

Connecting NPS Management to Receiving Streams through BMP Education and Demonstration

#15-900

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UA System Division of Agriculture Cooperative Extension



CITY OF
FAYETTEVILLE
ARKANSAS



Objectives

- Oct. 2015 – Oct. 2018 (orig. June 2018)
- Increase public awareness of storm drain infrastructure and urban non-point source pollutant impacts on water quality
- Connect land-use actions to water quality of receiving streams through public engagement

Implementation Methods

- Storm drain inlet filter demos
- Whisker demos
- LID demonstrations
- Ballot Bins



NWA Storm Drain Filter Demonstrations

- this is an educational *tool* to provide awareness in a unique way – *a different angle*
- Show types of urban pollutants entering local creeks
- experiment with maintenance and demonstrate pre-treatment



Locations

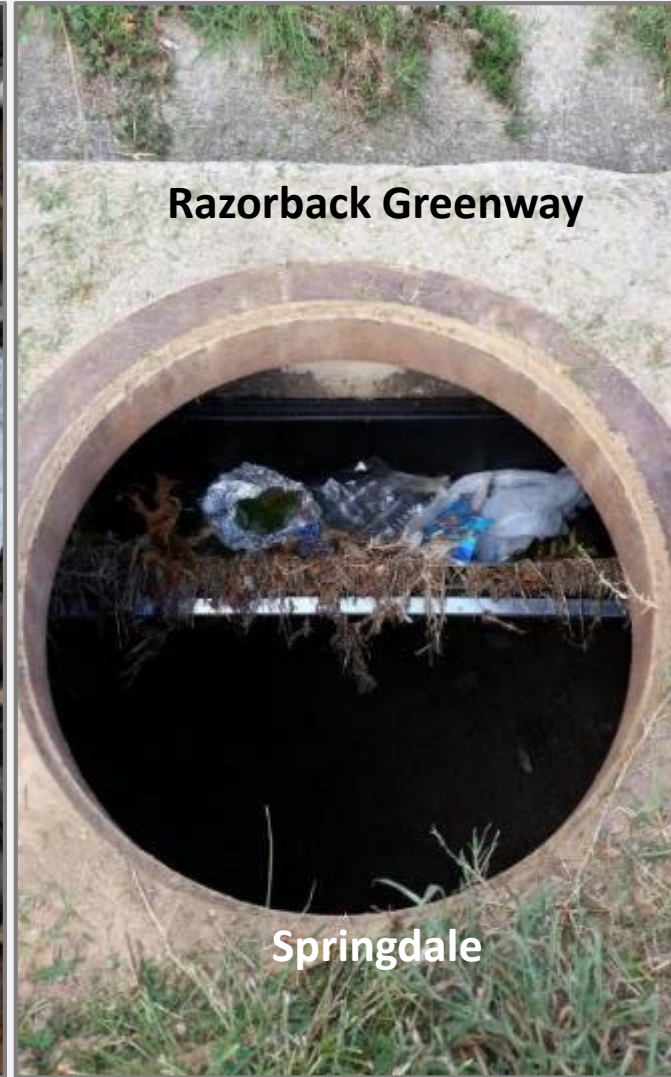
Fayetteville Entertainment District



Fayetteville – Walker Park
– Public Library



Razorback Greenway



Springdale

Pollutant Filter Results



Whisker Demonstration



- Visualize pollutant path
- Connect drain to outfall
- Interactive engagement

Ballot Bins

- Interactive engagement
- “ownership” of action
- Social Media
- Tangible results
- Local demand for expansion
 - 10 additional bins for local businesses



“I have seen a marked improvement at the worst areas since the installation of the bins. Now that patrons recognize the shape and color, I feel the usage will continue to improve at additional locations.”

– Joey Lewis – Parking Maint.

