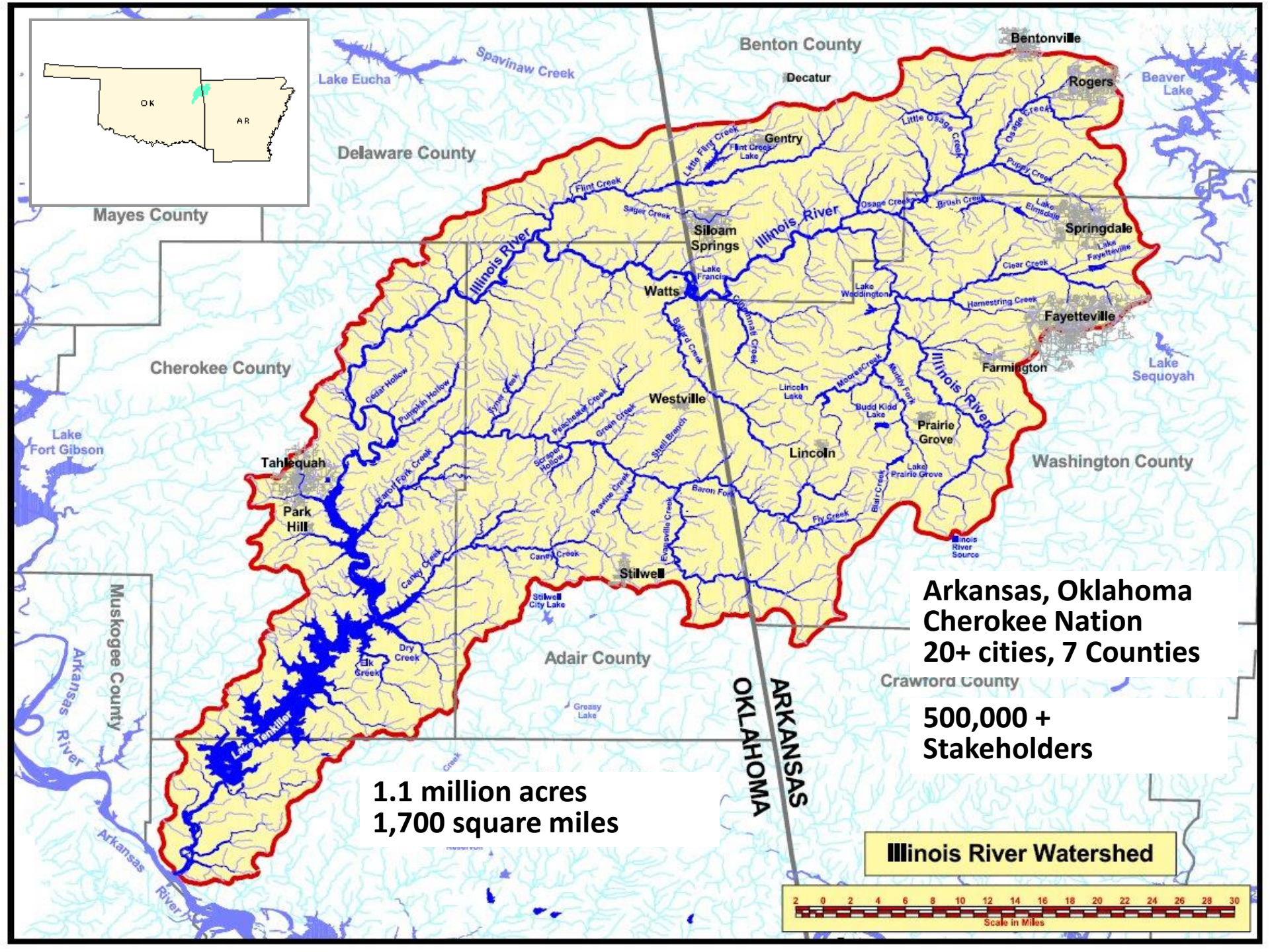
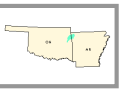
# Water Quality Demonstration & Educational Program for the Illinois River Watershed – Green Infrastructure

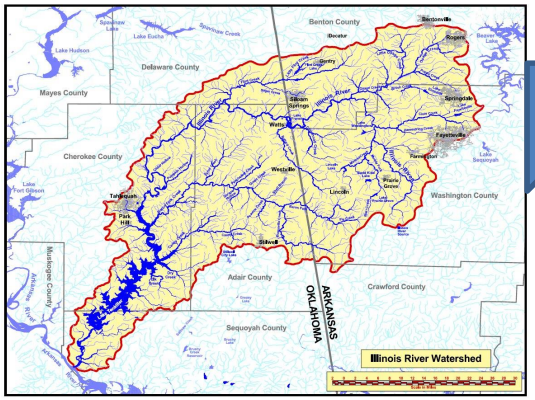
**Grant #13-300**

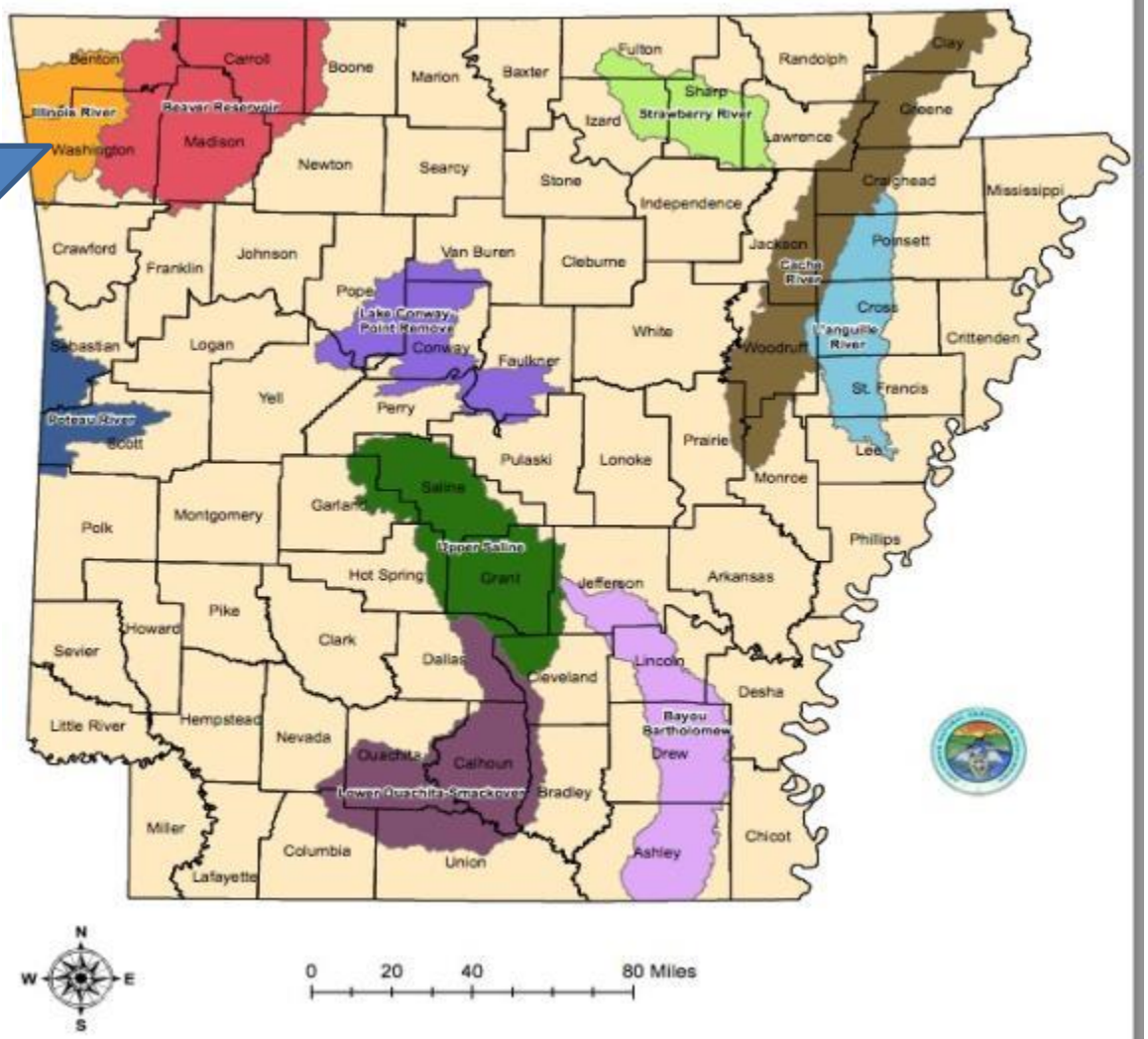
**Project Period:** July 1, 2013 – June 30, 2016

