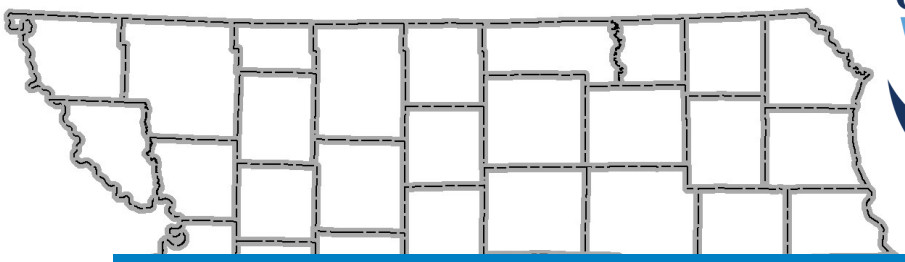
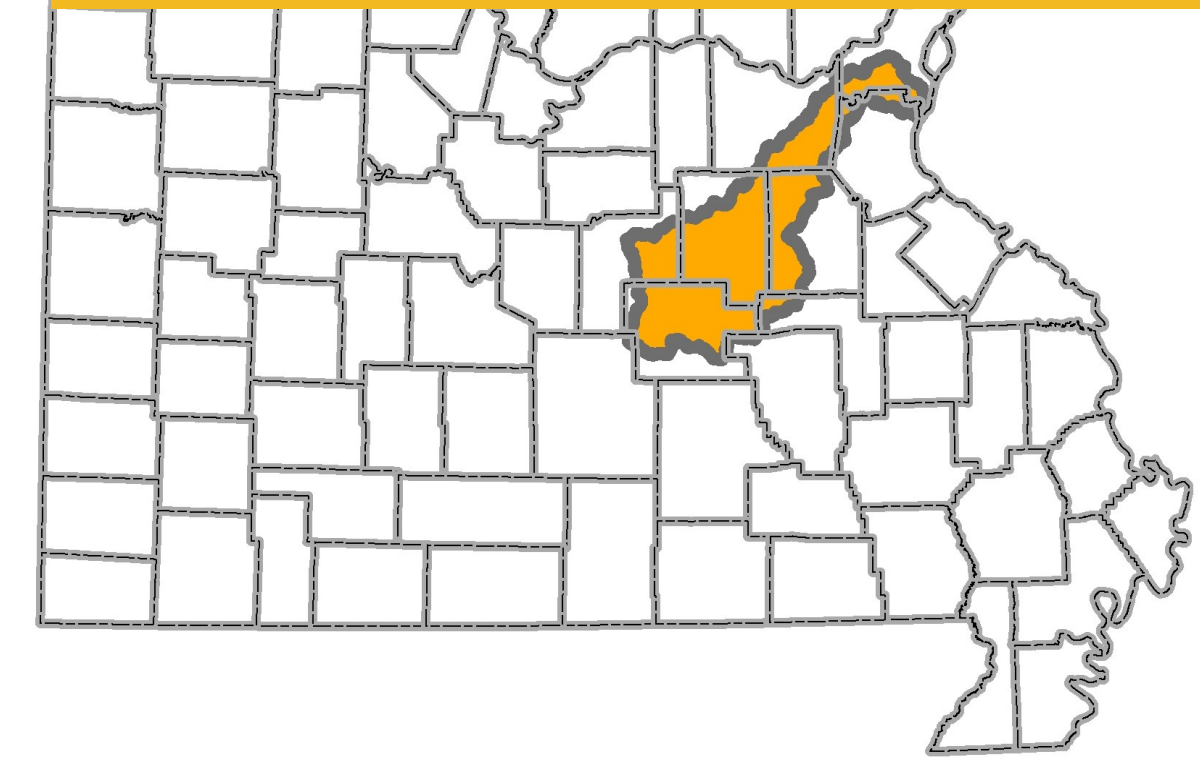


