by the U. S. Environmental Protection Agency (EPA) in 2019. See Appendix 2-A Bacterial TMDL. A TMDL for chloride for Deer Creek and Black Creek is being prioritized as high and is identified on the 2020 303(d) List as being scheduled for 2025. A TMDL for *E. coli* for Twomile Creek is being prioritized as medium and is scheduled for 2026-2030 on that list too.

1.1 Timeline of Events

The earliest known research conducted in the Deer Creek Watershed was "A Study of Water Quality in Deer Creek", conducted August of **1963.** This study was completed by the Missouri Water Pollution Control Board following the construction of a trunk sewer from the City of Kirkwood to its confluence with River Des Peres. Four sites were chosen along Deer Creek and tests were conducted on the physical, chemical, biological, and bacteriological characteristics of the creek over a three-day period. Since then, numerous studies have been carried out for the purpose of improving the management of the Deer Creek Watershed, including multiple Stormwater Management Model (SWMM) and Federal Emergency Management Agency (FEMA) modeling efforts, as well as water quality monitoring by Metropolitan St. Louis Sewer District (MSD) and ongoing stream monitoring efforts undertaken by Missouri Stream Teams.

In May of **1998,** Metropolitan St. Louis Sewer District completed a major study of the Deer Creek Watershed as part of its Stormwater System Master Improvement Plan. The study was conducted and submitted by CH2MHILL in association with Kowelman Engineering, Inc. In the study, SWMM simulated watershed discharge, stream flow depths and velocities for both existing and future development using a 2-, 15- and 100-year rainfall event. A complete literature survey of previous studies conducted in the watershed can be found in Chapter 2 of this document.

In April of **2008,** a group of citizens concerned about Deer Creek formed a Creeks Committee and approached Missouri Botanical Garden (MBG) to sponsor their work. Missouri Botanical Garden agreed, provided the scope of the project included the entire Deer Creek Watershed. In July of 2008, Missouri Botanical Garden received a planning grant from the Mabel Dorn Reeder Foundation to study the feasibility of a Deer Creek Watershed Initiative. The goal of the study was to examine the feasibility of implementing plant-based strategies to reduce erosion, property loss, infrastructure damage, flooding, sedimentation, and water pollution in the watershed. Dr. Peter Raven, President of Missouri Botanical Garden, met with Jeff Theerman, Executive Director of Metropolitan St. Louis Sewer District, to explore a partnership between the two institutions in the watershed. Dr. Peter Raven also hosted a meeting of 30 citizen leaders in September 2009 to seek their guidance in the planning process.

The Missouri Botanical Garden Deer Creek Watershed Initiative four project phases have to date been funded through the 319 Section Nonpoint Source Implementation Grant Program, Phase I (**subgrant # G09-NPS-13**) in June **2009**, Phase II (**subgrant # G11-NPS-15**) in April **2011**, Phase III (**subgrant # G14-NPS-04**) in January **2015**, and Phase IV (**subgrant # G19-NPS-11**) in October **2019**, which have all implemented activities and best management practices (BMPs) that help address the stream bacteria impairment and other pollutants to improve the water quality of Deer Creek. The past projects have been highly successful, completing all its original implementation goals ahead of schedule and receiving additional funding in Phase II and Phase III, to continue the well-accepted Rainscaping Cost-Share Program and to install additional stream demonstration projects. The accomplishments include the installation of rain gardens, woodland restoration, lawn alternatives, creek corridor vegetative buffers, permeable pavers, rain barrels, bioswales, bioretention systems and bioengineered creek bank stabilization. The project has

been implementing the goals and objectives of the Deer Creek Watershed Management Plan as indicated in Chapter 5 of the watershed plan. Since the Deer Creek Watershed Initiative planning efforts began, there have been 466 BMP installations completed in the watershed to date, currently resulting in load reductions of 187.5 tons of sediment, 109 lbs. of nitrogen, and 21.5 lbs. of phosphorus per year from Deer Creek. Rainscaping is any combination of plantings, water features, catch basins, permeable pavement, and other activities that manage stormwater as close as possible to where it falls, rather than moving it someplace else. Rainscaping practices can include features such as rain gardens, bioswales, lawn alternatives and trees and shrubs, green roofs, etc. to slow down, soak up and reuse rainwater before it carries pollutants to a local stream. To view photographs of rainscaping by types of projects that have been funded and installed, visit deercreekalliance.org/rainscaping_projects. More details on accomplishments achieved through Phase III can be found below in Table 1-1 and at deercreekalliance.org/achievements.