**2015** Nonpoint Source Pollution Stakeholder & Project Review Meeting


OK
AR
Benton County
Bentonville
Rogers
Beaver Lake
Lake Eucha
Spavinaw Creek
Decatur
Delaware County
Gentry
Flint Creek Lake
Little Flint Creek
Little Osage Creek
Osage Creek
Puppy Creek
Flint Creek
Sager Creek
Mayes County
Siloam Springs
Illinois River
Osage Creek
Brush Creek
Lake Elmdale
Springdale
Lake Fayetteville
Clear Creek
Lake Francis
Watts
Lake Weddington
Hamestring Creek
Fayetteville
Cherokee County
Ballard Creek
Osbornia Creek
Illinois River
Farmington
Lake Sequoyah
Cedar Hollow
Pumpkin Hollow
Flynn Creek
Westville
Lincoln Lake
Moore Creek
Muddy Fork
Budd Kidd Lake
Prairie Grove
Lincoln
Lake Fort Gibson
Peacheater Creek
Green Creek
Shell Branch
Scraper Hollow
Tahlequah
Washington County
Lake Prairie Grove
Baron Fork
Peavine Creek
Evansville Creek
Blair Creek
Fly Creek
Illinois River Source
Park Hill
Canfield Creek
Stilwell
Stilwell City Lake
Muskogee County
Arkansas River
Dry Creek
Elk Creek
Adair County
Crawford County
Greasy Lake
Lake Tenkiller
OKLAHOMA
ARKANSAS
Arkansas, Oklahoma
Cherokee Nation
20+ cities, 7 Counties
500,000 +
Stakeholders
1.1 million acres
1,700 square miles
Illinois River Watershed
2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Scale in Miles






# AR Priority Watershed: As Determined by ADEQ

ILLINOIS River
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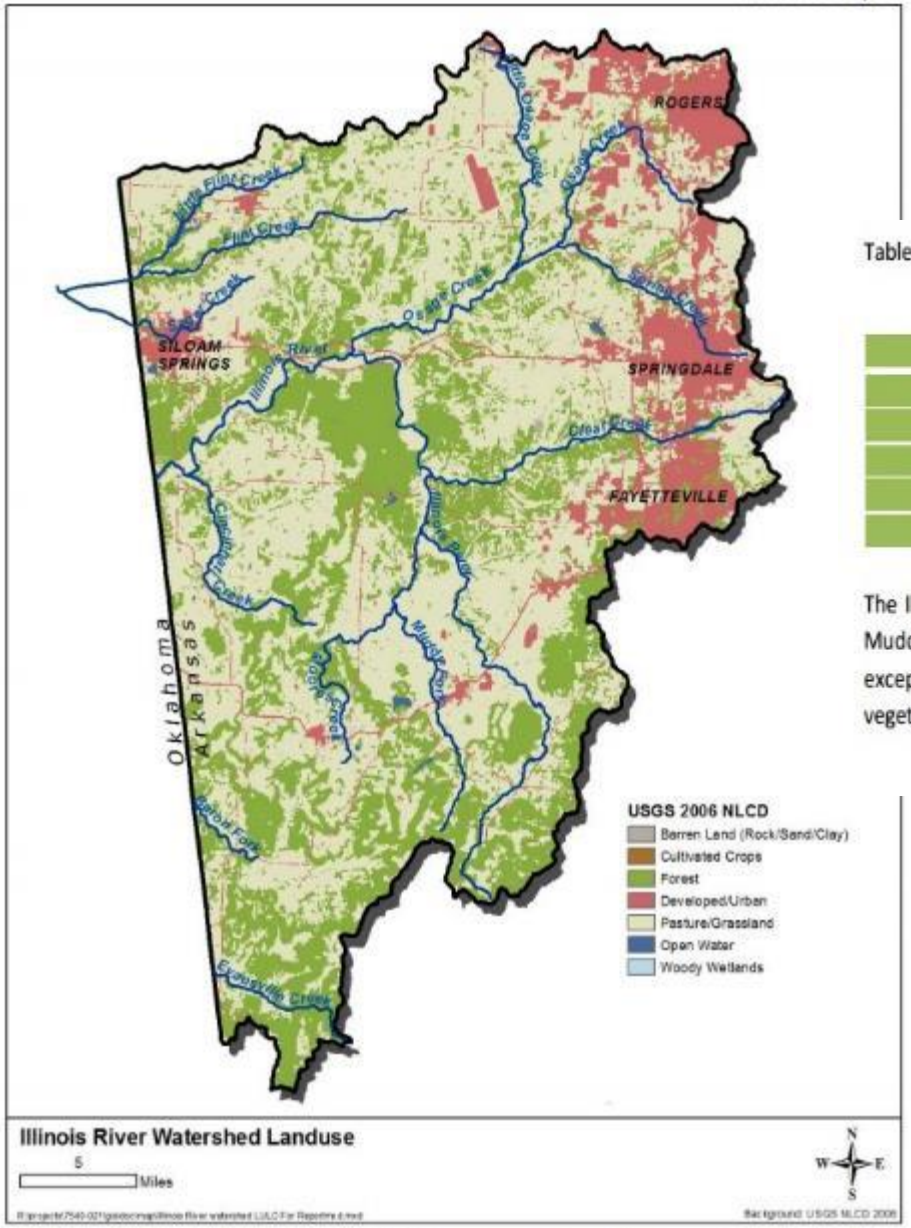
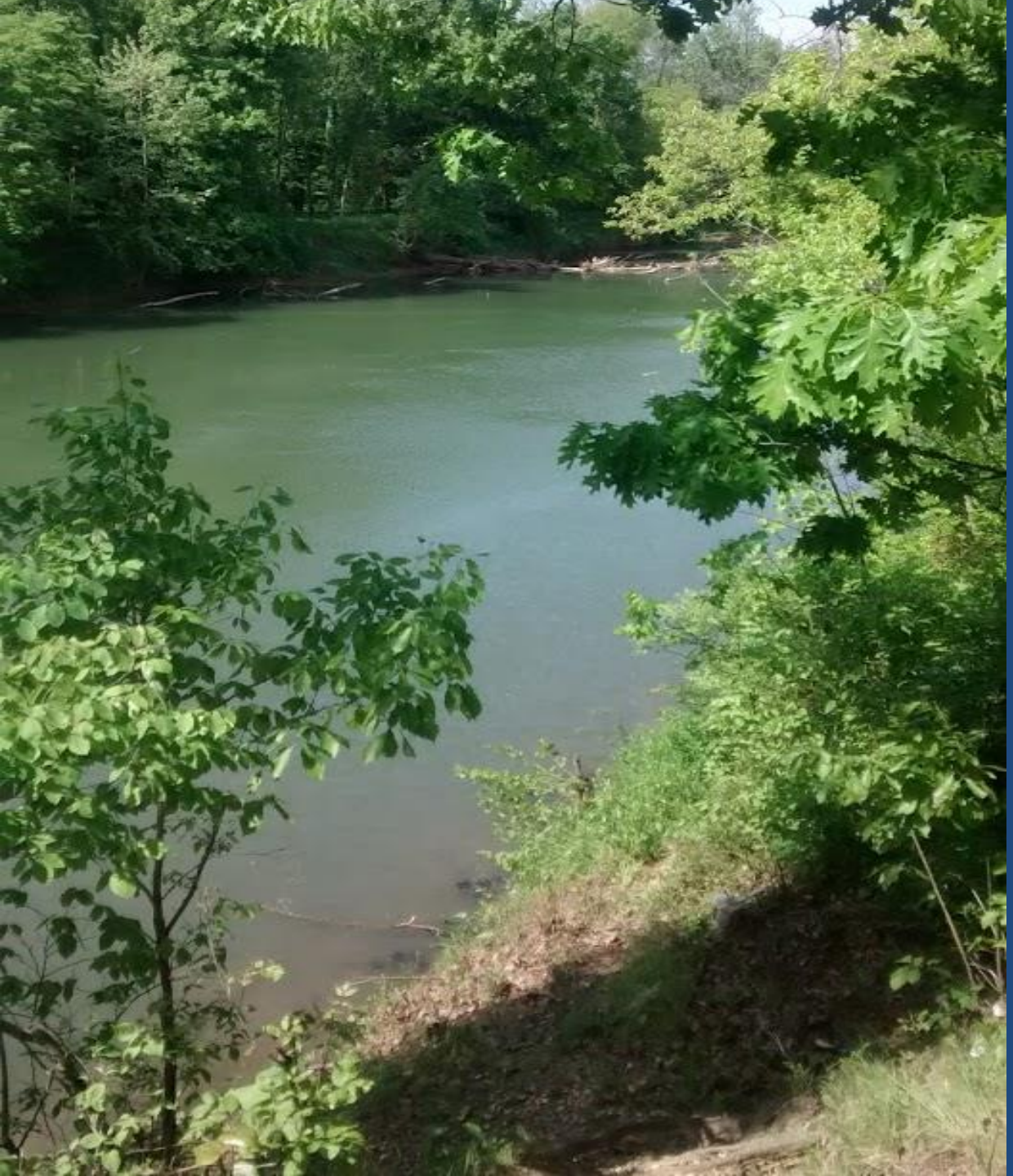