FAYETTEVILLE FLYER
NEWS, ART & LIFE IN FAYETTEVILLE, ARKANSAS

HOME NEWS & VIEWS ART, PRINTS & LIFE COLUMNS & FEATURES SPORTS

CLUBS & HOUSING NEWS & OPINION NEWS & OPINION

Locals install 'Ballot Bins' to limit cigarette butt litter

By Dustin Barthelemy 1 Comment November 3, 2017



One of the Ballot Bins recently installed in the Downtown Green Entertainment District

GreenWaterNW @greenwaternw

@FYYgov @FayParksAndRec 13 pounds of cigarette butts collected #cleanups & #ballotbin on the way to be #Recycled @TerraCycle #neatsstreets



11:10 AM · 18-Nov-2017

17 Friends · 8 Likes

From: Kimberly Rowe
Sent: Friday, August 25, 2017 11:09 AM
To: Colin Massey
Subject: Re: Facebook post

Hi Colin,
Here are the latest stats on it. Totally amazing! I looked back as far as could look and this post exceeded the popularity of our former highest performing post by double! And that was when Emerald Ash Borer was first discovered. You've really got something special here. Thanks for what you're doing.

80,357 people reached Boost Post

380 15 Comments 417 Shares

Like Comment Share

What this doesn't show is the actions (clicks) and that's at 17,300, WAY over and above anything we've ever posted.

Kimberly Rowe
Program Associate
U.A. DIVISION OF AGRICULTURE RESEARCH & EXTENSION
University of Arkansas System

50° 5:35 #NWArchie

CIGARETTE BALLOT BINS

FAYETTEVILLE

- CAN BE FOUND IN THE ENTERTAINMENT DISTRICT
- ANSWER THE QUESTION BY TOSSING IN CIGARETTE
- KEEPS THE CITY STREETS CLEAN




University of Arkansas Division of Agriculture - Extension (UAEEX)
Pop Likes August 2, 18

Like Comment Share

391 417 Shares 15 Comments

View 9 more comments

Jessieha Metzgerpa Young Mc...
Like Reply August 7 at 10:17am

Chesawee Crislander Blog Dry
Like Reply August 13 at 4:05pm

Ryan Chance James Pittman... we could build these bins and put them around the shop at 1400 E. Flory
Like Reply August 10 at 10:00am

Meg DeJankov Gabe Fleming
Like Reply August 10 at 7:26pm

David Hicks Great Staff
Like Reply August 12 at 10:00am

Katie Folsom Gonyea Hines
Like Reply August 12 at 11:40am

Friend Requests See All

Mary Beth Sanders
15 mutual friends
Add as Friend






STORM DRAINS

like the one below, flow directly to local

WATER WAYS

Carrying **POLLUTION** such as litter, sediment or chemicals





This inlet filter demonstration is helping raise awareness to prevent pollution

See what can get caught in this storm drain by following **#DrainsToCreek**







U of A
DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Fayetteville First Thursdays 2016 & 2017



Technology Transfer

Presentations:

- Washington Co. Cattlemen's
- Dickson St. Merchant's Assoc.
- Butterfield Trail Village
- Shiloh Museum Summer Camp
- Washington Elementary Summer Camp
- Fayetteville Kiwanis
- Arkansas Water Resources Conference & Walking Tour of 4 educational demos
- Fayetteville Lion's Club
- Fayetteville Environmental Action Committee



Outreach & Engagement

Litter Removal:

- (3) Pack Rat Outdoor Center (Gregg St. & Sublett Creek)
- (4) UA Rock Camp Freshmen
 - (2) Urban Trails
 - (2) Urban Cigarette Butt
- (2) Make-A-Difference Day Cleanups



Fayetteville Entertainment District

Cigarette butt cleanups

2016 – 11 lbs

2017 – 13 lbs



August: University of Arkansas Rock Camp 2016 & 2017

“I would have never even thought about this as a problem had I not seen it myself” – Rock Camp Student



Low Impact Development Demonstrations



URBAN FORESTRY
Springdale bioswale controls and cleans runoff
 by Allan Kirby

Ariston's natural forests cover over 19 million acres and contain 1.4 billion trees. As Arizona's urban areas grow, resulting in more impervious surfaces, there is a need to protect forests and, when necessary, replace them. Our company uses mulch, tree pits, and tree boxes to help to reduce home values, water disposal, and clean up our jobs to make a difference. The Arizona Forestry Commission (AFC) has been able to fund several projects with grant assistance, which allowed the City USA community to apply for and be awarded with funds to plant trees and improve low-impact areas.

