



**Federal Section 319
Nonpoint Source Grant**
2002-0265



Ann Arbor
District Library

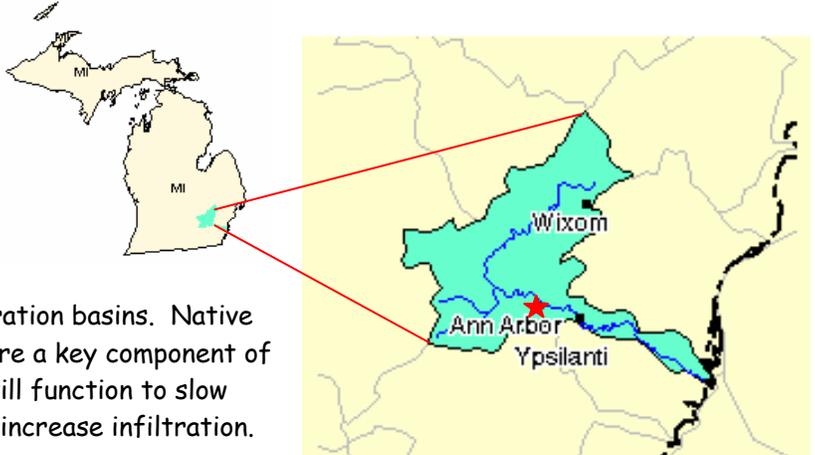
Ann Arbor District Library
Telephone: (734) 327-4263
Fax: (734) 327-8309
Email: parkerj@aadl.org
Contact: Josie Parker, Director

Malletts Creek Branch, Ann Arbor District Library

August 8, 2003 - November 30 2005

Project Description: Malletts Creek Branch of the Ann Arbor District Library was designed to treat storm water from a 2.66-acre, urban site that contains a portion of Malletts Creek, a tributary to the Huron River. The project responds to concerns addressed in the Malletts Creek Restoration Plan, an addendum to the DEQ-approved Watershed Plan for the Huron River in the Ann Arbor-Ypsilanti Metropolitan Area.

This project aims to reduce contaminant and phosphorus loading through implementation of an innovative, natural-systems approach to storm water management. This approach increases the site's potential for infiltration and pollutant removal by means of a vegetated green roof, overland flow, vegetated bioswales (bioretention), and detention/infiltration basins. Native plants, which require no phosphorous inputs, are a key component of the storm water management system. They will function to slow water flow, reduce erosion, absorb water and increase infiltration.



Traditional storm water management systems rely heavily on expensive underground pipe systems which do little to clean, slow or allow water to infiltrate into the soil. In contrast, this management plan is a cost-effective means of handling storm water on-site through a natural systems approach, which takes advantage of the ability of native plant material and soil to clean, slow, and store water. Money was spent above ground on soil

amendment and plant material to create a green infrastructure (instead of on underground pipe systems), which impacts the quantity and quality of water that leaves the site to enter Malletts Creek. This natural-systems approach to storm water management enhances the quality of local habitat and begins to create a green network through the surrounding urban infrastructure through the use of native forbs, grasses, and shrubs.



Grant Amount: \$236,000

Match Funds: \$144,750

Total Amount: \$380,750

Best Management Practices:

- Vegetated Green Roof
- Bioswales (Bioretention)
- Overland Flow (through vegetated swales)
- Native Vegetation
- Detention/Infiltration Basins
- Non-Phosphorous Fertilizer

Average Load Reductions:

The table at right summarizes the results of the sampling conducted to determine the average reduction in pollution concentration and load of the storm water after it passed through the bioswales. Results of chloride, phosphorus and TSS were inconclusive.

Parameter	Average Reduction in Concentration (%)	Average Reduction in Load (%)
Copper	23	41
Lead	21	47
Zinc	53	66
Oil and Grease	> 36	> 49
TDS	-17	17

It is reasonable to believe that due to the influent location, the average performance of the bioswales on-site may have been higher than reported in this study. The pollutant reduction from the site as a whole is likely much higher when considering the additional impact of the detention/infiltration basin and the vegetated green roof.



Pre-Construction Constraints and Opportunities:

Instead of choosing to develop in more natural lands that would contribute to sprawl, the library sited their Malletts Creek Branch as an infill development on a degraded lot within existing urban infrastructure. Despite the urban surroundings, the project uses native plantings throughout the site in a manner that is visually integrated with its context. This project is a demonstration of how to use an innovative, natural systems approach to storm water management in an urban setting.

Note the urban context of the site in the aerial photo and its relation to Malletts Creek Drain, which daylights just south of the site. Below is an image showing the pre-construction site, which exhibits heavy clay soils and low-quality vegetation.



Malletts Creek Branch Post-Construction BMP Implementation

Vegetated Green Roof:

The best management practices on this site treat the storm water by separating the 'clean' water that runs off the roof from the 'dirty' water that runs off the parking lot.

The water that falls on the roof first comes in contact with the vegetation and the soil of the green roof, any water that is not absorbed in the soil and plant material runs off via rain chains and is directed through vegetated swales and over the longest path possible, until it reaches the detention basin.



Bioswales:

The water that falls on the parking lot is first directed through stone-lined curb cuts, where the majority of the sediment drops out. The water then flows through the vegetated bioswales where it is cooled, cleaned, slowed and infiltrated. Any water that can not be handled by the bioswales is directed overland or through an underground perforated pipe into the detention basin, where it meets any overflow from the roof and is further treated and allowed to infiltrate or be absorbed by the native vegetation.

The image below shows how patrons are directed to walk through and experience the storm water management system via bridges that span the bioswales.



Partners Involved:

Many people and organizations have contributed to the successful implementation of storm water best management practices at the Malletts Creek Branch of the Ann Arbor District Library.

- Ann Arbor District Library
- InSite Design Studio, Inc.
- Luckenbach Ziegelman Architects, PLLC.
- Tetra Tech, Inc.