Figure 2.9. Land use distribution across the UIRW in northwest Arkansas (based on 2006 land use/land cover data).

Table 2.2. Summary of 2006 land use/land cover for the UIRW (from the Center for Advanced Spatial Technology).

| Land Use | Percentage of UIRW |
|---|---|
| Forest | 41% |
| Pasture | 46% |
| Urban | 13% |
| Row Crops | < 0.1% |
| Water | < 1% |

The Illinois River and its major tributaries in Arkansas (Osage Creek, Clear Creek, Baron Fork, and the Muddy Fork) exhibit a range of conditions, from areas with dense riparian forest buffers illustrating exceptional beauty and ecological value, to areas of exposed and eroding stream banks with no vegetated buffers.



# Illinois River

The Illinois River and its tributaries have many designated uses set forth by the Arkansas Pollution Control and Ecology Commission (APCEC):

- **Fisheries**
- **Primary and secondary contact recreation**
- **Drinking water supply**
- **Agricultural and industrial water supply**

However, portions of the Illinois River and its tributaries have been cited as not meeting these designated uses due to impairment from **bacteria, sediment, and/or nutrients.**

The goal of the watershed-based plan is to improve water quality in the Illinois River and its tributaries so that all waters meet their designated uses both now and in the future.

ILLINOIS River
WATERSHED PARTNERSHIP

November 30, 2012

Table 4.1. UIRW HUC12 priority watersheds based on approved and Arkansas 303(d) lists.

| Impaired Reach | Designated Use Impaired | 2008 Pollutant of Concern | 2010 Pollutant of Concern | 2012 Pollutant of Concern | HUC12 Name | Predominant Pollutant Source |
|---|---|---|---|---|---|---|
| Reaches Listed by ADEQ | | | | | | |
| 11110103-020 | Aquatic Life Fisheries | Sediment | Not listed | Not listed | Lake Frances – Illinois River | Surface Erosion |
| 11110103-023 | Primary Contact | Pathogens | Pathogens | Pathogens | Illinois River – Lake Wedington | Agriculture |
| 11110103-024 | Primary Contact | Sediment, pathogens | Sediment, pathogens | Sediment, pathogens | Illinois River – Lake Wedington | Sediment: Surface Erosion Pathogens: Agriculture |
| 11110103-025 | Primary Contact | Pathogens, total phosphorus | Pathogens | Pathogens | Lower Muddy Fork – Illinois River | Agriculture |
| 11110103-029 | Primary Contact | Pathogens | Pathogens | Pathogens | Lake Fayetteville – Clear Creek | Urban |
| 11110103-029 | Primary Contact | Pathogens | Pathogens | Pathogens | Little Wildcat – Clear Creek | Urban |
| 11110103-932 | — | Nitrate | Nitrate | Nitrate | Sager Creek | Municipal Point Source |
| Additional 2008 Segments Listed by EPA Region 6 | | | | | | |
| 11110103-013 | Primary Contact | Pathogens | Not listed | Not listed | Upper Baron Fork | Unknown |
| 11110103-027 | | Total phosphorus | Not listed | Not listed | Upper Muddy Fork – Illinois River; Lower Muddy Fork – Illinois River | Unknown |
| 11110103-028 | Primary Contact | Pathogens | Not listed | Not listed | Headwaters Illinois River, Goose Creek – Illinois River | Unknown |
| 11110103-030 | Primary Contact | Pathogens, total phosphorus | Not listed | Not listed | Osage Creek – Illinois River | Unknown |
| 11110103-930 | | Total phosphorus | Not listed | Not listed | Headwaters Osage Creek – Illinois River | Unknown |
| 11110103-933 | Primary Contact | Pathogens | Not listed | Not listed | Little Osage Creek | Unknown |
| 11110103-931 | Primary Contact | Pathogens, total phosphorus | Not listed | Not listed | Spring Creek – Osage Creek | Unknown |
| Swepco Lake | Aquatic Life | Unknown | Unknown | Unknown | Middle Flint Creek | Unknown |

# Impaired Stream Reaches

# 303d List 2008

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# Impaired Stream Reaches

EPA Accepted Watershed - Based Management Plan 2012

There are about 1,100 miles of streams in the UIRW, and about 103 miles of impaired streams are caused by these pollutants, or about 10% of the total number of stream miles.