Our Missouri WATERS

Planning for a **Healthy Watershed**

Meramec River Watershed



The Missouri Department of Natural Resources (DNR) seeks to improve the availability of water resource information to communities where impact to these water resources is felt most. The information presented in this brochure is intended to increase awareness of how activities on land and in water have an influence on water resource quality and quantity. The department greatly values local input and engagement regarding the mission of ensuring safe and ample water resources, and will continue to seek local guidance to further focus department efforts and funding strategies for the betterment of *Our Missouri Waters.*

MISSOURI DEPARTMENT OF NATURAL RESOURCES

HUC-8: 07140102
10/2016

Meramec River Watershed

Planning for a Healthy Watershed

What is a watershed?

A watershed (aka basin) is an area of land defined by ridges, from which waters flow into a particular lake, river or wetland. All the storm-water that falls on land inside the Meramec Watershed boundary eventually flows to the Meramec River.

Focus Watersheds

Our Missouri Waters includes 66 watersheds across the state. DNR has established a set of priority watersheds to focus on each year until all 66 watersheds have been evaluated. The department identified the Meramec watershed as a priority to focus on in 2015-2016.

Watershed Advisory Committees

To help achieve the goals of OMW, DNR would like to establish a Watershed Advisory Committee (WAC) in watersheds where this is locally advised. The WAC will bring initiatives happening in a watershed together to strengthen collaboration and coordinate planning efforts. This will help to focus available resources and funding to address the priorities.