Table 1-1. Accomplishments through Phase III

<table>
<tr><th></th><th>Planning Grant</th><th>Phase I</th><th>Phase II</th><th>Phase III</th></tr>
<tr><td>Dates</td><td>July 1, 2008 - June 1, 2009</td><td>June 1 2009 to September 30, 2011</td><td>April 1, 2011 to March 30, 2015</td><td>January 1, 2015 to September 30, 2019</td></tr>
<tr><td>Amount</td><td>$20,000</td><td>$390,446 MoDNR/ $260,363 match</td><td>$830,724 MoDNR/ $553,816 Match</td><td>$1,347,960 MoDNR/ $1,012,116 match</td></tr>
<tr><td>Watershed Planning</td><td>Explored how to set up DCWA within MBG and in the community</td><td>Developed draft and final versions of 9 Element Watershed Plan. Formation of 3 planning committees & meetings.</td><td>MoDNR accepted plan. (2011) Plan Summary & muni level watershed maps created. Drafted & secured endorsement resolutions from 20 municipalities. (2012)</td><td>Landscape scale tree planting planning. Meetings with 3 planning committees including 10 Year Celebration</td></tr>
<tr><td rowspan="5">Demonstrat -ion Projects</td><td rowspan="5"></td><td colspan="2">Worked with MSD to secure voluntary participation in & design rain gardens in private yards in U.City & Creve Coeur & Mount Calvary Church in Brentwood. Final installations in 2012</td><td>Chaminade College Preparatory School Front Lawn Restoration Project Design & Installation</td></tr>
<tr><td colspan="2">GRG designed bioretention systems @ Rocketship Park in Maplewood (2011). Installed in 2012. DCWA provides signage & maintenance training for City of Maplewood staff in 2012</td><td>Metro Wetland Planning with GRG, Metro, City of Brentwood & Technical Advisory Group</td></tr>
<tr><td>City of Webster Groves installed rain gardens in Larson Park (2011)</td><td>SWT designs plans for 3 City of Richmond Heights bioretention systems (2013)</td><td></td></tr>
<tr><td>City of Clayton installed bioretention system in Shaw Park</td><td>City of Frontenac rain gardens designed (2012) and installed (2013)</td><td>Glen Abbey stream forming flow rain gardens with City of Frontenac</td></tr>
<tr><td>Eagle Scout installed rain garden @ Annunziata Church & School (2011)</td><td>Rain barrel distribution project with River des Peres Watershed Coalition</td><td>Monsanto-Sunswept creek bank stabilization project with City of Frontenac.</td></tr>
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	Phase I	Phase II	Phase III
Demonstration Projects (cont.)	Begin partnership with **Deer Creek Club** in **Ladue** 10 year plan to remove invasive Bush honeysuckle in 2010. Deer Creek Club Master Plan completed by SWT in 2012		
		Bioengineered Creek bank stabilization planning with **Metropolitan St. Louis Sewer District** (2012). SWT completed Denny Creek riparian corridor planting plan (2014) Secured maintenance agreements with homeowners (2015) MSD installed. (2017-18)	
Implementation		BMP Guidelines for homeowners completed, MBG Rainscaping Guide Website established (2012)	
		Rounds 1, 2, 3 of Rainscape Rebates implemented.	Pilot Round, and Rounds A, B, C, D, E, F, G of Rainscaping Cost-Share Program implemented
		Focus Area #1 (Pebble, Denny, Monsanto-Sunswept sub-watersheds identified	Focus Areas #2 (Shady Grove and Rock Hill) and #3 (Lower Deer Creek) identified
Water Quality Monitoring & Modeling	Partnered with Litzsinger Road Ecology center and Washington University to collect and analyze water quality data		Baseline data collected for 3 tributaries in Focus Area #1
		Pollutant load reduction impacts of installed projects calculated annually and shared on annual reports.	
Public Engagement/ Outreach & Education	Ladue Day of Service-Creek Clean Up (2009)	Webster Groves mini Tree Hunt (2011)	Deer Creek Speaker Series/Maintenance Training Workshops (2015-17)
	Creek Naming Project (2010)	River des Peres trash Bash site leader (2012)	
	Tree Booklet for Elementary students with Ladue Garden Club (2010)	2 Mount Calvary Rain Garden Maintenance Work Days (2014)	Spring & Fall Maint. Work Days for invasive species removal. (2018-19)