About 91 stream miles are impaired by pathogens, 4 stream miles impaired by sediment, and 8 stream miles impaired by nitrate.

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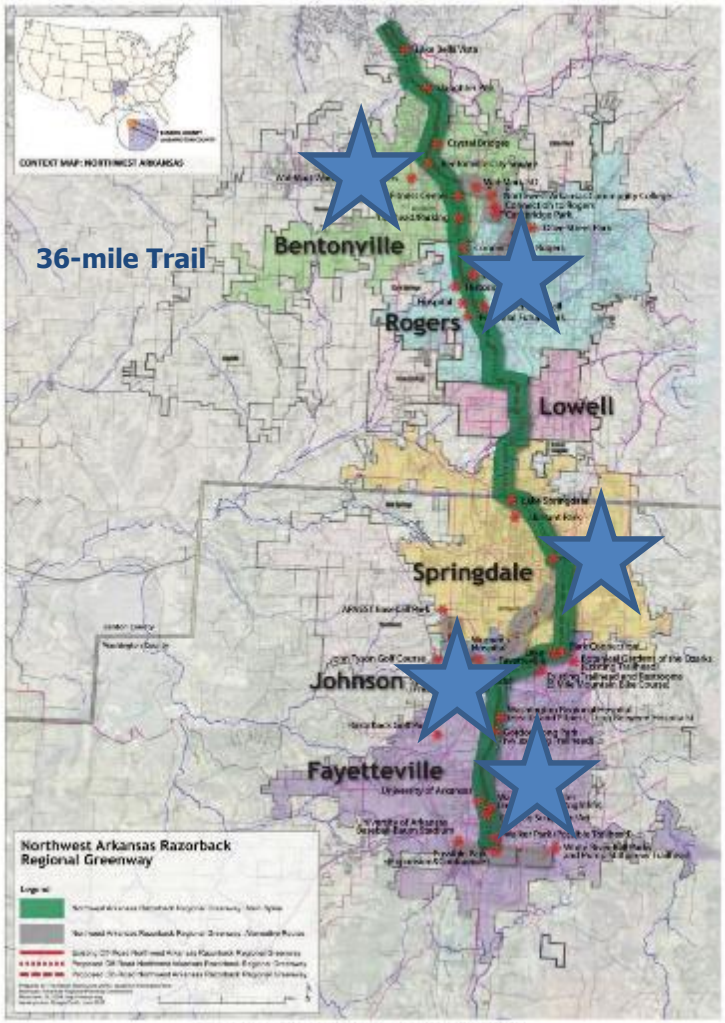


Northwest Arkansas Razorback Regional Greenway

**Pictures provided by Razorbackgreenway.com**

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# Green Infrastructure Grant 13-300

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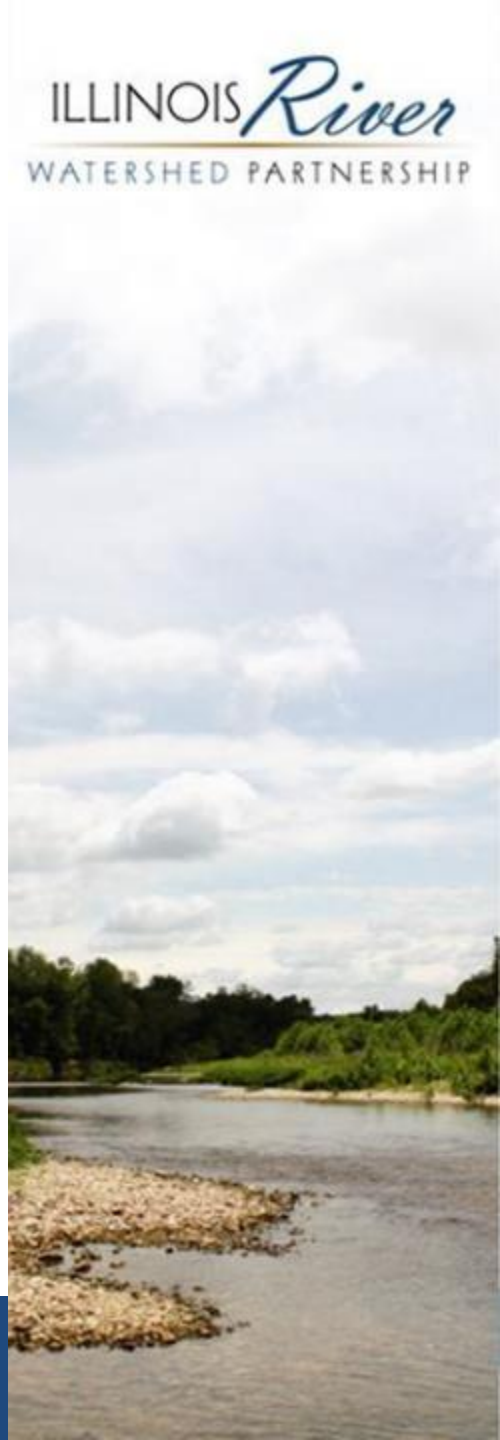
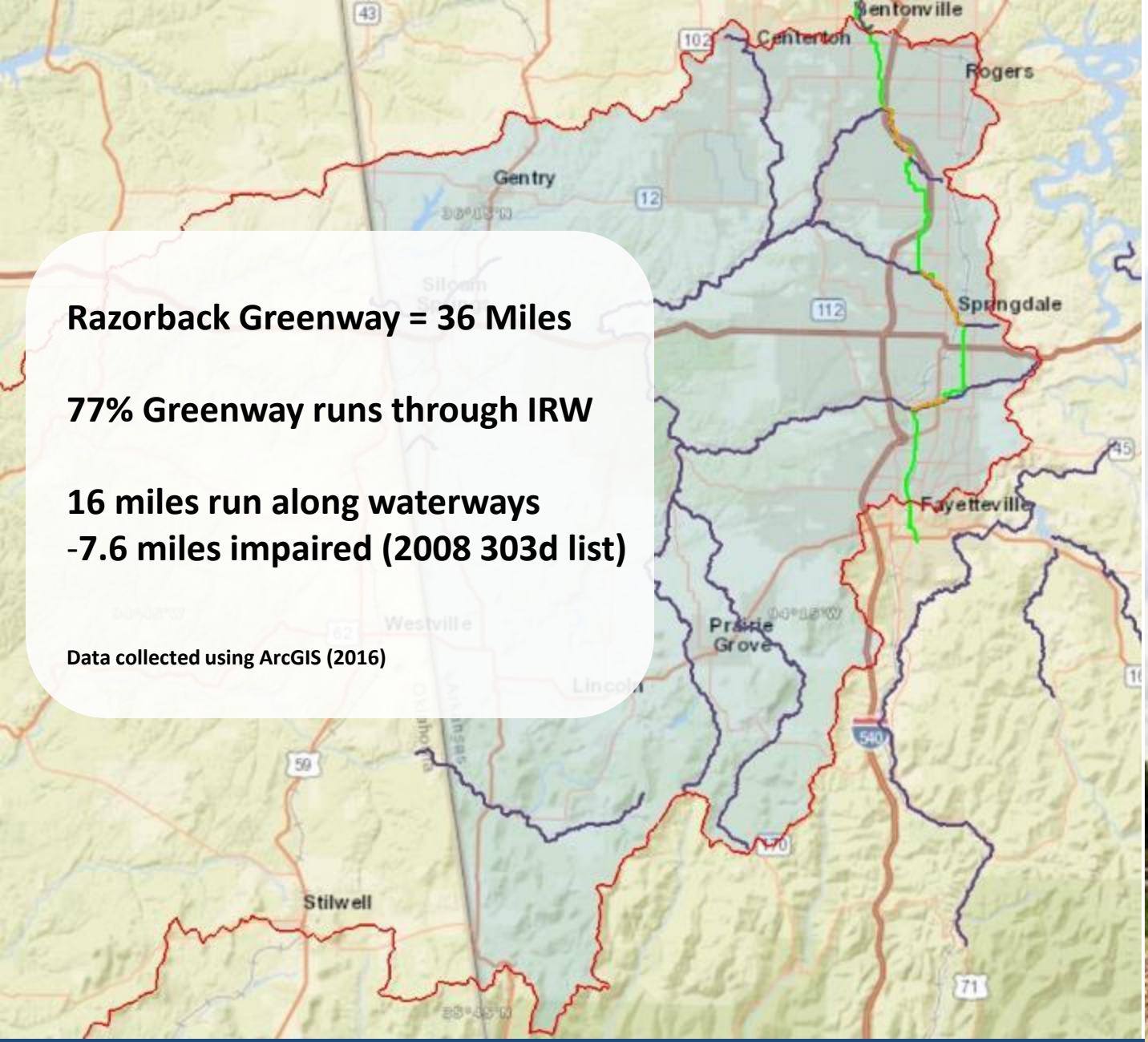
Project Goals:

**Design and build** at least five green infrastructure projects to improve water quality.

**Educate and encourage** communities to implement such practices on their property and change behaviors that contribute to water pollution and improvement of water quality.



## Green Infrastructure Grant 13-300




**Razorback Greenway = 36 Miles**

**77% Greenway runs through IRW**

**16 miles run along waterways**
**-7.6 miles impaired (2008 303d list)**

**Data collected using ArcGIS (2016)**

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# Green Infrastructure Grant 13-300

Mercy Trailhead area
Weekly Avg: 664

Lake Springdale
Weekly Avg: 594

Crystal Bridges/Amazeum
Weekly Avg: 2,370

Gordon Long Park
Weekly Avg: 1,560

Johnson/Scull Creek
Weekly Avg: 1,407

2015 Annual Trail Use
http://www.waltonfamilyfoundation.org/our-impact/home-region/nwatrails


# Amazeum, Bentonville, AR

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ILLINOIS River
WATERSHED PARTNERSHIP

# Amazeum, Bentonville, AR

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Sam Dean @scimachine · Jul 6
Rain garden doing its job.... Plants coming in nicely... @amazeum

2 9

**Denise Firmin Garner** added 13 new photos — with Bob Arvin and 4 others at Amazeum.
July 14 · Bentonville

Beautiful morning for a rain garden dedication! Thank you Illinois River Watershed Partnership for your help on keeping the #Amazeum property sustainable...


Like Comment Share

Illinois River Watershed Partnership, Josh Siebert, Becky Christenson and 49 others

2 shares 2 Comments

**Ella Dean** Wonderful project. Would like to see it in Ohio.
Like · Reply · 1 · July 14 at 3:52pm

# Amazeum, Bentonville, AR

ILLINOIS River
WATERSHED PARTNERSHIP

## SCOTT FAMILY AMAZEUM, IRWP COLLABORATION MITIGATE POLLUTANTS

Amazeum | Comments

# Amazeum, Bentonville, AR

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"Great things happening here! We just surpassed our **250,000th** guest this year (July-June), far surpassing what we originally planned. And the museum is alive with voices and laughter. We recently hosted the Girl Scouts to have a special time for science exploration themselves - see some photos below.

We also see a number of people (a) riding bikes up here from area homes and (b) launching off from here to hit the trails. Thank you so much for helping us to integrate the museum into the great things along the greenway." - Sam Dean

# Amazeum, Bentonville, AR

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## Project Highlights:

7,700 SF of rain gardens to capture water from roof.

10,535 SF Bioretention area with of floodplain wildlife mix incorporated to treat parking lot runoff.

2,975 Native Plants planted.

120 Native Trees planted.

Educational signage installed.

# Mercy Trailhead, Rogers, AR

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# Volunteer Tree Plantings at Mercy

ARKANSAS FORESTRY COMMISSION

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Award: Small projects winner and Grand Conception Award in the Water Resources category, selected by American Council of Engineering Companies of Arkansas

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# Mercy Trailhead, Rogers, AR

ILLINOIS River
WATERSHED PARTNERSHIP


# Mercy Trailhead, Rogers, AR

ILLINOIS River
WATERSHED PARTNERSHIP

## Project Highlights:

5,400 SF of impervious area treated by a 1,800 SF bioswale.

531 native plants planted.

18 native trees planted at parking lot site.

400 Square yards of native grass area sod.

2 community events at trailhead with 975 participants.

**Mercy Trailhead, Rogers, AR**

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WATERSHED PARTNERSHIP

# Additional Conservation Projects:


Mercy Hospital Partnership established to continue to work on phases of riparian restoration along their urban properties that border the Razorback Greenway and headwater ephemeral streams of Osage Creek.

935 linear feet riparian restored with 400 Native tree seedlings.

**Mercy Trailhead, Rogers, AR**

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# City of Johnson Trailhead, Johnson, AR