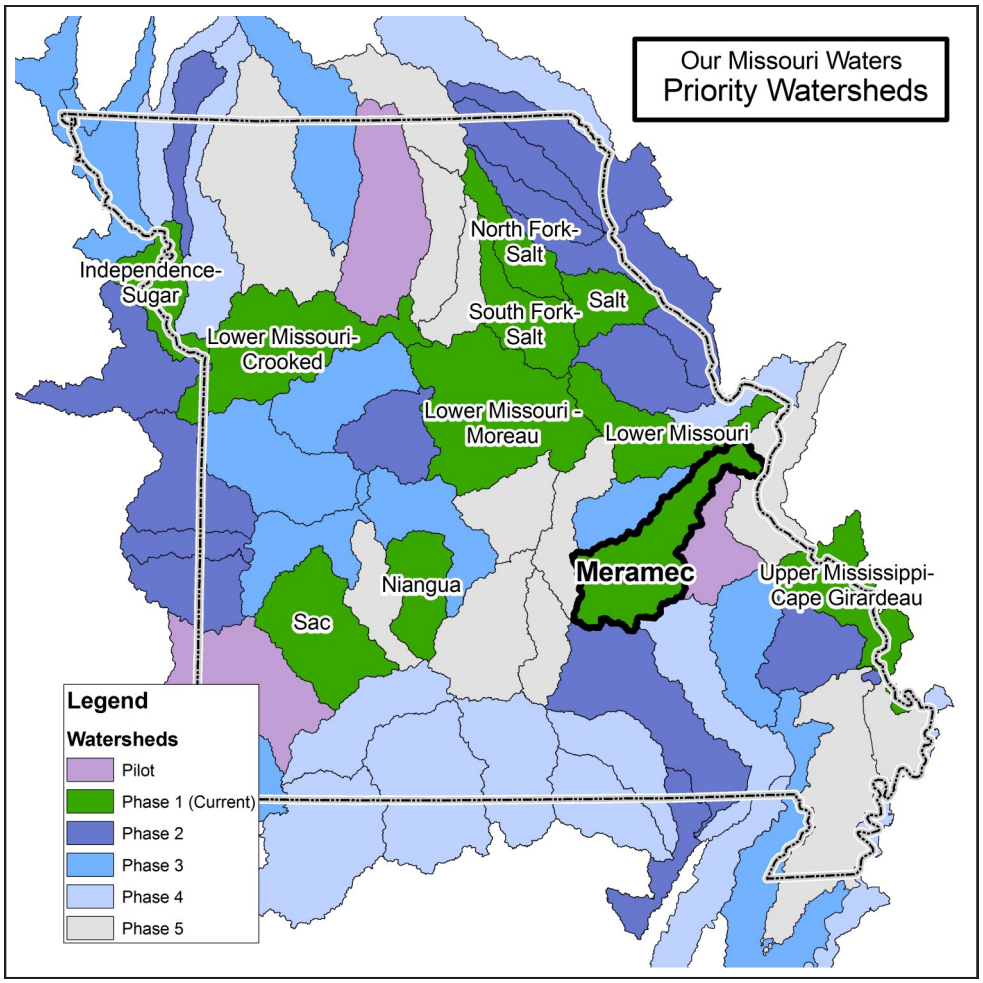
Our Missouri WATERS

Our Missouri Waters Initiative

Missouri is blessed with natural streams, lakes and rivers as no other state in the nation. They play an essential role in the overall health and well-being of each Missourian and the economy of our state. We have made significant improvements to our state's water quality. To continue this progress, the Missouri Department of Natural Resources (DNR) has begun an initiative, called *Our Missouri Waters (OMW)*, that will improve the way we protect and preserve our watersheds.

Water, like all natural resources, belongs to everyone. Clean and abundant water is important to all of us and local participation is vital to successfully managing the water resources within a watershed. People who live and work in the watershed have the biggest stake in its health and need to be part of the process to determine the best way to address specific watershed management needs. The OMW approach builds local partnerships to develop a common understanding of the health and challenges of the watershed, identifies priorities and then works together to achieve common goals.

This brochure explains the OMW approach in the Meramec Watershed, including the process undertaken to understand issues and to establish a watershed advisory committee (in the lower part of the watershed) as well as other forums for working together to address the health of the watershed.



Meramec River Watershed

Planning for a Healthy Watershed

Watershed Information

The Meramec River watershed is divided into **upper** and **lower** sections because of different conditions and characteristics. The more rural upper watershed includes Crawford, Dent, Phelps, and Washington counties; the more densely populated lower watershed includes Franklin, Jefferson and St. Louis Counties.

Land use in the upper watershed is primarily forest with some pasture or hay. Land use in the lower watershed is more densely populated and developed.

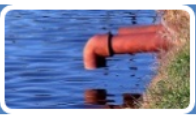
The Meramec watershed is home to approximately 364,050 people. The Meramec River is the primary source of drinking water for more than 200,000 people.

2nd longest un-impounded river in MO (220 miles long)

