

Native Plant Restoration

By Jon Dittmar

Designing or adapting military base infrastructure for environmental sustainability enhances readiness while reducing maintenance and extending the useful life of grounds and facilities. Using native plants in landscaping can result in more sustainable solutions for managing stormwater, controlling erosion and maintaining waterway navigability, while reducing construction and ongoing operating costs.

Engineers with responsibility for overseeing development affecting navigable waterways in a regulatory or project management role also will find that the advantages of using native plantings are a key contributor to long-term project success.

Utilizing Native Plants

Using native plants in landscaping is an often overlooked aspect of creating an environmentally sustainable building project. Uniquely adapted to the local ecosystem, native species require fewer resources to maintain because most native planting areas do not require trimming or pruning and only require limited mowing. Once established, they often use less chemical herbicides and pesticides. Their deeper root systems promote better erosion control and improved water infiltration into the soil. Most native species have enhanced drought tolerance, are harder than their cultivated cousins and provide increased wildlife habitat.

Contrast this with what non-native plants and turf grass need to thrive: frequent watering, chemical fertilizer, pesticides, mowing and proper drainage. Some non-native plant species also are invasive, spreading beyond the original

planting area and out-competing native communities. A design using native plants exclusively addresses these issues while positively impacting project sustainability.

Managing Stormwater Effectively

The need for stormwater management further illustrates where native plantings are particularly effective. Land forms its own stormwater management channels naturally in response to the terrain and vegetation. As more hardscape structures are built on formerly undeveloped land, there is less land surface area available to absorb stormwater.

On developed land, stormwater has to be directed to proper locations to be absorbed. Otherwise, erosion, infiltration, flooding, or other problems occurring around structures can ultimately undermine them. Stormwater runoff also can create other environmental problems by contaminating nearby streams and other surface water bodies.

Well-designed native plant buffers, swales, rain gardens and retention areas absorb, direct and hold stormwater until the high water event is over and the stormwater can be absorbed into the ground. Native plants are ideal for delivering this functionality in these areas for a long time due to their deeper root systems and low maintenance requirements. Common contaminants also are absorbed by native plants, protecting surrounding surface and groundwater sources.

A good, practical example of how using native plants works in managing stormwater runoff is The Greater

“Native plants as a key design element help ensure the twin sustainability goals of lower impact and less maintenance are realized beyond the initial establishment and monitoring periods.”



This restored wetland prairie and detention pond is part of a sophisticated and highly sustainable system for stormwater management at the 250-acre GCAA facility in Matteson, Ill. Native wetland vegetation areas slow runoff and capture contaminants.

Chicago Auto Auction (GCAA) facility in Matteson, Ill. The U.S. Army Corps of Engineers (USACE), which has permitting jurisdiction over development affecting navigable waterways in the U.S., provided regulatory oversight for this project. Comprising more than 250 acres, this complex requires a large amount of open space in order to manage its stormwater flows.

The stormwater management design for GCAA includes more than 2,500-linear-ft of bio-engineered filtration swales planted with native wet prairie and emergent vegetation. Hard-armor grade controls are incorporated into the swales along with graded micro pools that slow runoff and improve uptake of contaminants by the native vegetation. Via the swales, stormwater is directed through a 20-acre open water lake surrounded by emergent wetlands and native prairie. The lake overflows into a wet prairie surrounded by an additional prairie buffer.

As a result of this development, the constructed wetlands enable this facility to function hydrologically much like the land did in a pre-development state despite the large amount of impermeable surface area on the site. Contaminants from stormwater runoff are filtered out by the native wetland plants as the water is absorbed into the ground. This avoids creating another environmental problem.

Restoring and Maintaining Waterway Navigability

Regulatory oversight is not the only role USACE plays in waterway-related development. USACE also takes an active management role in innovative projects that restore ecological balance and improve sustainability, while reducing development and future maintenance costs.

Butler Lake in Libertyville, Ill., and Wolf Lake in Hammond, Ind., are good examples of the benefits of using native plants to help reduce waterway erosion and maintain navigability. USACE worked with local municipalities to find solutions to problems with silt deposits damaging the aquaculture and reducing navigability in both lakes.

Butler Lake, Ill.

The river emptying into Butler Lake, combined with shoreline erosion, was filling in the lake at an excessive rate. As a result, most fish in the lake died whenever the lake froze. More frequent dredging was the conventional solution to restoring and maintaining navigability, but offsite disposal proved to be very costly because it would have to be hauled by trucks a significant distance to a suitable location.

A more innovative approach involved creating a barrier island made of dredged material and locating it near the river inlet. Native plantings keep the barrier island in place and functioning. Dredging operations are less frequent as a result, and the need to dispose of dredged materials offsite was eliminated. In this case, ecological sustainability was improved while project and ongoing maintenance costs were reduced. Once again Butler Lake supports a fish population.

Wolf Lake, Ind.

Silt buildup was creating similar problems at Wolf Lake, but it was not being transported from upstream sources by a river. A manmade lake on the Illinois-Indiana border, Wolf Lake is bisected by the Indiana Toll Road. Shoreline erosion was causing silt to fill in the lake. Although dredging was called for, the cost of offsite silt removal was judged to be excessive.

Once again, creating islands made

from dredged material along with shoreline erosion control proved to be a more innovative solution. The islands reduced the wave action against the shoreline that contributed to erosion. Native plants on the islands and surrounding shores of Wolf Lake hold the soil in place and slow the movement of stormwater runoff.

By returning much of the shore surrounding the lake to a more natural wetland state, the effects of stormwater runoff into the lake were greatly reduced and another major contributor to shoreline erosion and silt buildup has been brought under control.

Originally a wetlands area before settlement, Wolf Lake has been returned to a more pre-settlement state while preserving navigability. It also is a favorite site for fishing and windsurfing.

Achieving Sustainability Goals

Achieving environmental sustainability in landscape design is not as elusive or costly a goal as it first sounds. The search for improved sustainability often leads to innovative solutions that prove less costly both initially and over time. Native plants as a key design element help ensure the twin sustainability goals of lower impact and less maintenance are realized beyond the initial establishment and monitoring periods. ■

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As Butler Lake in Libertyville, Ill., demonstrates, establishing native vegetation along shorelines reduces erosion and prevents silt deposits from filling in otherwise navigable waterways.