South Creek Restoration:

Clean Water = A Healthy, Vibrant Community

South Creek • History of an Urban Stream

According to locals, South Creek was a popular fishing spot in the 1970s with bluegill, sun perch, and snapping turtles. By the mid-1980s, the one-mile stretch between Campbell Avenue and Kansas Expressway along Sunset Street had been converted to a concrete channel, a common way of managing streams at the time. We now know that protecting and restoring streams to a more natural condition contributes to a healthy, vibrant community in many ways.

Do you know where the rain goes?

When it rains in nature, soil and vegetation act like sponges that soak up rainwater. In a city, there is less vegetation and the soil is covered up by "impervious" roads, rooftops, and parking lots that don't allow rainwater to soak in. Rainwater that doesn't soak in is called stormwater runoff. Storm drains carry runoff directly into streams such as South Creek. Along its way, stormwater runoff picks up pollutants such as dirt, motor oil, litter, yardwaste, and lawn chemicals. These pollutants impact water quality in our streams and lakes. Reducing lawn fertilizer, disposing of yardwaste and trash properly, planting trees and rain gardens, and using rain barrels are ways you can help reduce the amount of stormwater and pollution reaching our streams. Report pollution to streets, storm drains, or streams by calling 864-1010.

Where Does South Creek Begin and End?

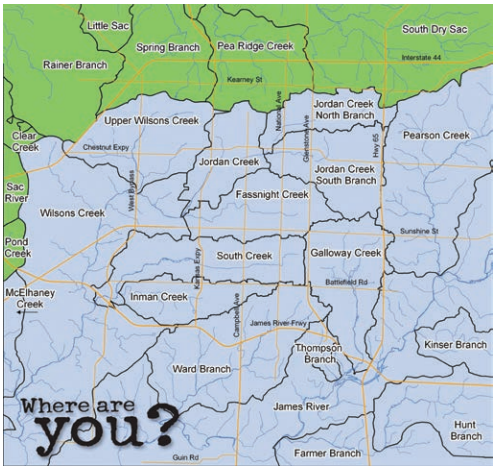
The area of land that drains into a body of water is called a watershed. South Creek's watershed begins near Meador Park and the Battlefield Mall. The creek itself starts at McDaniel Park at the corner of National Avenue and Sunset Street and flows west into Wilsons Creek. From there, Wilsons Creek flows south into the James River which flows into Table Rock Lake. Table Rock Lake flows into the White River which flows into the Mississippi River and then the Gulf of Mexico.

My watershed address:

South Creek
Wilsons Creek
James River
Table Rock Lake
White River
Mississippi River
Gulf of Mexico

Mississippi River Basin Map

SPRINGFIELD WATERSHED MAP



Sac River Watershed

James River Watershed

BEFORE

AFTER

Restoration: Clean Water for People and Wildlife

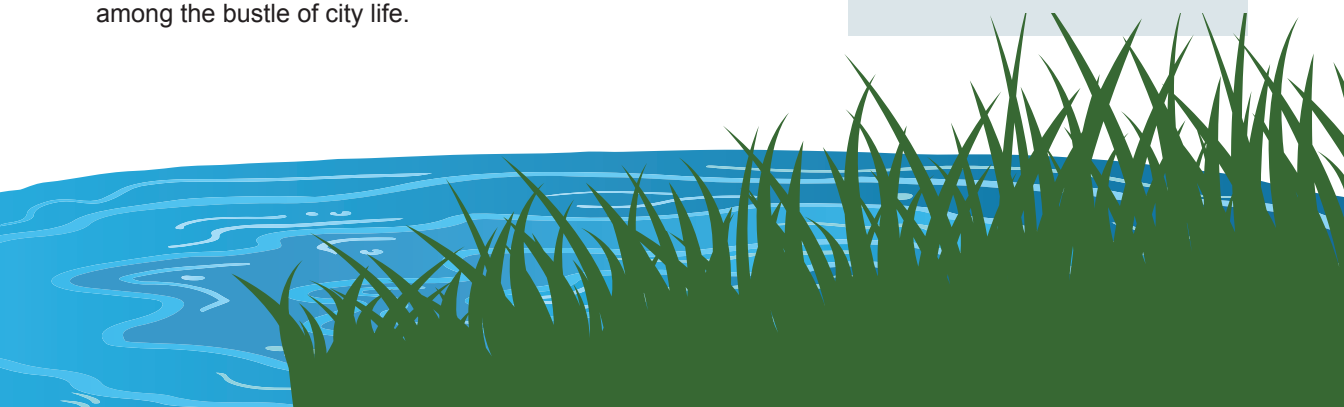
In 2015, South Creek between Campbell Avenue and Kansas Expressway was restored to a more natural condition by removing the concrete channel and adding meandering pools, riffles, rocks, and logs typical of an Ozarks stream. Natural, healthy streams are better for water quality than concrete channels because they are able to filter pollutants through natural processes. The goal of the restoration project was to improve water quality and habitat for aquatic life while enhancing the area as a linear park for users of the existing South Creek Greenway Trail.