Heavily used for boating, fishing, canoeing and rafting

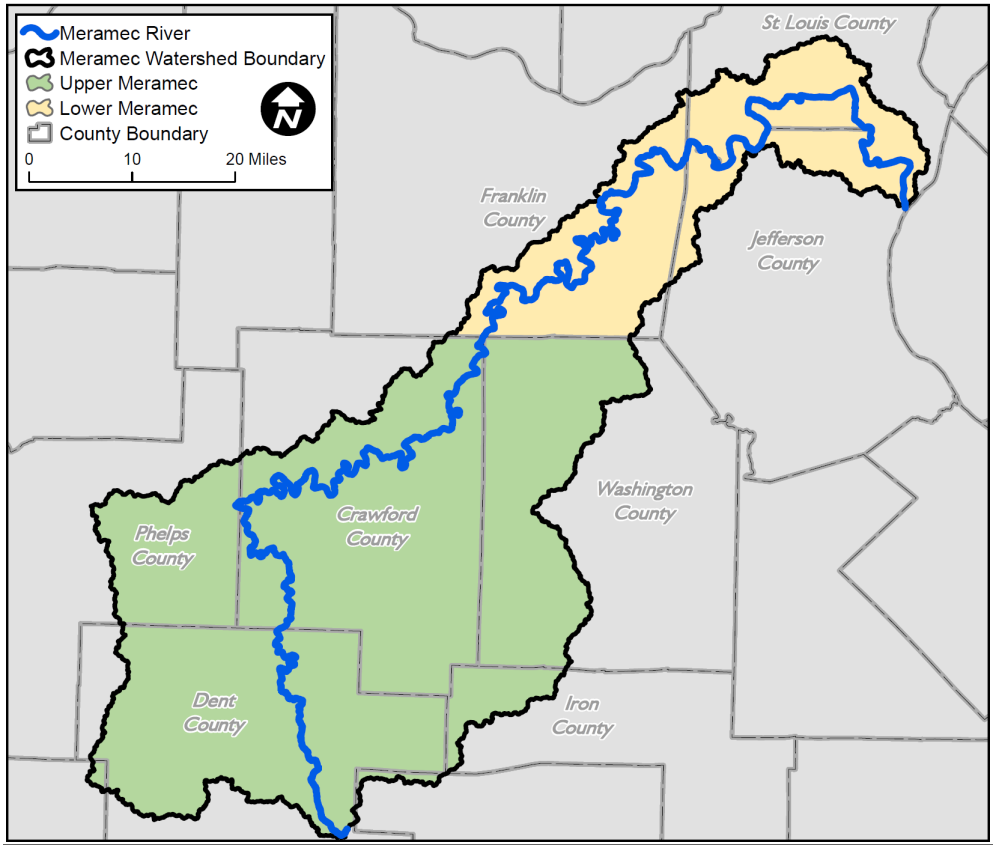
125 fish species and 47 mussel species

122 public drinking water systems



388 permits to discharge into the watershed

71 springs



Our Missouri WATERS

Meramec River Watershed

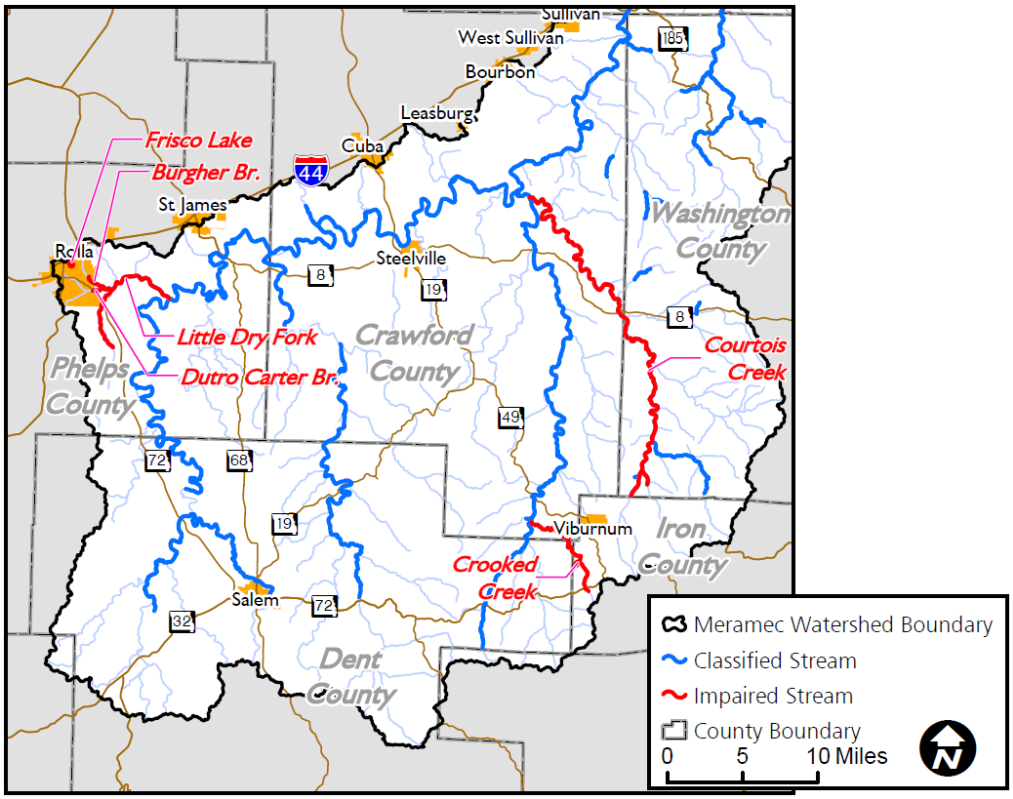
Planning for a Healthy Watershed

Water Quality

The watershed maintains a high level of aquatic diversity, and high quality streams are enjoyed by many residents and tourists. However, water quality is at risk in both the upper and lower portions of the watershed.

Water quality standards protect human health and provide for the beneficial uses of water for drinking, wading, swimming, and fishing, and for protecting aquatic life and other wild life. The federal Clean Water Act requires DNR to identify waterbodies that do not meet water quality standards. These are known as impaired streams or lakes. Based on monitoring data collected by DNR, both the upper and lower watersheds contain streams and lakes that are impaired. It is important to identify likely causes of the impairment and work together to resolve them– a key goal of OMW.

Impaired Streams — Upper watershed



Upper watershed streams	Impairment (as of 2016)	Source of pollution and impact
