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Bioretention Islands

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What is a bioretention island:

Bioretention islands are landscaping features adapted to treat stormwater runoff. They are most frequently located within parking lot islands but can also be incorporated into cul-de-sacs and small pocket gardens in residential land uses. Instead of raised planters, bioretention islands are depressions that collect and filter the first ½ inch of rainfall off paved surfaces. Bioretention islands are designed so that surface **runoff** is directed into the vegetated islands. The vegetation absorbs stormwater and filters pollutants from the runoff. Often, the filtered runoff is collected in a perforated pipe under the island and returned to the storm sewer system. In larger storm events, runoff is diverted past the island to a storm drain.

Bioretention islands are typically used for stormwater management in small drainage areas, such as a small parking lot, or an individual residential property. However, they are quite versatile in that they can be employed in almost any soil condition. Even existing parking lot landscape islands can be retrofitted to incorporate bioretention.

To enhance pollutant removal, the bioretention island should be sized to be between 5% and 10% of the **impervious** area draining to it. The underlying planting bed should be designed as a sand/soil mix with a mulch layer above the soil. The surface of a bioretention area is usually planned so that it ponds a small depth of water (6-9 inches) above the filter bed. And some bioretention islands also are designed to help spread flows evenly and settle out large particles.

Why consider bioretention islands:

Bioretention islands remove a wide variety of pollutants, including suspended solids and nutrients. They can be employed to improve water quality in areas that often generate a variety of pollutants (parking lots, roadways). Most municipalities already require landscaping islands in land development proposals, so some very simple plan modifications could go a long way towards addressing existing stormwater management requirements and increasing water quality at the same time.

Limitations:

There are very few limitations to bioretention island applications besides their requirement to treat small drainage areas.

Benefits:

By now, most of us realize that traditional storm water management systems empty runoff into local streams without any treatment. The main benefit of bioretention islands is their pollutant removal capability. Bioretention islands are easy to fit into a project in urban areas where land availability for traditional facilities is scarce.



**Cost:**

Bioretention beds incorporated into parking lot landscape islands should not significantly exceed the costs of normal island construction and landscaping.

Maintenance:

Monthly inspections are recommended until the plants are established. Afterwards, seasonal landscaping maintenance is required for bioretention islands, similar to those required for all planting beds (remulching, treating diseased shrubs and trees, watering, removing litter and debris). Bioretention islands should be designed so that they are easily accessible for maintenance.

Materials:

Plant selection is critical to the function and appearance of the bioretention islands.

Native vegetation should be incorporated as much as possible. Ideal plants include those that can tolerate both wet and dry conditions and tolerate pollutants associated with stormwater runoff.

Suggested Plants:

Trees: red maple (*Acer rubrum*), river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), black alder (*Alnus glutinosa*), black gum (*Nyssa sylvatica*), swamp white oak (*Quercus bicolor*) and willow oak (*Quercus phellos*)

Shrubs:

winterberry (*Ilex verticillata*), arrowwood (*Viburnum dentatum*), red chokeberry (*aronia arbutifolia*), redosier dogwood (*Cornus sericea*), silky dogwood (*Cornus amomun*), and buttonbush (*Cephalanthus occidentalis*)

Herbaceous plants:

broomsedge (*Andropogon virginicus*), common three square (*Scirpus pungens*) switchgrass (*Panicum virgatum*), blue flag (*Iris versicolor*), sweet flag (*Acorus calamus*) New York ironweed (*Veronia noveboracensis*) and soft rust (*Juncus effusus*)

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