

Planning *by* Design

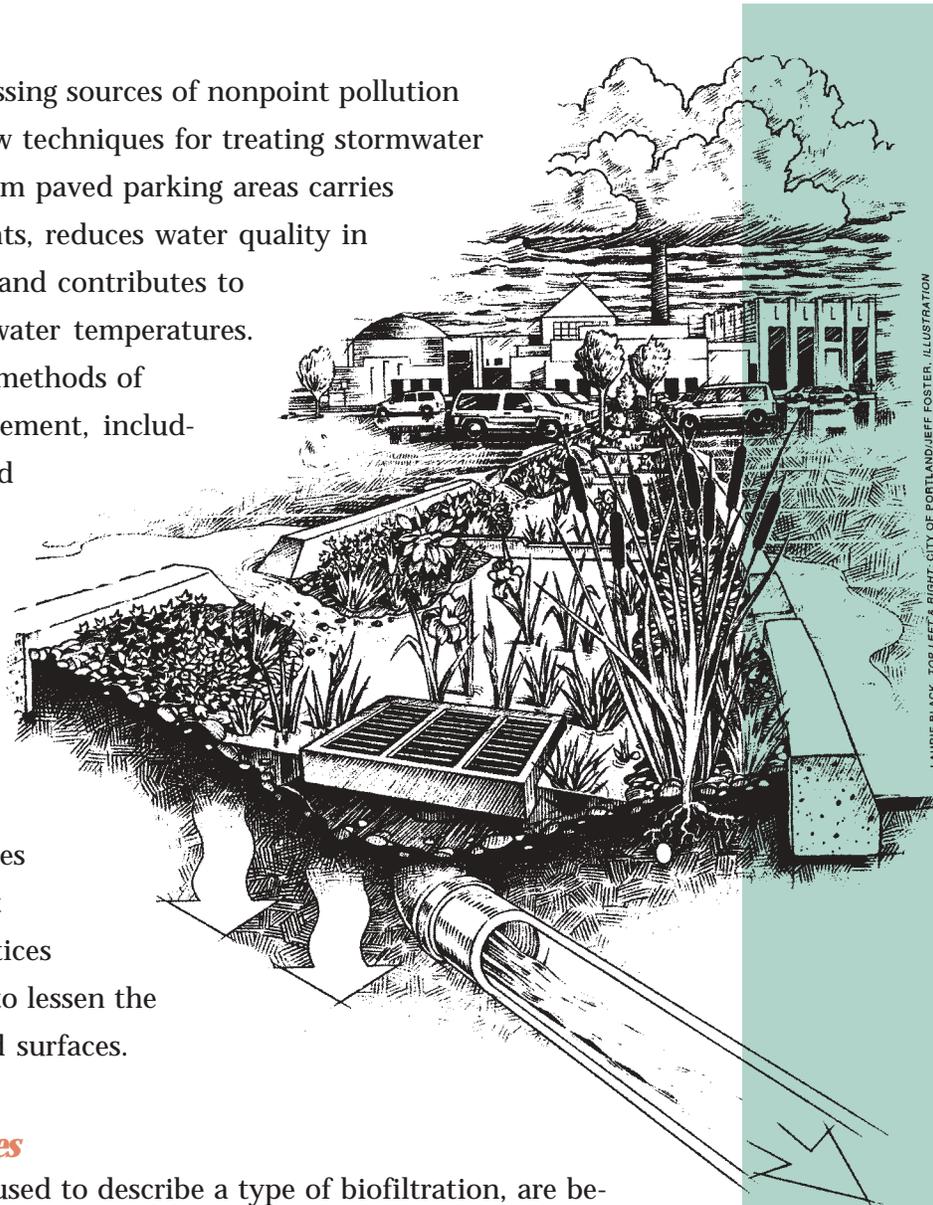
Enhancing Stormwater Management

Bioswales

Concern for addressing sources of nonpoint pollution has focused on new techniques for treating stormwater runoff. Runoff from paved parking areas carries numerous pollutants, reduces water quality in receiving streams, and contributes to increased stream water temperatures. The conventional methods of stormwater management, including conveyance and limited detention, do not address the impacts from parking lot paving. Biofiltration and bioretention techniques are types of stormwater best management practices (BMP) that work to lessen the impact from paved surfaces.

Design Features

Bioswales, a term used to describe a type of biofiltration, are becoming recognized as preferred treatment for parking lot runoff. Instead of raised planters and curbed planting islands, bioswales are linear depressions that collect and filter the first ½ inch of rainfall off paved surfaces. The runoff drains through curb cuts or wheel stops into planted areas. It is filtered and absorbed by vegetation that is tolerant of wet conditions. The runoff from heavier



LAURIE BLACK, TOP LEFT & RIGHT; CITY OF PORTLAND/JEFF FOSTER, ILLUSTRATION

rains is conveyed to overflow drains that lead to detention areas elsewhere on the site. Plantings in biofiltration/bioretention areas must consist of plant species tolerant of wet soils and periodic inundation. Plant species with salt tolerance are desirable in areas where deicing salts are used. Shade trees can be planted to cool the parking lot, shrubs can be planted for screening, and herbaceous plants can be used as ground cover for controlling soil erosion and treating stormwater runoff.

Recommended Plantings

It is strongly recommended that native plant species be used in bioswales since drainage areas eventually lead to natural areas where exotic species are not desirable. Suitable canopy tree species for wet soil conditions include 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*).

Native shrub species adaptable for periodic flooding conditions include winterberry, (*Ilex verticillata*), arrowwood, (*Viburnum dentatum*), red chokeberry, (*Aronia arbutifolia*), redosier dogwood, (*Cornus sericea*), silky dogwood, (*Cornus amomun*), and buttonbush, (*Cephalanthus occidentalis*). Herbaceous plants for these stormwater drainage areas include a wide array of wetland species.

Common herbaceous plant species include broomsedge, (*Andropogon virginicus*), common three square, (*Scirpus pungens*), switchgrass, (*Panicum virgatum*), blue flag, (*Iris versicolor*), sweet flag, (*Acorus calamus*), New York ironweed, (*Vernonia noveboracensis*), and soft rust, (*Juncus effusus*).



Additional information on stormwater management is available from MCPC.

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