Burgher Branch	Low dissolved oxygen	Excess organic materials create challenges for aquatic life because they consume oxygen. Sources of the organic materials may be wastewater treatment systems, excess animal waste, excess nutrients from fertilizers and excess sedimentation from stream banks and nearby fields
Dutro Carter Creek	Low dissolved oxygen	
Little Dry Fork	Low dissolved oxygen	
Courtois Creek	Lead and zinc	Human consumption of fish containing sufficient quantities of lead or other heavy metals can result in health problems. Likely sources of the lead pollution are drainage from lead mine tailings piles and mining area activities.
Indian Creek	Lead and zinc	
Crooked Creek	Cadmium, copper and lead	
Frisco lake	Mercury in fish tissue	

Our Missouri WATERS

Meramec River Watershed

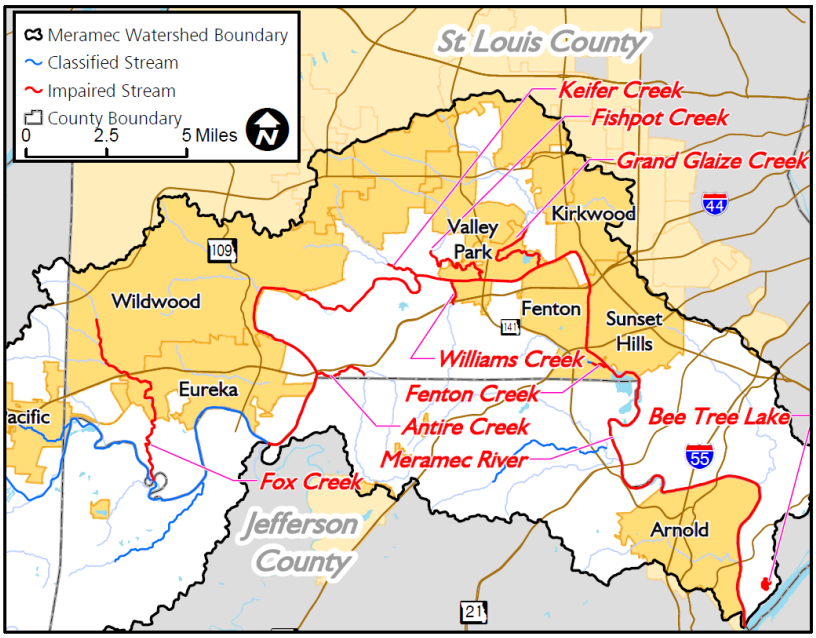
Planning for a Healthy Watershed

Water Quality

When a stream or lake is identified as impaired, DNR is required to declare what it will take to clean up the water body. This is often documented in a "Watershed Management Plan." **East-West Gateway Council of Governments** (EWG), the regional planning agency for the St. Louis region, prepared such a plan for the lower Meramec Watershed in 2012 and is updating the plan in 2016-2017. You can find out more about the plan update at www.ewgateway.org.