This stretch of South Creek is now a place where thriving native plants cleanse the water and provide habitat for birds and butterflies. Small fish and other aquatic life feed and take shelter among the rocks. People enjoy a little piece of nature among the bustle of city life.

Urban Stream Safety:

Here are some common sense safety tips to enjoy our urban streams:

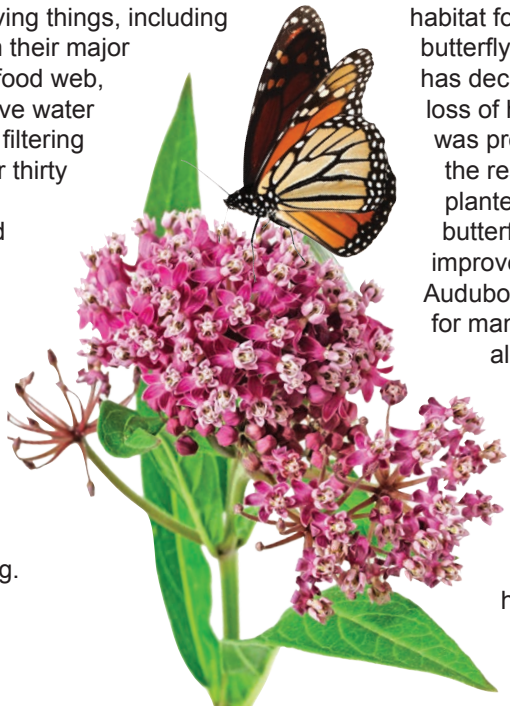
- Wear shoes in and around streams.
- Don't wade in fast or high water.
- Wait at least 24 hours after a rain event before water contact.



Monarch butterfly on a swamp milkweed plant.

Native Plants, Food, and Clean Water

Prior to wide-spread human settlement, the Ozarks was characterized by certain species of plants that naturally grew here. These “native” plants are best adapted to our local climate and soils and provide food for native insects who in turn provide food for native birds and other animals. This food web is essential for the survival of all living things, including people. Aside from their major contribution to the food web, native plants improve water quality by naturally filtering out pollutants. Over thirty species of native plants were planted throughout the restoration project to benefit wildlife, improve water quality, and beautify our community. To learn more about Missouri native plants, visit www.grownative.org.



Butterflies and Birds

Prior to the restoration project, much of the area along the creek was mowed grass with the exception of the area between Fort Avenue and Kansas Expressway that was typically too wet to mow. An important native plant called swamp milkweed was growing in abundance in this wet, un-mowed area. Milkweed provides necessary habitat for the lifecycle of the Monarch butterfly. The Monarch butterfly population has declined significantly worldwide due to loss of habitat. Much of the swamp milkweed was preserved along South Creek during the restoration and more milkweed was planted. In addition to improving habitat for butterflies, the restoration project has also improved bird habitat. The Greater Ozarks Audubon Society has been volunteering for many years to improve bird habitat along the creek upstream of the restoration project. Their bird surveys identified 12 species of birds in the restoration area. Butterflies, bees, birds, and other animals help to pollinate plants to produce fruit and fertile seeds. Without pollinators visiting our gardens, we wouldn’t have any fruits and vegetables to eat.

What Does the Science Tell Us?

Streams are full of small organisms called macroinvertebrates that live in the rocks and sediment along the bottom of the stream. Macroinvertebrates are important water quality indicators and can tell us a lot about the health of a stream. Certain species are sensitive to pollution and will only survive in a clean, oxygen-rich environment. Streams that are polluted or lack habitat usually have a low number and diversity of macroinvertebrates. James River Basin Partnership and Missouri Stream Team volunteers collected macroinvertebrates in South Creek before and after the restoration. Five locations in South Creek were sampled, including three locations in the restoration area, one location upstream, and one location downstream. Using the Missouri Stream Team protocol, a water quality rating was calculated based on the types of macroinvertebrates present. The water quality rating for two of the three locations in the restoration area improved from "poor" to "good" or "excellent". Healthy populations of macroinvertebrates are important because they consume algae and other organic matter such as leaves and sticks, helping to keep the water clean. They are also an important source of food for fish, frogs, and birds.