In the long-term City USA community of Springdale, AFC was able to provide our work grant for the public works department and the University of Arkansas Department Extension Service (UACES) to create a bioswale project. It involves an landscape element designed to intercept or remove silt and pollution from surface runoff water. The purpose of a bioswale and biofilter is to absorb, collect, and treat stormwater runoff. Effectiveness of bioswales grows with increased contact time between soil and stormwater. Bioswales also become more effective with increased vegetation cover. This bioswale was installed last year.

The Springdale plan was to create a demonstration bioswale project to show the benefits of this system. First, the location identified. Stormwater runs off from the parking drop-off center and the city's Public Works Department yard into existing off-site. The bioswale was designed to screen stormwater through an amended soil mix planted with native trees, shrubs, grasses, and flowering perennials. During rain events, runoff temporarily pools in the U-shaped stone catch basin on the basin and then quickly infiltrates the bed. The basin and plants reduce and slow the stormwater and remove silt and other pollutants coming from nearby roads and pavements. The long residence time allows most of the water to filter into native soil. During large storm events, excess stormwater is collected in a perforated pipe surrounded by a gravel layer along the bottom of the filter bed and slowly released to the storm drain system at the edge of the city's property and into Spring Creek, a water tributary in the El Paso River Watershed.

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CITY & COUNTY



Washington County Cooperative Extension Service agent Katie Teague said, "This project is a great demonstration of green infrastructure and showcases the ways urban trees can not only provide shade, habitat and food for birds and beneficial insects, but also help with runoff filtration and stormwater uptake."

The hope behind the bioswale project is to promote public awareness and education. An interpretive sign will describe the function and benefits of the basin and its native trees to the high volume of residents visiting the recycling center. This sign will also be posted outside of the engineering office in city hall.

The design and construction also enhanced the technical skills of the Engineering and Public Works staff. Springdale leadership strives to improve the municipal stormwater management and pledges to use their employees to guarantee successful tree and plant establishment and maintenance of this bioswale. Maintenance includes watering (in times of no rain) mulching, and removal of silt and trash over time. City employees with various departments will use this educational tool during their annual stormwater training piloted by UACES.