The Nature Conservancy developed the Meramec Basin Conservation Action Plan in 2014 and identified priorities for habitat protection and improvement. (www.nature.org/Missouri)

Impaired Streams — Lower Meramec



Lower watershed streams	Impairment (as of 2016)	Source of pollution and impact
Antire Creek	Bacteria and ph	Urban runoff into smaller streams has contributed to high levels of bacteria, chloride and mercury. **Bacteria** The presence of *E. coli* is an indicator that a potential health risk exists for individuals exposed to this water. *E. coli* may occur as a result of inadequate septic systems, the overflow of domestic sewage or nonpoint sources of human and animal wastes. **Chloride** Chloride in surface waters can be toxic to aquatic life. Chloride in ground and surface water comes from the use and storage of salt for de-icing roads, septic systems, wastewater treatment systems, water softening, animal waste, fertilizers, discharge from landfills, natural sources of salt and brine in geologic deposits, and from natural and human sources in precipitation. **Mercury** Mercury occurs in the environment through natural processes and human activity. The Missouri Department of Health has issued a Fish Consumption Advisory for mercury in largemouth bass throughout the state.
Fenton Creek	Bacteria	
Fishpot Creek	Bacteria and chloride	
Fox Creek	unknown	
Grand Glaize Creek	Bacteria, chloride, mercury in fish tissue	
Kiefer Creek	Bacteria and chloride	
Williams Creek	Bacteria	
Bee Tree Lake	Mercury in fish tissue	
Meramec River	Lead	

Our Missouri WATERS

Meramec River Watershed

Planning for a Healthy Watershed

Healthy Watershed Engagement Process

As part of the OMW approach, in 2015 and 2016, EWG and Meramec Regional Planning Commission (MRPC) invited local government officials, Soil and Water Conservation District (SWCD) board members, sewer and water district representatives, the Missouri Farm Bureau and other interested organizations to participate in interviews and meetings to identify issues, concerns and opportunities in the Meramec watershed. Participants shared perspectives and possible next steps to help improve water quality and the overall health of the watershed. The process also led to the organization of a Watershed Advisory Committee in the lower Meramec to enable ongoing discussion and problem solving with local community members and organizations.

Meetings by the numbers

107 people interviewed

6 community meetings:

⇒ October 7, 2015 Lower Meramec meeting at Powder Valley Nature Center

⇒ October 13, 2015 Upper Meramec meeting at St. James

⇒ December 3, 2015 Watershed-wide meeting at Meramec Caverns

⇒ February 26, 2016 Lower Meramec meeting at Pacific

⇒ April 13, 2016 Upper Meramec meeting at Wurdack Farm

⇒ April 27, 2016 Watershed-wide meeting at Meramec State Park

250 meeting attendees

Focus Areas

The topics in these two tables emerged as reoccurring themes throughout the interviews and meetings and will remain a focus throughout ongoing discussions with the Watershed Advisory Committee and Soil and Water Conservation board members.