Macroinvertebrate sampling before the restoration.

The Return of Fish

Since the restoration, the fish that were prevalent in the 1970s have started to return. Common Ozark species include sunfish, largemouth bass, and stoneroller minnows.

Longear sunfish

Trees and You

Over 100 native trees were planted throughout the restoration project. Trees provide many benefits for people and wildlife. Trees are especially important along streams where they provide shade to cool the water for fish and other aquatic life, and help to filter out pollutants in stormwater runoff. Planting trees at your home or business is one of the most important things you can do for a clean environment and a healthy community. How do trees improve your everyday life? Do they make it more pleasant to walk through your neighborhood or provide a shady spot to park your car? Do they improve the view out your window?

Design and Maintenance Corner

A team of people from many different disciplines, including engineers, ecologists, geomorphologists, biologists, urban foresters, and watershed professionals, worked together to design this project. The combined knowledge and perspectives of this team proved to be very valuable in the success of this restoration project.

Structural design features include hardwood log weirs, Newbury weir rock riffles, plunge pools, creek rock (2-10 inches in size) and boulders (2-4 feet in size). The riffles, pools, and various sizes of rocks and boulders provide different types of habitat for aquatic life. Meanders simulating a natural stream were created between Grant Avenue and Fort Avenue, with turf reinforcement mat to protect the outer bends from erosion. The stream was kept in its existing straight formation upstream of Grant Avenue due to space constraints and downstream of Fort Avenue to limit disturbance of wetland vegetation. Underneath the bridges, channels were created in the culvert bottoms to increase the low flow water depth and connect the aquatic habitat upstream and downstream from each bridge. The disturbed areas as well as the areas of preserved wetland vegetation were drill seeded with a mix of 30 native plants. Along the greenways trail and the street, a border of turf grass was left in place to provide a defined edge for mowing and create an intentional look for the native landscape. At the outfalls of the approximately 40 stormwater pipes that enter the creek, concrete trickle channels were removed and shallow depressions were excavated, drill seeded, and stabilized with straw blanket. These vegetated depressions act like rain gardens, slowing down and absorbing stormwater runoff and associated pollutants. Over 100 native trees were planted to shade the stream and improve the riparian corridor.

Newbury weir rock riffle construction. The low flow channel constructed in the concrete under each bridge is visible in the foreground.

Log weir and newly planted trees.

Stormwater outfall before and after

A maintenance plan was developed to guide the establishment and maintenance of native plants and plan for future structural maintenance. In 2016, the first growing season, many native plants were already visible including large stands of bulrush along the water's edge, asters, and milkweed. Native plant maintenance activities in the first growing season included periodic mowing to control annual weeds and spot spraying and trimming of invasive plants including johnson grass, canary reed grass, and cattails. Control of weeds and invasive plants is crucial for establishment of native plants.

Trash: The Most Visible Form of Pollution

Trash from littering gets washed into South Creek and other Springfield streams when it rains. Trash is a major type of pollution that affects water quality and can be harmful to fish and aquatic life. It also makes our streams less attractive.

To volunteer for stream cleanups through the Adopt-A-Stream program, call 864-2087.

At a Glance:

The total project cost was approximately $1.1 million for construction and $140,000 for design. The project was made possible by a $765,000 federal water quality grant from EPA Region 7 through the Missouri Department of Natural Resources under Section 319 of the Clean Water Act. The required 40% match was provided through the ¼-cent Capital Improvements Sales Tax and the 2006 Springfield-Greene County Parks/Waterways Sales Tax, as well as in-kind staff time. In addition, the project received a $10,000 Community Conservation Grant from the Missouri Department of Conservation for native plant establishment.

For more information, visit:
www.springfieldmo.gov/stormwater
www.jamesriverbasin.com

MISSOURI DEPARTMENT OF NATURAL RESOURCES

JAMES RIVER BASIN PARTNERSHIP

CITY OF Springfield

- **Removed 1.2 acres of concrete**
- **Installed 14 hardwood log weirs and 9 Newbury weirs to create riffles and pools**
- **Added 115 tons of creek rock and 65 boulders for aquatic habitat**
- **Created 40 vegetated "rain garden" treatment areas at stormwater pipe outfalls**
- **Seeded approximately 8 acres with a mix of 30 native plants**
- **Planted 103 native trees**
- **Improved macroinvertebrate water quality ratings from "poor" to "good" and "excellent"**