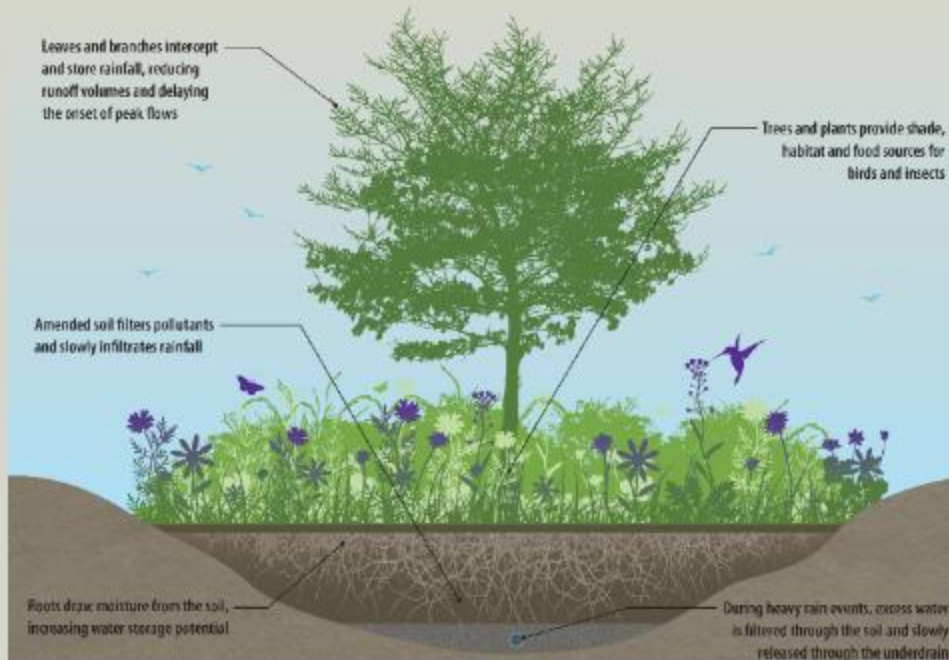
Manage Runoff with Green Infrastructure

BIORETENTION DEMONSTRATION

This bioretention basin intercepts stormwater runoff from 1½ acres of Springdale Public Works' property. The basin is planted with native trees, shrubs, grasses and perennials that filter potential pollutants from roofs, concrete pads, pavement and equipment in the yard. The plants take up more stormwater than the previously grassed area. In the bottom of the basin, a gravel-lined trench with an underdrain releases water slowly before it drains to Spring Creek, a major tributary in the Illinois River Watershed.

BENEFITS OF BIORETENTION

- Enhance water quality by filtering pollutants from stormwater
- Protect waterways from intense stormwater flows during storms
- Increase water infiltration and recharge groundwater supplies
- Reduce flooding and drainage problems
- Provide wildlife habitat for birds, butterflies and beneficial insects



Some Plants Used In This Bioretention Basin



Unique Plant Name
Unique plants



Unique Plant Name
Unique plants



Unique Plant Name
Unique plants



Unique Plant Name
Unique plants



Unique Plant Name
Unique plants

GREEN INFRASTRUCTURE

Green Infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits whereas conventional piped stormwater drainage systems (gray infrastructure) is only designed to move urban stormwater away from the built environment.

Green infrastructure techniques include: Urban Trees, Bioretention, Green Roofs, Permeable Pavements, Rain Gardens, Bioswales, Rain Barrels and Cisterns, Land Conservation

WHAT YOU CAN DO

You can help manage stormwater runoff at home by using these techniques that collect, slow and spread rainfall to help in soak in closer to where it falls:

- Plant native trees that thrive on typical rainfall
- Redirect downspouts onto grasses areas
- Use decks, pavers or mulch to provide open spaces for rain to soak in
- Install and use rain barrels
- Establish rain gardens

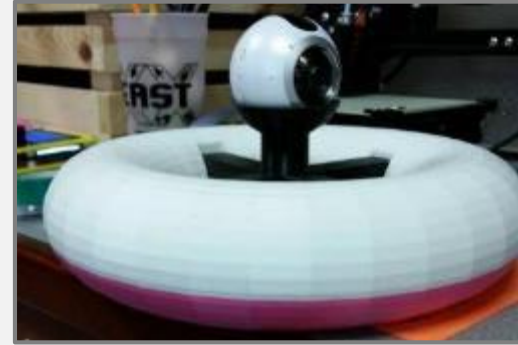
Upcoming for 2018

- Implement LID demonstration in Fayetteville
- Finalize pollutant path video media
- Complete match requirements

Estimated Project Total To Date

Total Hours	\$ Value	\$ Other Value In Kind	Total
1555	\$37,218.12	\$755.10	\$37,973.22

goal	Difference
\$57,359.00	\$19,385.78



Project Partners



- Engineering - Utilities
- Transportation & Public Works
- Parks and Recreation
- Office for Sustainability and Resilience
- GIS



- Planning & Community Development (Engineering)
- Public Works
- Water Utilities

Vendors

