RETROFITTING DETENTION BASINS IN CHERRY HILL, NJ

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Abstract

Stormwater detention basins are primarily designed for flood control but can be "retrofitted" by increasing native vegetation, altering flow through structures and minimizing mowing to provide increased infiltration and increased wildlife habitat. Rutgers Cooperative Extension Agents are working with the Camden Soil Conservation District and Cherry Hill, NJ, municipal officials to retrofit existing basins. This can provide a larger benefit to the surrounding ecosystem by providing the time and place for stormwater to infiltrate at the site rather than runoff directly to the stream, as well as incorporating native vegetation for pocket suburban habitats. Retrofitting, or "naturalizing" the basin can also provide valuable environmental education opportunities.

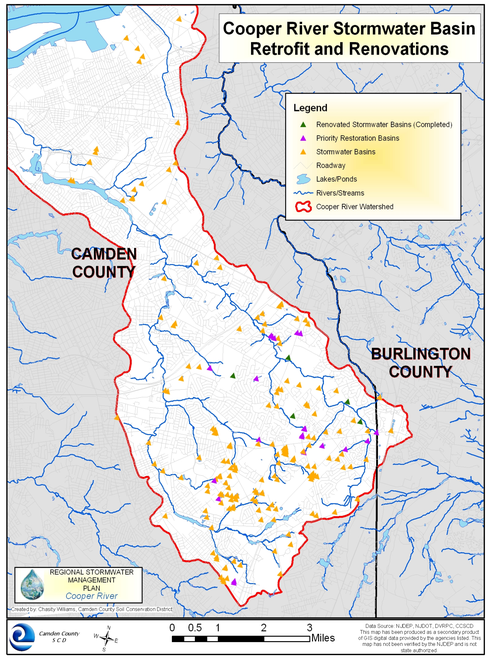
Current Project

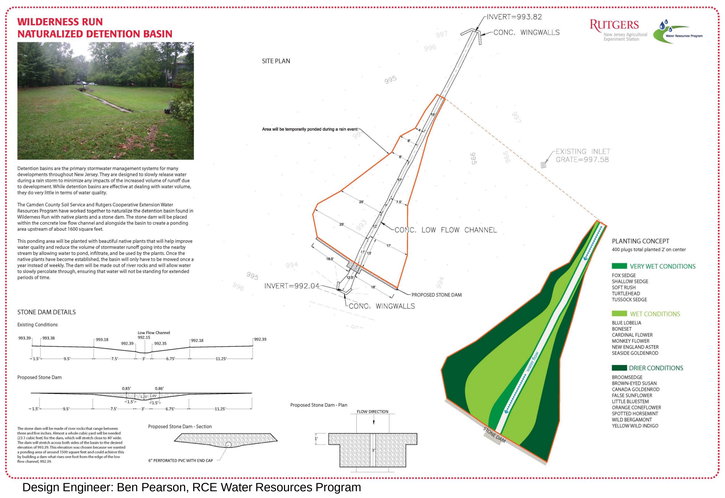
In this project we retrofitted several existing detention basins in Cherry Hill, NJ. These retrofits should provide improved water quality treatment, reducing sediment and nutrient loadings to the stream, increase infiltration (Guo, 2009) and be cost effective. Basin retrofits are also designed to provide detention of stormwater over a greater surface area allowing for infiltration and pollutant removal of the smaller, more frequent storm events (less than 1.25 inches), and reducing or delaying the peak discharge to the receiving waterbody.

The identification of a good basin to retrofit would include finding one that has: short turf-type vegetation from regular mowing; a low flow concrete channel; a discharge orifice greater than 3 inches; and is not used for other purposes when dry. It is also important to consider the depth to groundwater so that the potential infiltration is maximized.

One of the main goals with retrofitting a basin is to increase the surface area that stormwater covers, thereby increasing the volume of stormwater that can be filtered through the vegetation and infiltrated into the soil. This typically involves modifying the low flow channel by either: 1) removing the concrete low flow channel and replacing it with vegetation or stone; 2) placing a structure across the channel to deflect the stormwater out into the basin, modifying the outlet structure (Emerson, et. al., 2005).

Working with officials in Cherry Hill, NJ, five basins were chosen as sites for "naturalization". These sites include basins that are owned by the county or town, and whose retrofitting had broad support of the local residents. After initial installation of the flow distribution gabions, volunteer efforts aided in planting of the native vegetation while Rutgers Extension Agents and Camden County Soil District personnel provided guidance and support.





Design Engineer: Ben Pearson, RCE Water Resources Program

Maintenance

Instead of weekly or bi-weekly mowing, retrofitted basins need only be mowed once a year, preferably in late fall after the first frost. By not mowing during the growing season, the mature vegetation can improve wildlife habitat and provide ecological benefit. If possible, mowing when the ground is frozen will prevent or greatly reduce compaction and rutting in the basin bottom.

Vegetation

Native grass, herbaceous vegetation, or a wild flower mix should be planted in the basin bottom. This can be done by either: removing the sod layer and replanting with seed; by "drilling" seed through the existing grass; or by planting plugs of new herbaceous plants into the existing bottom. If shrubs are to be used, they should be clumped in "islands" and not spread out through the basin. This will help keep the shrubs from being mowed down during the annual maintenance.

Results

The desired result of a successful detention basin retrofit is to provide runoff from the smaller storms with the time and space (storage) to infiltrate to groundwater, while providing the necessary flood protection at all times. Beautiful native vegetation can become a site of environmental education while providing the local community with increased ecosystem diversity.

An additional benefit of the basin retrofits is the potential maintenance cost savings due to reduced mowing schedules and reduced consumption of resources for mowing (Blaine & Smith, 2006). Since retrofitting five basins, the Director of Public Works for the Township of Cherry Hill, NJ, estimates saving up to $20,000 annually in maintenance costs. This provides a window into the potential benefit that changing the manicuring methods of stormwater management that have become entrenched in towns across the country could have on our future.

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