

Urban landscapes generate runoff with almost every rainfall event. Installation of best management practices (BMPs) helps restore hydrological functionality, or the ability of urban landscapes to better infiltrate rainfall. BMPs capture and infiltrate stormwater and reduce a property's contribution to water quality degradation, flashy stream flows and flooding. Information on the most common urban BMPs follows.

Technical and financial assistance is being provided by the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation (IDALS-DSC) to help implement urban conservation across Iowa and expand efforts to protect soil and water resources. Another priority for urban conservationists is providing information and educational assistance to a multitude of audiences.

Technical Assistance

Urban Conservationists are strategically stationed in soil and water conservation district (SWCD) offices throughout the state and the Urban Conservation Program Coordinator, is headquartered in the DSC central office in Des Moines. Link to Iowa's Stormwater Management Manual for design specifications at <http://www.intrans.iastate.edu/pubs/stormwater/index.cfm> .

Financial Assistance

A number of funding sources authorize expenditures for urban BMPs. These include, but are not limited to:

- Watershed Protection Fund (WSPF)
- REAP Water Protection Fund (WPF)
- Watershed Improvement Review Board (WIRB) – see the WIRB website <http://www.iowaagriculture.gov/IWIRB.asp>
- State Revolving Fund (SRF) Stormwater Management Low-Interest Loan Program

Additional information and resources are available at the IDALS-DSC website:

<http://www.iowaagriculture.gov/FieldServices/urbanConservation.asp>

See the Iowa Stormwater Management Manual for information on all approved Best Management Practices (BMPs). <http://www.intrans.iastate.edu/pubs/stormwater/index.cfm> . Some of the BMPs are highlighted below.



Bioretention Cells: Bioretention involves the capture and infiltration of stormwater runoff from impervious urban surfaces to treat pollutant loads. Bioretention also reduces the volume of hot, dirty runoff that reaches receiving waters via storm sewers. Bio-cells are depressions that are sized and located to capture and temporarily pond runoff. Below ground, an engineered subgrade goes down 42" to 48". The subgrade has a perforated drain pipe in a rock bed, covered by a sandy loam soil mixture. Typically ponding depth will range from 6" to 9" and should drain down in 12 to 24 hours.

Bio-cells are planted to appear garden like, and use of native plant species is encouraged. Bio-cells typically are used in settings with large impervious surfaces (i.e. parking lots) where extensive land grading (disturbance) has occurred. For more information, see Appendix 7 of the Rain Garden Manual. <http://www.iowaagriculture.gov/press/pdfs/RainGardenManual.pdf>



Bioswales: Bioswales are vegetated drainage ways that convey runoff. Typically, the subgrade of a bioswale is engineered to ensure infiltration of runoff from small rains. When big rains occur, the bioswale will infiltrate the dirty first flush of runoff and then convey excess runoff to receiving waters. Maintaining and enhancing natural drainage ways can save money by eliminating the need to install storm sewers.



Native Landscaping: One of the easiest ways to enhance the landscape's ability to manage water more sustainably is to strategically install landscaping that features native plants of the tallgrass prairie region. Native plants have deep root systems that will help build soil quality which increases infiltration and reduces runoff. Native plants are tolerant of weather extremes and don't need fertilizers or pesticides. Native plants also create habitat for birds, wildlife, butterflies and other species. After establishment, native landscaping is cheaper to maintain.



Permeable Pavement: Transportation surfaces (roads, parking lots, driveways) account for over 60% of impervious urban surfaces. Permeable pavement allows rainfall to infiltrate down rather than running off into storm sewers. Rainfall moves into a rock chamber below the pavement. A bio-film develops on the aggregate of the rock chamber where microbes live. The microbes capture pollutants such as hydrocarbons and break them down. Water in the pore space between the aggregate either percolates out and down through surrounding soils or moves to a perforated drain pipe installed in the rock chamber. Water is slowly

released to become ground flow or enter surface waters after it has been cleaned and cooled by moving through the pavement and underground rock chamber.



Rain Gardens: Rain gardens perform bioretention services but do not have an engineered subgrade. Rain gardens rely on healthy soils with good infiltration and percolation rates to manage ponded runoff water. A thorough soils investigation is needed to ensure a proposed rain garden site has soils with adequate percolation rates. Rain gardens are typically used in residential settings to manage runoff from smaller impervious surface surfaces like roofs. In some residential development, soils are altered and compacted and require an engineered subgrade to ensure drain down time of 12 to

24 hours. [For more information, see the Rain Garden Manual.](http://www.iowaagriculture.gov/press/pdfs/RainGardenManual.pdf)

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Soil Quality Restoration: Healthy soils can infiltrate and store large quantities of rainfall. A typical prairie soil should have had the pore space to store about 2.5" to 3" of rain in the top foot of soil, and probably twice that much in the first 4 feet of the soil profile. If soils have been altered and compacted by grading or construction activities, they lose their ability to infiltrate and store water. Poor soil quality means lawns will generate runoff after only a small amount of rain. Restoring soil quality involves increasing organic matter in the soil and

increasing pore space. Deep tillage and compost applications will help restore soil quality after new construction. Aeration and compost applications will increase water holding capacity on existing lawns with poor soil quality. [For more information, see the Soil Quality Brochure.](#)

<http://www.iowaagriculture.gov/FieldServices/pdf/SoilQualityBrochure.pdf>

St. Charles, Truro, Bevington, Patterson and Winterset are designated priority watersheds, therefore landowners which live in those towns may be eligible for cost share. Visit your local NRCS office located at 815 E. Hwy 92 Winterset IA 50273 or call 515-462-2961.