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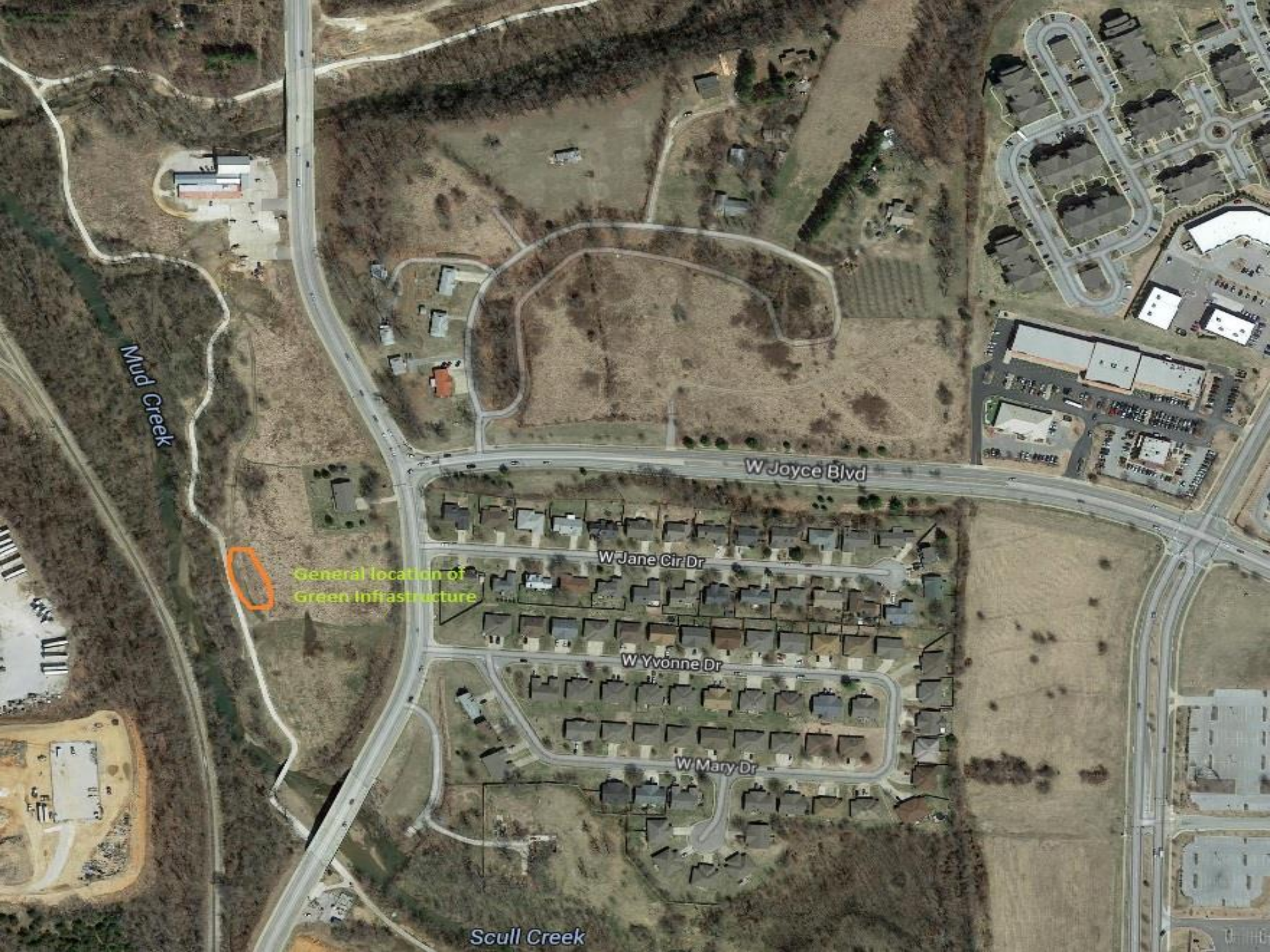
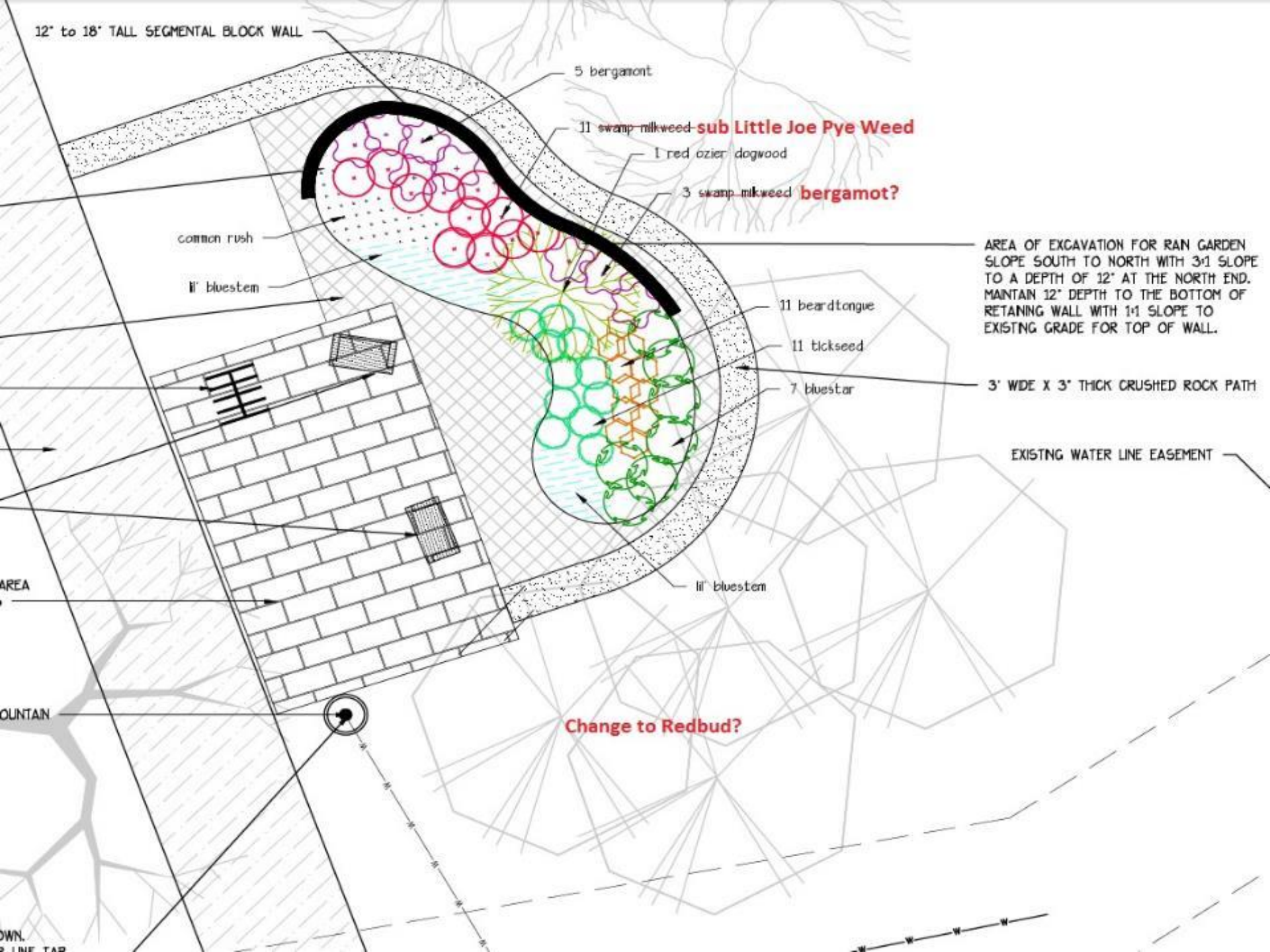
WATERSHED PARTNERSHIP


Mud Creek
W Joyce Blvd
W Jane Cir Dr
General location of
Green Infrastructure
W Yvonne Dr
W Mary Dr
Scull Creek


12" to 18" TALL SEGMENTAL BLOCK WALL
5 bergamont
11 swamp milkweed sub Little Joe Pye Weed
1 red ozier dogwood
3 swamp milkweed bergamot?
common rush
lil' bluestem
AREA OF EXCAVATION FOR RAIN GARDEN SLOPE SOUTH TO NORTH WITH 3:1 SLOPE TO A DEPTH OF 12" AT THE NORTH END. MAINTAIN 12" DEPTH TO THE BOTTOM OF RETAINING WALL WITH 1:1 SLOPE TO EXISTING GRADE FOR TOP OF WALL.
11 beardtongue
11 tickseed
7 bluestar
3' WIDE X 3" THICK CRUSHED ROCK PATH
EXISTING WATER LINE EASEMENT
lil' bluestem
Change to Redbud?

# Johnson Trailhead, Johnson AR

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WATERSHED PARTNERSHIP

# Johnson Trailhead, Johnson AR

ILLINOIS River
WATERSHED PARTNERSHIP

# Johnson Trailhead, Johnson AR

ILLINOIS River
WATERSHED PARTNERSHIP

## Project Highlights:

- 445 Square foot rain garden installed.
- 136 native plants installed in rain garden.
- 12 Native trees (1-2” caliper) installed in partnership with the Arkansas Forestry Commission.
- 240 square feet of pervious pathway installed.
- 600 square feet of pervious pavers installed.
- Educational signage installed.

