Engineering With Nature Project Fact Sheet

Title

A Design Manual for Engineering with Nature Using Native Plant Communities

Background

Native plants are critical resources for wildlife habitat, erosion control, sediment filtration and water quality issues, and are the basic component of ecosystem restoration. Plants are often “keystone” species that hold together entire ecosystems and important for many ecological processes to occur. Plant communities in the built environment can provide structure, function and natural processes to create a sustainable landscape. The National Vegetation Classification System and Nature Serve database (2013) has defined more than 800 plant communities in the United States and Canada, many of which occur on Corps lands. Choosing a plant palette from a natural plant community that is either present or appropriate for the site, as determined by a site analysis of conditions, will provide ecological benefits and be adaptable to fluctuating conditions. Incorporating plant communities into designed landscape elements will enhance the visual aesthetics and add multiple ecological functions.

Corps lands offer diverse plant communities providing a palette of native plants for designed elements in the landscape

Objectives

The design manual will describe how to utilize plant communities within the built environment and to create sustainable landscapes. This design manual is important because it promotes our native plant communities, which in turn supports native fauna. Many plant communities exist on Corps lands and will provide stability in designed landscape elements that are part of the Corps facilities and landscapes nationwide.

Approach

The approach is a shift in emphasis, away from a fixed design held at a static moment, to a dynamic changing design allowing for plant communities to grow and mature over time. Plant communities not only survive, but are adaptable to changing environmental conditions. Native plant communities have natural resiliency built into them by genetic and species biodiversity. The design manual will review, identify and document the use of native plant communities to provide engineered landscape architectural design elements and sustainable landscape solutions. The manual will summarize principles, appropriate guidance for managing plant resources, identify existing databases and sources for native plants, and provide designs for various landscape elements using plant communities. Chosen design elements will be exemplified by case studies and designs that relate biological, ecological and engineering attributes together. Design elements include: climate control plantings and windbreaks to conserve energy, live fencing for security and creating privacy, slope stabilization, vegetated swales and retention ponds to check erosion, and rain gardens for water conservation. A literature reference section will also be included to provide more information.

Outcomes

Products include: a brochure, the Design Manual, and a peer-reviewed article to be presented at a professional conference (FY2014). Incorporating native plant communities by Corps designers and project planners in their plans, designs, and specifications; and by Corps resource managers and maintenance personnel, to provide self sustaining features in the landscape that would require less maintenance after project implementation, would offer cost savings with greater ecological benefits to the environment. Many native plant communities are present on Corps lands, however are often overlooked and undervalued. This approach will help transform the way in which native plant communities are thought about and valued by the Corps.

Point of Contact: Dr. Pamela Bailey
Pamela.Bailey@usace.army.mil; 601-634-2380