

Welcome to Beaver Lake

- Offering 633 campsites
- Over 2 million visitors each year
- 487 miles of shoreline
- 420,000 people use Beaver Lake Water
- 539 billion gallons of drinking water comes from Beaver Lake each year.
- 700,000 boaters visit lake per year (USACE-http)



Fig. 1 Beaver Lake, Rogers Arkansas (Photo by Joanna Mentzer)

Stormwater Pollution Prevention Opportunity

At the Prairie Creek Park on Beaver Lake, areas next to a large parking lot (see Fig 1.) were noticed to be very eroded, indicating high volumes of stormwater runoff were exiting the parking lot and flowing into the lake.

Common Contaminants Found in Stormwater Runoff

- **Excess nutrients** such as phosphorous which cause eutrophication (the enrichment of an ecosystem with chemical nutrients.)
- **Sediments** such as dust and soil particles, and eroded asphalt that cloud waterways and disrupt both freshwater and marine ecosystems.
- **Metals** such as lead, copper, aluminum, and zinc, which can become accumulatively toxic in waterways.
- **Chemicals and fuels** that contaminate and reduce productivity of waterways. (Jurries,2009)

Proposed Bioswale Sites & Project Progress



Fig 2. Illustrates the placement of the bioswales that will filter runoff water as it exits the parking lot. (Hodges, 2015)

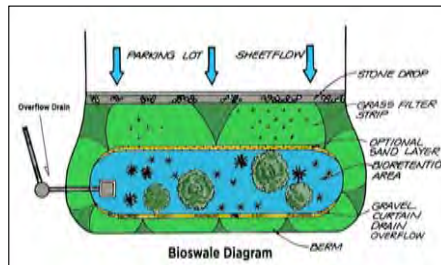


Fig. 3 Typical Bioswale Design (Wahl, 2009)

- Gentle slopes guide water into the bioswale
 - Grass filter strips slow sheet flow water and filter sediments.
 - Native plants and grasses in the bio-retention area reduce nutrient and pollutant concentrations through uptake, as well as aiding in water infiltration.



Fig 4 West bioswale being installed. Photo taken April 8, 2016. (Photo by Joanna Mentzer)

Benefit of Native Plants in Bioswales

Native Plants- Plants that are indigenous to a region in a given geologic time period

Native plants bring many beneficial factors to bioswales such as:

- Not being invasive to the region
- Having greater root depth, which aids in water infiltration
- Provides natural habitat for indigenous species. (Jurries,2003)

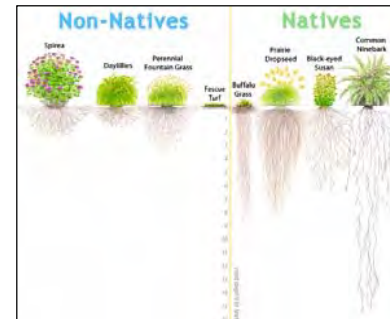


Fig. 5 Native and Non Native Plants Illustration (MARC)

What Will Our Bioswales Do?

- Reduce erosion and flooding dangers.
- Reduce concentrations of chemicals, nutrients, and fuels re-entering waterway
- Reduce polluting sediments from reaching waterways.
- Aid in infiltration of rainwater to recharge local water table.
 - Add aesthetic quality and value to property.
- Aid in plant and animal species diversity, and support ecosystem health by providing habitat and forage for native insect and animal species.
 - Provide runoff treatment of up to ~25,000 gallons/day (Hodges)

Sustainability and Phytoremediation

As a crop scientist with a special interest in sustainable landscaping, I am proud to be associated with projects such as this low impact development bioswale installation. It is a perfect opportunity to use my knowledge of plants as a tool to reduce pollution in my local community.

Installations such as these not only are beautiful to look at, but they will also strengthen plant and animal diversity, and in an economical and passive manner, aid in protecting Beaver Lake's water quality and ecosystem health.

Project Coordination

Having the opportunity to help coordinate this project from it's start has been an exciting learning journey.. I have gained experience in....

- Development of contracts
- Selection of optimal vegetation for bioswale installation.
- Timing deliveries of vegetation orders to ensure plant availability for installation
- Vegetation management before, during, and after installation
- Sourcing and ordering local materials in cooperation with the equipment operator's needs during installation
- Installation and maintenance of on-site erosion controls
- On-site project monitoring for reports to project director.

References

1. US Army Corps of Engineers- <http://www.cwl.usace.army.mil/Missions/Recreation/Lakes/BeaverLake.aspx>
2. Hodges, Kevin PE- SCS Aquaterra,
3. Jurries, D. 2003. Biofilters (bioswales, vegetated buffers, & constructed wetlands) for stormwater discharge pollution removal. www.deq.state.or.us/wq/stormwater/docs/nwr/biofilters.pdf