132 people contributed 252 volunteer hours (Clean Ups).
7 additional native trees (1-2” caliper) planted along Clear Creek.

**Johnson Trailhead, Johnson AR**

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# Johnson Trailhead, Johnson AR

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# Lake Springdale Trailhead, Springdale, AR

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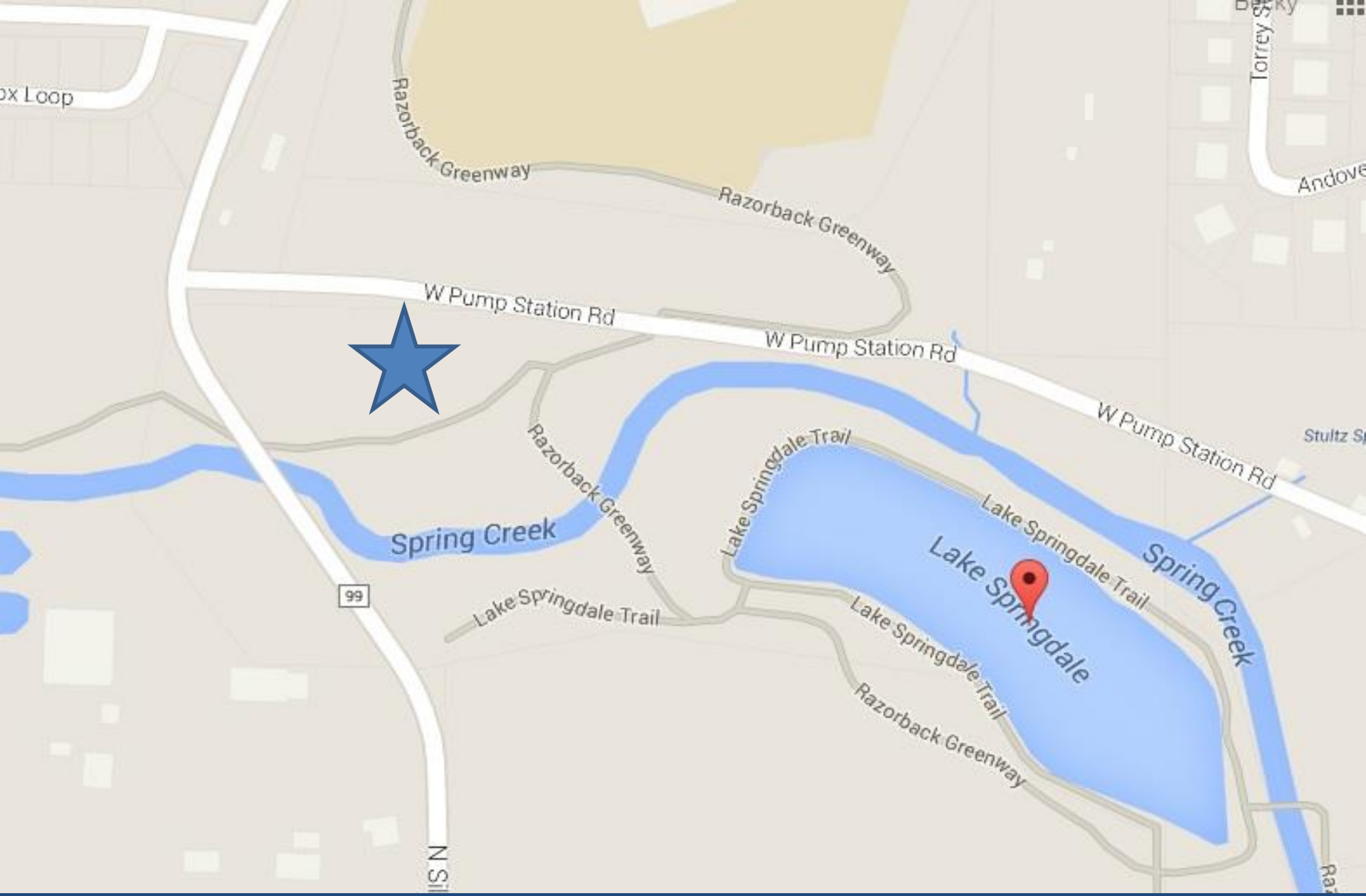
WATERSHED PARTNERSHIP




# Lake Springdale Trailhead, Springdale, AR

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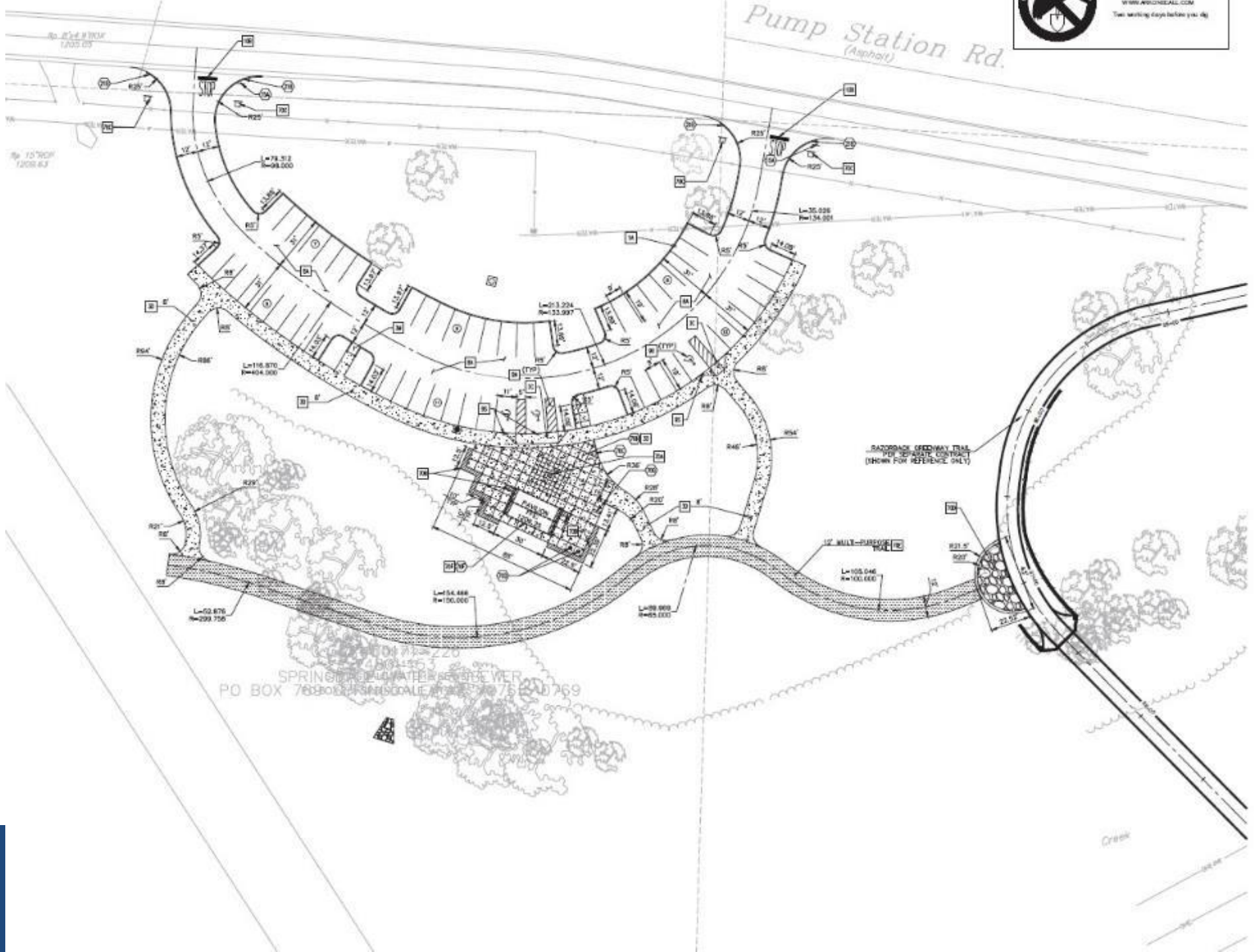
Pump Station Rd.
(Asphalt)
SPRINGBROOK WATER SERVICE
PO BOX 769
SAZORBACK GREENWAY TRAIL
PER SEPARATE CONTRACT
(SHOWN FOR REFERENCE ONLY)
12' MULTI-PURPOSE TRAIL
PAVILION
Creek