	Phase I	Phase II	Phase III
Public Engagement/ Outreach & Education (cont.)	Deer Creek Friends quarterly meetings @ Deer Creek Club	Exhibiting @ festivals, present @ conferences	
	Monthly email newsletters		Quarterly email newsletters
	1st version Deer Creek Website deercreekfriends.net	deercreekalliance.org website	Website and social media updates

1.2 Deer Creek Watershed Alliance Stakeholder Engagement

DEER CREEK WATERSHED MANAGEMENT PLAN

Your help is needed on a project that will develop and document a Deer Creek Watershed Management Plan. Partners include East-West Gateway Council of Governments, Metropolitan St. Louis Sewer District, Missouri Botanical Garden, Washington University, Missouri Department of Natural Resources, EcoWorks Unlimited, and local municipalities.

The Plan will reflect current conditions, issues and concerns, and water quality data within the Deer Creek watershed. Data gathered will be analyzed to identify causes and sources of pollution that need to be controlled. Goals and objectives will be developed for the critical areas with management measures developed to achieve the goals.

As a resident or landowner in the watershed, we are seeking your issues and concerns to include in the Plan. Please provide comments on this form.

Issues and Concerns (Please describe in as much detail as possible):

Contact Information (Optional):

Name: _____

Address: _____ City: _____

Phone: _____ Email: _____

Would you be interested in having a meeting to further discuss these issues? _____

For more information contact: Bill Aho waho@ecoworksunlimited.com (314) 799-5044

This project is partially funded by US EPA Region 7 through the Department of Natural Resources (subgrant number G09-NPS-13), under Section 319 of the Clean Water Act.

Missouri Botanical Garden · MSD · East-West Gateway Council of Governments · Missouri Department of Natural Resources

To help facilitate cleaner, safer water in the Deer Creek Watershed, Missouri Botanical Garden established a Deer Creek Watershed Alliance. The mission of the Deer Creek Watershed Alliance is to assess and improve water quality, with a focus on native soil and plant-based solutions.

1.21 Planning Committees

Stakeholder inputs to the watershed planning process are driven by three planning committees that meet annually to contribute to the development of the watershed management plan and to discuss its potential updates in addition to providing project implementation input on an ongoing basis. These key stakeholder groups are 1) the *Deer Creek Steering Committee*, 2) the *Deer Creek Community Leaders Task Force,* and 3) the *Deer Creek Technical Advisory Group.*

Deer Creek Steering Committee

The *Deer Creek Steering Committee* is a citizen-led committee operating with the guidance and support of Missouri Botanical Garden. This committee keeps watershed citizens updated and engaged through quarterly email

newsletters, a website (www.deer creek alliance.org) and workshops. Anyone who registers for the monthly email newsletter is considered a Deer Creek Watershed Friend. As of October 2021, there are 3,027 email newsletter recipients/ Deer Creek Watershed Friends participants.

This committee also invites citizens to participate in meetings as well as public engagement projects such as the 2010 Tributaries Naming Project where 14 unnamed tributaries in the Deer Creek Watershed received names (Map 2-1).

Deer Creek Community Leaders Task Force

The *Deer Creek Community Leaders Task Force,* includes entities with jurisdictional or planning authority in the watershed. The Deer Creek Watershed intersects with all or part of 21 municipalities in St. Louis County. In addition, other entities with jurisdictional or planning authority in the watershed include Metropolitan St. Louis Sewer District, East-West Gateway Council of Governments, St. Louis County Government, Great Rivers Greenway District, Missouri Department of Natural Resources, and the U.S. Army Corps of Engineers.

Deer Creek Technical Advisory Group

The Technical Advisory Group includes engineers, landscape architects, horticulturalists, ecologists, and other technical experts from government agencies, consulting firms, and non-profit organizations, including American Society of Civil Engineers-St. Louis Section, DJM Ecological Services, Jacobs Engineering, EDM Inc, Forest Releaf, Great Rivers Greenway, Horner & Shifrin, Metropolitan St. Louis Sewer District, Missouri Botanical Garden, Missouri Department of Conservation, Missouri Department of Natural Resources, Open Space Council, Poehlman & Prost Inc, Reitz & Jens, River des Peres Watershed Coalition, St. Louis Community College at Meramec, StormwaterSTL, The 2 Sallys, US Geological Survey, and Washington University.