

CHAPTER 1 – HISTORY OF WATERSHED PLANNING EFFORTS & STAKEHOLDER ENGAGEMENT



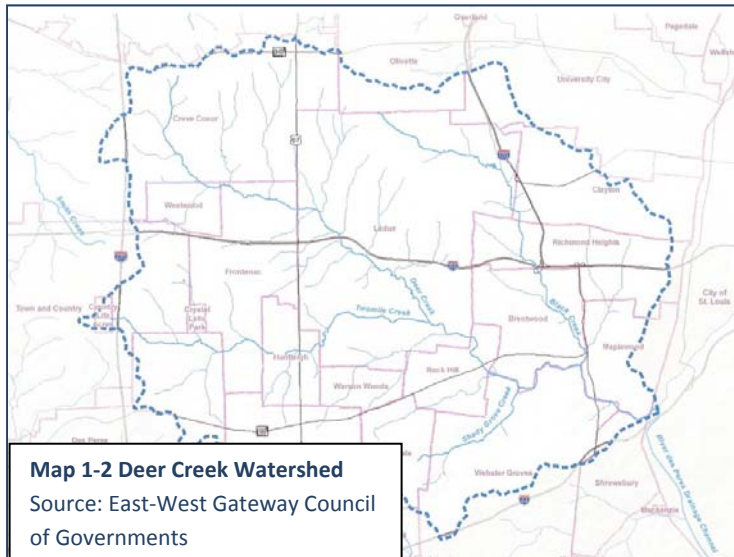
Map 1-1 River Des Peres Watershed
Source: EW Gateway Council of Govts.

The Deer Creek Watershed is a sub-watershed of the River des Peres Watershed. 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 is identified as impaired for *Escherichia coli* (E. coli) and chloride.

Also in 2020, Deer Creek and its tributaries, Black Creek and Two Mile 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, and TMDLs for E. coli on Deer and Black Creeks were approved by EPA in 2019.

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



Map 1-2 Deer Creek Watershed
Source: East-West Gateway Council of Governments

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 Deer Creek, including multiple FEMA and SWMM modeling efforts, as well as water quality monitoring by Metropolitan St. Louis Sewer District, and ongoing stream monitoring efforts undertaken by Missouri Stream Teams in the Deer Creek Watershed.

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, Stormwater Management

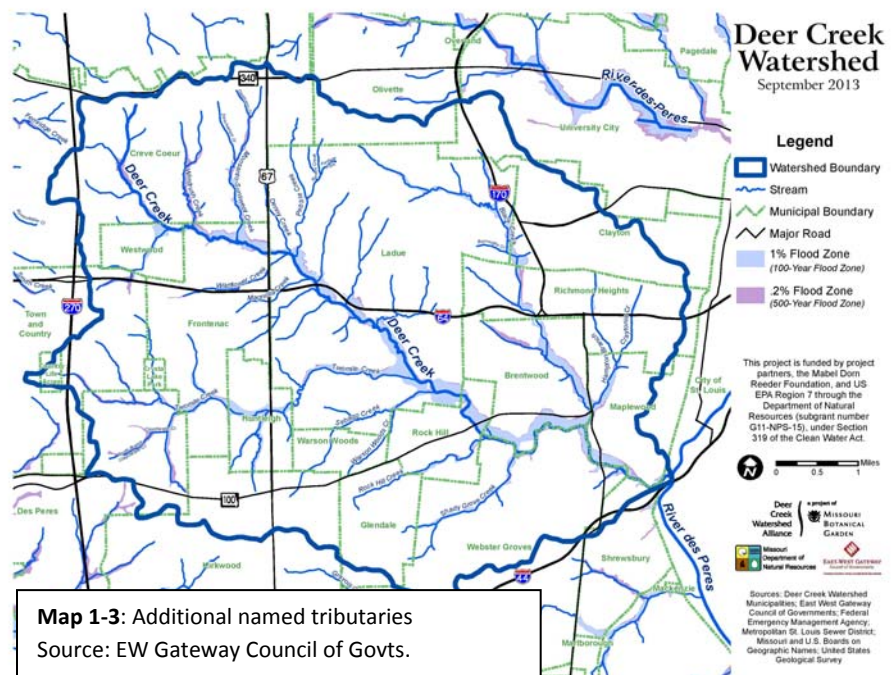
Model (SWMM) simulates watershed discharge, stream flow depths and velocities for both existing and future development using a 2, 15 and 100-year rainfall event.

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 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.

In June **2009**, a 319 grant (G09-NPS-13) from U.S. EPA through Missouri Department of Natural Resources was awarded to Missouri Botanical

Garden for Phase I of a Missouri Botanical Garden Deer Creek Watershed Initiative. The goal of the grant-funded project was to reduce organic waste pollution in the Deer Creek watershed, primarily through the implementation of bioretention and other green infrastructure methods. Strategies included working with schools, demonstration projects, data collection, and community outreach (including a creek naming initiative where 14 tributaries received names (Map 1-3), and the development of a watershed plan.



In April **2011** Missouri Botanical Garden was awarded a grant to implement Phase II of the Deer Creek Watershed Initiative. In January **2015** Missouri Botanical Garden was awarded a grant to implement Phase III of the Deer Creek Watershed Initiative. In October **2019** Missouri Botanical Garden was awarded a grant to implement Phase IV of the Deer Creek Watershed Initiative.