# Lake Springdale Trailhead, AR

ILLINOIS River
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# Lake Springdale Trailhead, AR

ILLINOIS River
WATERSHED PARTNERSHIP

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WATERSHED PARTNERSHIP

# Lake Springdale Trailhead, Springdale, AR

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In addition to the trailhead improvements, IRWP is working with 13 EAST (Environmental and Spatial Technology) groups from the Springdale School District to use GIS software to map areas of the Razorback Greenway that connect near waterways to prioritize and plan riparian restoration projects. Lake Springdale/Spring Creek was identified as a priority area to work to restore riparian. IRWP obtained permission from the City of Springdale and since have planted over 1,000 linear feet of urban stream with grasses grown by Springdale EAST students in their classroom and native tree seedlings grown at IRWP tree farms.

# Lake Springdale Trailhead, AR

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April 2016

September 2016

# Lake Springdale Trailhead, AR

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WATERSHED PARTNERSHIP

# Project Highlights:

4,000 SF impervious parking area draining to a 2,500 square feet bioswale.

649 native plants installed to filter and treat parking lot runoff.

33 native trees planted in partnership with the Arkansas Forestry Commission, City of Springdale, Kawneer, Springdale EAST and IRWP.

1,000 native grasses planted at riparian area,
300 tree seedlings planted from IRWP tree farm,
along 250 linear feet of streambank.

Educational signage installed at Trailhead.


# Gordon Long Park, Fayetteville, AR

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# Gordon Long Park, Fayetteville, AR

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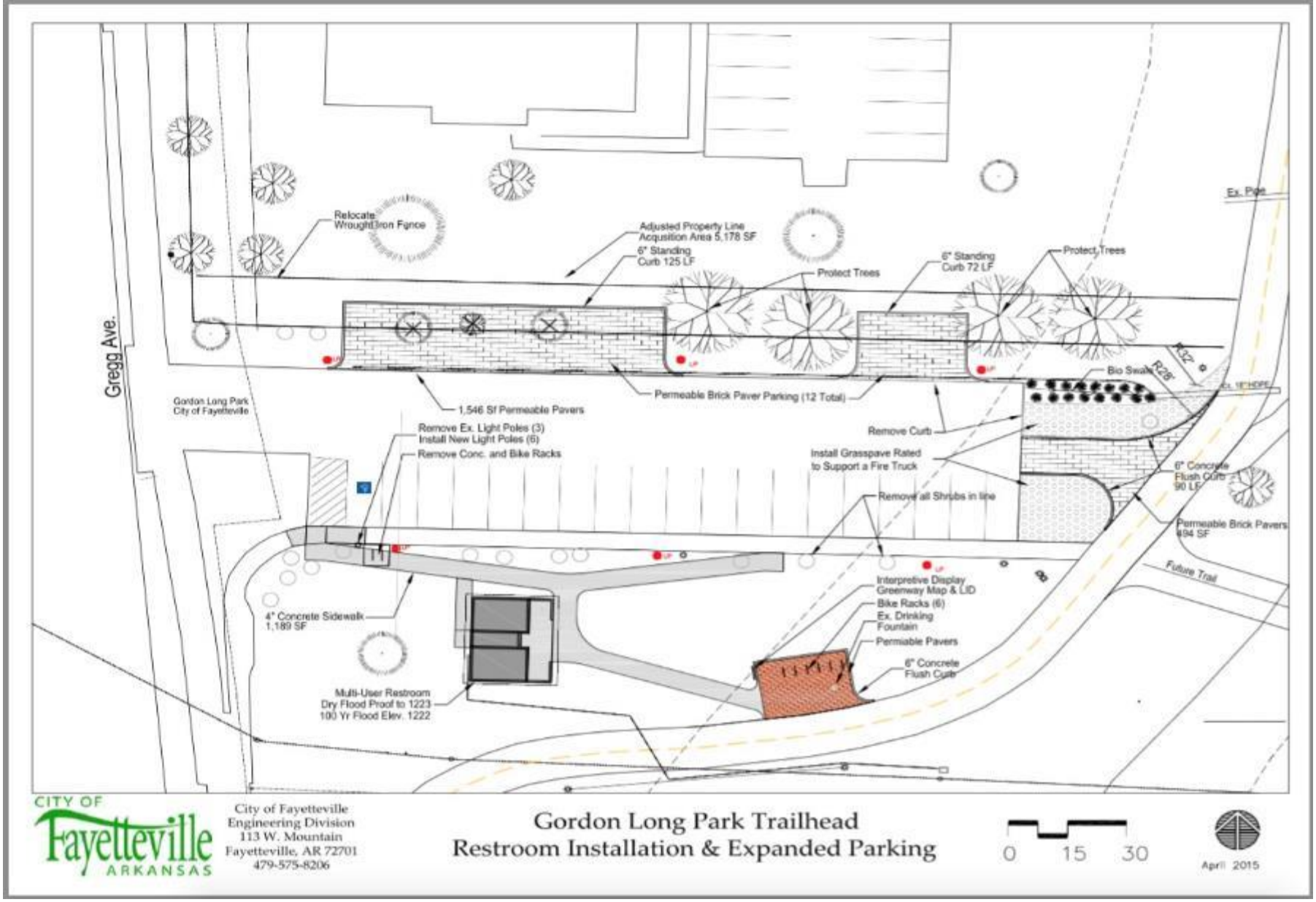
WATERSHED PARTNERSHIP




# Gordon Long Park, Fayetteville, AR

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ILLINOIS River
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# Gordon Long Park, Fayetteville, AR

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# Project Highlights:

12 Parking spots designed with 1,546 SF of pervious pavers.

894 square feet of additional pervious pavers installed.

600 square feet of grass pavers.

90 linear feet of flush curbs.

5,178 square feet of land acquisition by City of Fayetteville.

390 square foot bioswale installed.

50 native plants and 3 trees planted.

Permeable paver demo cube and educational signage installed.

96 volunteer contributed 179 hours to conduct creek clean ups at Scull Creek.

## Gordon Long Park, Fayetteville, AR

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# Gentry Pocket Park, Gentry, AR

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# Educational Signage

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Public Education and Outreach efforts have helped to raise awareness and promote Green Infrastructure within the Illinois River Watershed.

Information / Education /Awareness from 2013 – 2016 :

12,707 participants

71 Field Days

37 Training Sessions

39 Events

113 Outreach Meetings

Efforts continue to reach the public through campaigns, events and programs within the Illinois River Watershed.

# Educational Signage

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