

# 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

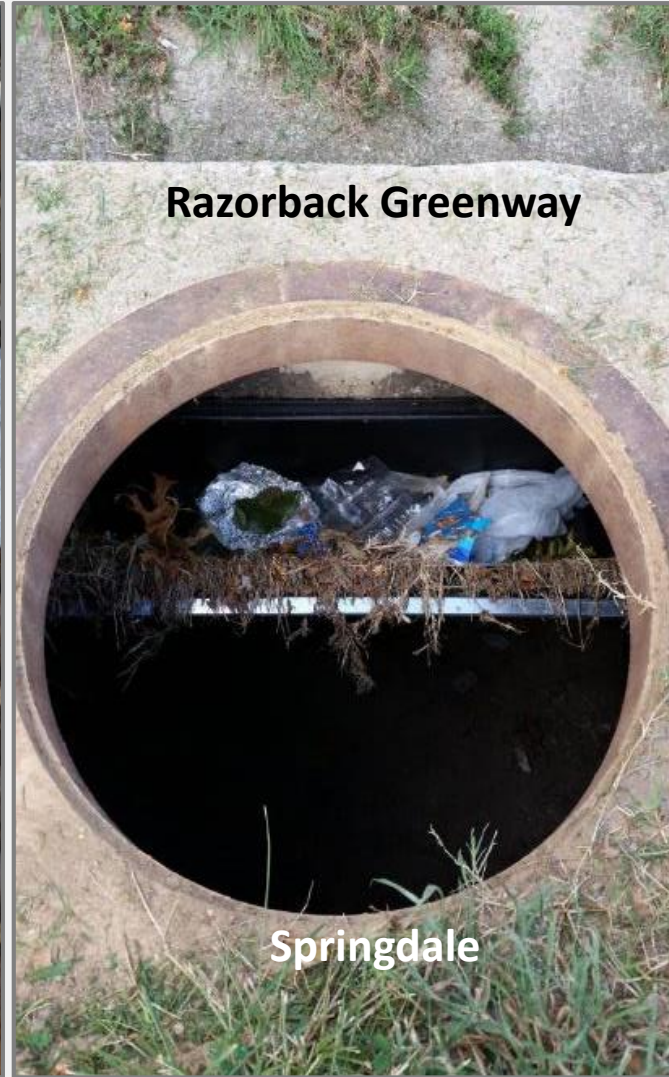
Fayetteville Entertainment District



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 ARTS, EVENTS & LIFE COLUMNS & FEATURES SPORTS

CALENDAR PUBLIC MEETINGS MOVIE LISTINGS WEEKLY DEALS

### Locals install 'Ballot Bins' to limit cigarette butt litter

By Duane Bartholomew November 3, 2016 1 Comment

722 Likes 1 Tweet



One of two 'Ballot Bins' recently installed in the Dickson Street Entertainment District

CleanWaterNWIA @CleanWaterNWIA

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



11:12 AM · 16 Nov 2016

7 Retweets 9 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 of A DIVISION OF AGRICULTURE  
RESEARCH & EXTENSION  
University of Arkansas System

58° 5:35 #NWAnews

### CIGARETTE BALLOT BINS

FAYETTEVILLE

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

KNWA FOX 24 KFTA

UATV HD UNIVERSITY OF ARKANSAS

#PreventLitter Who will win this weekend? LSU Hogs




#PreventLitter What is your March Madness?

Outfield @ NCAA  
Baum Stadium Tournament



#PreventLitter Do you think more Ballot Bins like this will reduce cig butt litter in Fayetteville?

Yes No



University of Arkansas Division of Agriculture - Extension (UAEX)

Page Liked · August 3 ·

Like Comment Share

301 416 Shares 15 Comments

View 9 more comments

Samantha Mezzacapa Tommy Mez Like Reply · August 7 at 10:47pm

Cheyenne Crittenden Meg Dry Like Reply · August 10 at 4:00pm

1 Reply

Ryan Chorice Jeanie Phrommany we could build these things and put them around the shop lol Like Reply · August 10 at 5:06pm

1 Reply

Meg Dry Andrew Cole Henning Like Reply · August 10 at 7:20pm

Benta Hicks Great Idea! Like Reply · August 12 at 9:51am

Katie Folio Sonya Niles Like Reply · August 13 at 5:14pm

Write a comment...

Friend Requests See All

Mary Beth Sanders 15 mutual friends Confirm 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**

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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



CITY OF  
**FAYETTEVILLE**  
ARKANSAS



**(THINK FREE)**  
NWA TOBACCO & DRUG FREE COALITION

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RESEARCH & EXTENSION  
University of Arkansas System

# 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 Alison Ledy

Arkansas's rural forests cover over 19 million acres and contain 11.8 billion trees. As Arkansas's urban areas grow, resulting in forest fragmentation and loss, there is a need to protect forests and, where necessary, replace them. Our canopy cover needs our help, and in return it will help us with home values, water disposal, and cleaner air, just to name a few benefits. The Arkansas Forestry Commission (AFC) has been able to facilitate several projects with grant assistance, which allowed Tree City USA communities to apply for and be awarded with funds to plant trees and improve tree-planting spaces.