Topic	Issues	Recommended next steps
Roads, Bridges and Creek Crossings	Road infrastructure is a high-impact feature on the Meramec River Watershed. Local resources are insufficient to improve stream crossings to meet water quality and habitat protection standards. Run-off containing salt from de-icing roads contributes to streams impaired by chloride in the lower watershed.	• Continue research and education on alternative designs for low-water crossings and rural, gravel roads. • Explore solutions to fish passage barriers that exist on the Meramec and its tributaries. • Search for funding opportunities for county highway departments in the upper watershed to construct and maintain crossings and roads in a manner that protects wildlife habitat and water quality. • Build the capacity of local agencies to understand and navigate state and federal permitting processes. • Work with local groups to protect recreational and trail river crossings. • Research and promote best practices for alternatives to the use of road salt for de-icing in the lower watershed where streams are impaired by chloride.
Sewers, Treatment Plants, Septic Systems, Drinking Water	Costs are too high for small sewer districts to meet new standards to protect and improve water quality. Individual treatment systems are a significant contributor to streams impaired by bacteria because drain fields are inadequate or owners do not maintain the system. In the lower watershed untreated urban runoff is the main contributor to degraded water quality.	• Work with cities and sewer districts to find (and fund) creative solutions to meet water quality standards from sewage treatment. • Work with cities and sewer districts to hook individual properties with on-site sewage treatment to public or more efficient treatment facilities. • Work with counties to implement inspections of individual treatment systems when property changes ownership. • Promote the use of low impact development and green infrastructure to reduce the impact of urban runoff on water quality. • Engage large utility providers regarding the exchange of information on large, future projects

Our Missouri WATERS

Meramec River Watershed

Planning for a Healthy Watershed

Tourism and Recreation	Tourism and recreation are major economic drivers, but the growing demand for access to the river is resulting in conflicts between visitors and local landowners and degradation of the river due to heavy use.	• Continue to educate the public on the function of a watershed. Develop a common sense of ownership of the Meramec River as a regional resource. • Use OMW as a forum to develop collaborative relationships between landowners, floaters, power-boaters, outfitters, farmers, etc. • Discuss with landowners and river-based businesses options for providing more restroom facilities along the river. • Engage canoe outfitters open to further collaboration to protect water quality. • Tie river activities in to the Historic Route 66 experience. • Explore opportunities to incorporate technology into tourism and recreation activities. • Promote eco-tourism. • Continue to develop the Ozark Trail and other trails throughout the region.
Agriculture and Resource Use	Agriculture and resource extraction are also major land uses and economic drivers in the watershed. These activities, if not managed properly, can cause streams to be impaired by low-dissolved oxygen levels, and can lead to soil erosion and runoff.	• Cultivate partnerships and foster ownership and pride in the entire Meramec River Watershed among all residents, businesses, landowners and visitors. • Work with famers, SWCDs and other producer organizations to increase use of sustainable agricultural practices. • Hold tours of private property to showcase successful best management practices that protect water resources and benefit local landowners. • Form a partnership with University of Missouri to increase the use of Wurdack Farm for group tours to encourage the expansion of best management practices. • Explore options and opportunities to harvest river gravel in a manner that is not damaging to the environment. • Partner with material extractors to partner on solutions to minimize impacts on the environment and water quality during operations and maximize habitat and recreational opportunities when operations close. • Support Naturally Meramec to increase agri-tourism in the watershed. • Assist advocacy groups to increase understanding of the food system in general and increase local consumption of goods produced in the watershed. • Work with state and federal agencies to make government programs easier for farmers and landowners to understand, navigate and use to install BMPs on their land. • Explore options for winter cattle feeding operations.
Natural Resources, Habitat and Wildlife	The quantity and quality of the natural environment in and adjacent to the river influences all of the other categories. While having a totally 'wilderness' environment is not possible, a balance must be maintained between natural areas and areas in active use to achieve the greatest benefits for all involved.	• Engage the Forest Service to learn about and influence their management of public forests in the watershed. • Coordinate with landowners in the lower watershed to encourage contiguous patches of wildlife habitat. • Document best practices for stream bank protection and promote a natural, vegetated buffer along the river. • Preserve the wide variety of species in the watershed and restore areas of biodiversity degraded by human development . • Prevent further encroachment of invasive species. • Engage organizations such as "Grow Native" for further information and technical assistance.
Flooding and Flood Mitigation	The flooding of December 2015 along the Meramec River was of historic proportions. Flooding is impossible to prevent, but damage from flooding is possible to manage. Mitigating future damage from floods will be most effective if approached from the perspective of the entire Meramec River Watershed.	• Assist and contribute to US Geological Services' flood inundation mapping program. • Explore, discuss and promote floodplain management techniques that minimize damage and cost to recover from floods. • Develop a campaign to discourage future filling and construction in the natural floodplain. • Collaborate with initiatives in other regions and watersheds to influence policy on floodplain management.