As of October 2019, the Deer Creek Watershed Alliance has helped install 390 rainscaping projects in the watershed. These projects are currently removing 186.16 tons/yr of sediment, 83.2 lbs/yr of nitrogen, and 16.58 lbs/yr of phosphorus from Deer Creek. More details on accomplishments achieved through Phase III, below:

	Planning Grant	Phase I	Phase II	Phase III	
Dates	July 1, 2008 - June 1 2009	June 1 2009 to September 30, 2011	April 1, 2011 to March 30, 2015	January 1, 2015 to September 30, 2019	
Amount	\$20,000	\$390,446 MoDNR/ \$260,363 match	\$830,724 MoDNR/ \$553,816 Match	\$1,347,960 MoDNR/ \$1,012,116 match	
Watershed Planning	Explored how to set up DWCA within MBG and in the community	Developed draft and final versions of 9 Element Watershed Plan. Formation of 3 planning committees & meetings.	MoDNR accepted plan. (2011) Plan Summary & muni level watershed maps created. Drafted & secured endorsement resolutions from 20 municipalities. (2012)	Landscape scale tree planting planning. Meetings with 3 planning committees including 10 Year Celebration	
Demonstration Projects		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		Chaminade College Preparatory School Front Lawn Restoration Project Design & Installation	
		GRG designed bioretention systems @ Rocketship Park in Maplewood (2011). Installed in 2012. DCWA provides signage & maintenance training for City of Maplewood staff in 2012		Metro Wetland Planning with GRG, Metro, City of Brentwood & Technical Advisory Group	
		City of Webster Groves installed rain gardens in Larson Park (2011)	SWT designs plans for 3 City of Richmond Heights bioretention systems (2013)		
		City of Clayton installed bioretention system in Shaw Park	City of Frontenac rain gardens designed (2012) and installed (2013)	Glen Abbey stream forming flow rain gardens with City of Frontenac	
		Eagle Scout installed rain garden @ Annunziata Church & School (2011)	Rain barrel distribution project with River des Peres Watershed Coalition	Monsanto-Sunswept creek bank stabilization project with City of Frontenac .	
		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)		

	Phase I	Phase II	Phase III
Implementa- tion		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 Litzinger 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)
	Sustainable Schoolyards Teacher Institute in partnership with LREC (Summers, 2009-2011)	Water quality monitoring with schools	
	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 & social media updates

1.2 DEER CREEK WATERSHED ALLIANCE STAKEHOLDER ENGAGEMENT

The image shows a public comment form titled "DEER CREEK WATERSHED MANAGEMENT PLAN". The form includes the following sections:

- DEER CREEK WATERSHED MANAGEMENT PLAN**
- Introduction: "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."
- Plan Purpose: "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."
- Request for Input: "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: "Issues and Concerns (Please describe in as much detail as possible):" followed by five horizontal lines for text entry.
- Contact Information (Optional):
 - Name: _____
 - Address: _____ City: _____
 - Phone: _____ Email: _____
 - Would you be interested in having a meeting to further discuss these issues? _____
- Footer: "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."
- Logos: Missouri Botanical Garden, East-West Gateway, and 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 Alliance is to assess and improve the Deer Creek Watershed, with a focus on plant-based solutions.

1.2.1 PLANNING COMMITTEES

Stakeholder inputs to the watershed planning process are driven by three planning committees 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. In addition to the annual meetings of this group, citizens at large are actively encouraged to engage through quarterly email newsletters, a website (www.deercreekalliance.org), and citizen engagement projects.

Anyone who registers for the monthly email newsletter is considered a Deer Creek Watershed Friend. As of May 2020, there are 3,012 email newsletter recipients/ Deer Creek Watershed Friends participants.

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.

1.22 ADDITIONAL KEY PARTNERSHIPS

EAST WEST GATEWAY COUNCIL OF GOVERNMENTS

East-West Gateway Council of Governments is the regional planning agency for the Greater St. Louis Region. They have an Environment and Community Planning Division and a GIS Division, as well as experience in watershed planning. East West Gateway provides GIS mapping services and background data information.

METROPOLITAN ST. LOUIS SEWER DISTRICT

Metropolitan St. Louis Sewer District is playing a significant watershed planning role through participation on the Community Leaders Task Force and Deer Creek Technical Committee. In addition, MSD leads regional stormwater NPDES management efforts, and has initiated the development of a regional plan to address flood concerns. Furthermore, MSD has developed and submitted to U.S. EPA a plan for addressing CSO discharges in the St. Louis region, and is developing a plan to address SSO's in the region as well.

MISSOURI BOTANICAL GARDEN

Missouri Botanical Garden plays a facilitation role between project partners on watershed planning efforts.

MISSOURI DEPARTMENT OF NATURAL RESOURCES & U.S. EPA REGION 7

The watershed planning process for the Deer Creek Watershed is partially funded by US EPA Region 7 through the Department of Natural Resources (sub grant number G09-NPS-13), under Section 319 of the Clean Water Act. In addition, Missouri Department of Natural Resources staff provides technical expertise to assist in watershed planning efforts.

MUNICIPAL PARTNERSHIPS

The cities of Brentwood, Clayton, Creve Coeur, Des Peres, Frontenac, Huntleigh, Ladue, Maplewood, Rock Hill, University City and Webster Groves are active participants in the watershed planning process. Each of these municipalities has a representative participating in the Community Leaders Task Force. In addition, the City of Frontenac and the City of Clayton have separately conducted their own stormwater master planning efforts.

WASHINGTON UNIVERSITY

For the purpose of assisting with this planning effort, Washington University has conducted water quality analyses of data compiled from Deer Creek water quality monitoring to help inform the watershed planning process.