In the thriving Tree City USA community of Springdale, AFC was able to provide one such grant for the public works department and the University of Arkansas Cooperative Extension Service (UACES) to create a bioswale project. Bioswales are landscape elements designed to concentrate or remove silt and pollution from surface runoff water. The purpose of a bioswale and infiltration 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, thus becoming more effective over time.

The Springdale plan was to create a demonstration bioswale project to show the benefits of this system. First, the area is identified; stormwater runoff from the recycling drop-off center and the city's Public Works Department yard was washing 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 six to 12 inches above the mulch layer in the basin and then quickly infiltrates the bed. The basin and plants reduce and slow the



Bioswales such as this one in Springdale are very effective at controlling and cleaning stormwater runoff from the many roads and pavements in our urban environment.

stormwater and remove oils and other pollutants coming from nearby roads and pavements. During moderate rainfall events, much of the water infiltrates 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 Jena Spring Creek, a major tributary in the Illinois River Watershed.

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.

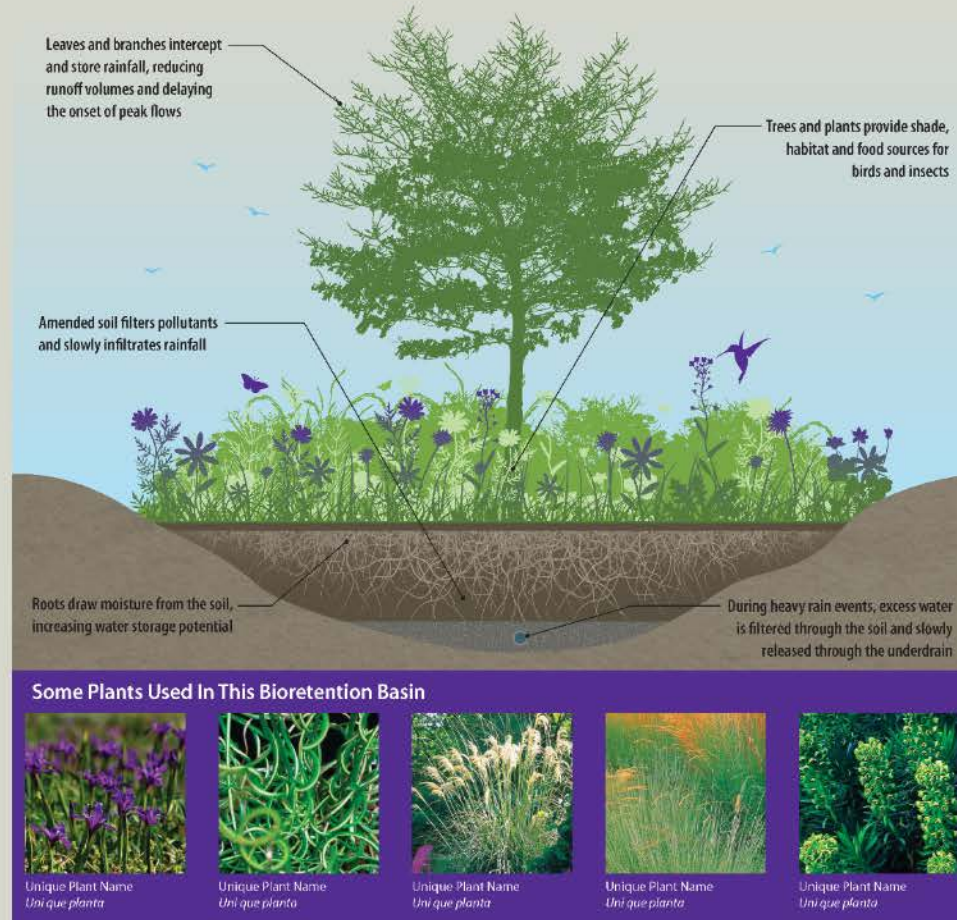
# Manage Runoff with Green Infrastructure

## 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



## 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

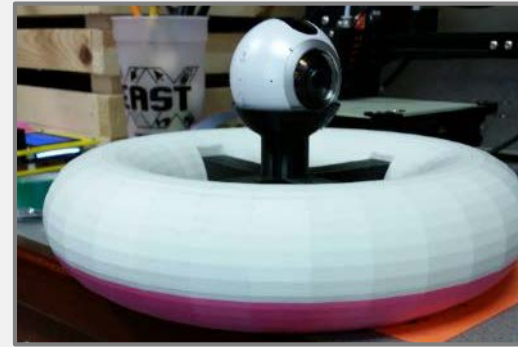
# Upcoming for 2018

- 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



**CITY OF  
FAYETTEVILLE  
ARKANSAS**

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



**SPRINGDALE**  
WE'RE MAKING IT HAPPEN

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

## Vendors