Meramec River Watershed

Planning for a Healthy Watershed

Forums for Ongoing Collaboration

In addition to identifying issues to focus on, the community engagement process also identified forums that can be used to discuss issues and solutions as part of the Our Missouri Waters approach to watershed management. The table below outlines these forums which are specific to each portion of the watershed.

Upper watershed	Lower watershed	Whole watershed
Soil and Water Conservation Districts (SWCDs) elect board members by county, and provide information, technical support and cost-share programs to operations and landowners regarding best management practices to improve production, habitat, and water quality. The board members from each district, along with local government officials from the counties, will convene joint meetings to discuss issues in the upper watershed that cross district and county boundaries. This will serve as an effective, on-going engagement conduit for the Our Missouri Waters initiative in the upper Meramec watershed.	**The Meramec River Recreation Association (MRRA)** formed in 1975 to protect the Meramec River and its watershed from Sullivan to its confluence with the Mississippi in order to preserve the river and its surrounding area in its natural state with careful utilization of its recreational, aesthetic, educational and economic potential for the benefit of the public. The MRRA by-laws provide board membership for each of the cities, and the three counties in the lower watershed, for citizen representation and for representatives from "agencies having the authority to own or manage recreational or conservation lands" on the lower half of the Meramec. At its meeting on May 12, 2016 the MRRA voted to act as a Watershed Advisory Committee for the lower Meramec River.	The SWCDs, MRRA, East-West Gateway Council of Governments and the Meramec Regional Planning Commission will form a partnership to host an annual watershed- wide meeting to bring interested parties together from both the upper and lower portions to discuss issues and look for solutions to long term problems as part of the Our Missouri Waters initiative throughout the whole watershed.

Other Ways to Get Involved

Open Space Council for the St. Louis Region leads Operation Clean Stream on the Meramec River and organizes other volunteer efforts to plant trees, remove honey suckle and involve and educate the public. (www.openspacestl.org/get-involved)

Great Rivers Greenway District offers volunteer opportunities to help restore and beautify the greenways along the Meramec River corridor. (greatriversgreenway.org/)

Naturally Meramec Consortium meets regularly with ranchers, farmers, wine-producers, restaurant owners, lodging entities, etc. to promote local products and agri-tourism in the region. (Missourimeramecregion.org)

Missouri Stream Teams organize river clean up campaigns and collect data on water quality. (www.mostreamteam.org)

The Ozark Trail Association is working in the watershed to develop, maintain, preserve, promote, and protect the rugged natural beauty of the Ozark Trail (www.ozarktrail.com)

The Meramec River Tributary Alliance works towards creating a common vision for the Meramec River Basin. The group meets 2-3 times per year to collaborate on projects throughout the watershed and is coordinated by The Open Space Council and The Nature Conservancy. (www.openspacestl.org/meramec-river-tributary-alliance/)

Soil and Water Conservation Districts

To find your county's SWCD board members visit www.swcd.mo.gov

Meramec River Recreation Association

Website: look for the MRRA on Facebook

Our Missouri Waters

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Website: www.dnr.mo.gov/omw

Meramec Regional Planning Commission
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Website: www.meramecregion.org

East-West Gateway Council of Governments
Email: info@ewgateway.org
Phone: 314-421-4220
Website: www.ewgateway.org

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