



RAIN GARDENS REDUCE RUNOFF

by Gweneth Newman

Reprinted from the January-February 2003 edition of *Westchester Environment*

When it rains, we witness water flowing from our roofs, onto lawns, down streets and into storm drains. What we don't see are the incredible amounts of pollution this rainwater picks up along the way - things like motor oil, brake fluid, pesticides, fertilizers and animal waste. Because most properties aren't designed to absorb and utilize stormwater, all these pollutants sit around collecting and, when it rains, wash into the drains, into our streams, and in the case of my backyard, into the Boston Charles River.

When the EPA and MIT sponsored a national contest looking for fresh ideas that - costing less than \$10,000 to implement - would stop the free flow of bacteria and pollutants into the river, my classmate Katherine Alberg Anderson and I took the opportunity to share some of our ideas about how to retain this resource on site, beginning in the front yard of a typical Cambridge residence.

Our project focused on several objectives. We viewed the house as representing its own miniature watershed. We wanted to provide a prototypical design whose wide palette of stormwater treatment options could allow homeowners to select some - or all - of the recommendations. It was important to us that construction of the project was both doable and durable. Homeowners could build it themselves and feel comfortable having their families use it, let the kids run around and have the impact on the landscaping be minimal. Our intent was to incorporate both functional and aesthetic design in order to bring stormwater out of the drain and visualize the benefits of retaining it on site.

The final product of our design harvested stormwater from the roof and ground surface and converted it into uses that were visual, ephemeral and sustaining in a multitude of ways. Rainwater gardens were placed along all four sides of the house, collecting water generated by downspouts and surface runoff. Water routed to these landscaped depressions would be naturally filtered by plants and soils, removing excess nutrients and pollutants. Rock filters and dry streambeds were included to assist in guiding and filtering water into these gardens, as well as to stimulate visual interest of water tumbling and moving.

A rain barrel was included in the design to collect runoff generated by the roof. Attached to an existing gutter with minimal modification, the water collected in rain barrels can be saved as a reserve with which to irrigate the landscape. To quantify: for a roof roughly 625 square feet in area, a storm generating a quarter inch of rainfall would produce 98 gallons of water.

Porous pavers were suggested as an alternative to the typical asphalt driveway. These pavers are unique in that they consist of strong structural materials regularly interspersed with voids that are filled with sandy loam or grassed turf, allowing for rainwater retention and infiltration.

It was important to us that the design reinforced our notion of getting water out of the gutters and really celebrate the qualities of its sound, fluidity and significant visual attributes. The result of these efforts took form in what we call the rain-chain pergola walk. A decorative alternative to downspouts, rain chains originated in Japan, where they have been around for hundreds of years to provide a beautiful and functional watercourse for rain.

Too often we are ready to shuttle away what storms bring us, viewing water as a problem rather than as an opportunity. Rather than installing expensive pump-powered fountains and water features into our properties, why not capitalize on what we get naturally? We need to increase people's awareness of what an important resource rainwater is by interventions at the local scale, beginning in our own front yards. And while the impact of one house improving the condition of regional streams and rivers might seem hard to fathom, just imagine what one entire block or one neighborhood might be able to achieve. It all adds up. And all it takes to start are ourselves and some creative ideas for a gutter.

Gweneth Newman and Katherine Alberg-Anderson are studying Landscape Architecture at Harvard's Graduate School of Design. Together they won the EPA/MIT first prize for utilizing rainwater.

