

## **FAIRFAX COUNTY NATURAL LANDSCAPING MANUAL**

### **Introduction**

To further the goals of its environmental agenda, it is the policy of Fairfax County to apply natural landscaping concepts and techniques in the landscape design, implementation, and maintenance of County-owned properties and facilities.

Natural landscaping practices and materials can be used to protect and enhance existing natural resources, including soil and water; mitigate climate change, improve and preserve air quality; and contribute to resource conservation.

Natural landscaping is guided by locally native plant species and communities, and incorporates natural features such as topography and water into designed landscapes that attempt to emulate plant arrangements and relationships found in nature. In the construction of new facilities, the site is analyzed and existing natural assets (such as desirable vegetation, soil, and water and land features) are identified, incorporated into the design, and protected and preserved through the construction phase of the project. Landscape renovations or retrofits on previously disturbed sites take advantage of the opportunity to improve soil quality, incorporating appropriate amendments and improving aeration and infiltration. An important natural landscaping concept is improving the soil's ability to absorb and store water, minimizing runoff and the need for supplemental irrigation during periods of drought. This enhancement is achieved, in large part, by reducing the use of turfgrass in favor of mulch and groundcovers; and in some cases, allowing leaves and woody debris to accumulate and decay in place. From an aesthetic perspective, this may require an adjustment for some people. Careful planning and proper management can produce a natural landscape with an orderly appearance that functions as intended, and has a greater capacity to maximize the level of social, economic, and environmental benefits that can be provided by our natural resources.

While not maintenance-free, natural landscapes often require less time and money for ongoing maintenance than conventional landscapes, and maintenance practices result in less pollution. Because turf area and, in some cases, mowing frequency is reduced, maintenance practices result in less air pollution from mowing equipment. In addition, the increased use of mulch builds soils with a higher percentage of organic matter, resulting in greater water and nutrient holding capacity. This produces healthier plants, reducing the need for fertilizer and pesticides applications that can potentially pollute streams, rivers, and the Chesapeake Bay.

**The Natural Landscape Committee** To facilitate the implementation of its Natural Landscape Policy the county formed the Natural Landscaping Committee (NLC). The committee consists of representatives of those county agencies that have landscape maintenance responsibilities and professionals that have expertise in natural landscaping. The NLC has two functions. It acts in an advisory capacity for the formulation of site-specific natural landscaping plans. It also acts as a gatekeeper recommending natural landscaping projects to the Environmental Coordinating Committee for funding through the Environmental Improvement Program. Each county agency, such as Police, Fire and Rescue, and Library, that occupy county owned properties which may be natural landscaping project sites, should identify a person or office that will serve as liaison with the NLC to help identify potential project sites and work with site staff to implement projects.

A further function of the NLC is to devise procedures by which Fairfax County's Natural Landscaping Policy can be implemented. To that end the NLC has written this manual. It is not the intent of the NLC to duplicate existing efforts in Natural Landscaping and write another technical guide on how to plant a tree, build a rain garden, select habitat plants etc. Therefore the NLC incorporates into this manual by reference applicable sections of the Fairfax County Public Facilities Manual, the EPA Sourcebook on Natural Landscaping for Public Officials, and any other appropriate technical guides to Natural Landscape design. The purpose of this manual is to communicate the County's reasoning for adopting the natural landscaping policy and the philosophy guiding the NLC in implementing the policy.

**Environmental/Social Benefits of Natural Landscaping** Understanding how natural landscaping can help achieve the environmental and social goals listed below can help guide the design of landscaping for a site.

1. **Air quality improvement:** Reducing turf areas reduce emissions from mowing. Trees and other plants absorb air pollutants through their leaves, so using vegetation layers to increase leaf area per square foot of land area reduces air pollution. Trees shading parking lots and streets reduce the amount of heat and volatile organic compounds, which are both precursors to ozone. Evergreen and deciduous trees can be used to block winter winds and summer sun and reduce air pollution by reducing the energy needed to heat and cool buildings.
2. **Resource Conservation:** Native plants are adapted to local conditions and need less maintenance. This saves on energy for mowing; collecting treating and pumping water; and producing and transporting pesticides and fertilizer. As noted above, trees can be used to reduce energy demand for heating and cooling.
3. **Pesticide/Fertilizer Reduction:** Native plants are adapted to this area and local pests, nutrients and rainfall, so they need less maintenance. This means less pesticide and fertilizer. This is particularly true in a naturalized area that is allowed to 'go wild' and the plants are left to care for themselves.
4. **Water quality improvement:** Planted areas, unlike turf and pavement, can slow stormwater runoff and allow it to filter into the soil where pollutants like oil, grease, fertilizer, pesticides, and animal waste are trapped, processed and removed by plant roots and soil organisms. Rain gardens and other bio-retention landscape elements are specifically designed to promote this cleaning action. Slowing stormwater also reduces erosion and the amount of sediment entering streams.
5. **Stormwater Management:** Plant leaves and stems intercept rain and allow it to evaporate before hitting the ground; increasing plant surface area per square foot of land area by layering plants reduces runoff. Planted areas that slow the movement of stormwater help infiltrate stormwater and store it in the ground, rather than allowing it to rush into streams.
6. **Ecosystem Management:** On-site natural landscaping can provide corridors that connect larger patches of natural area, allowing wildlife a way to move between those patches. Natural landscaping also offers food and shelter to wildlife, including pollinators and predators of insect pests.
7. **Resource reduction:** In addition to energy savings, low maintenance natural landscaping can also save staff time. Natural landscaping may also be cheaper to install than high maintenance turf.

8. Aesthetic Improvement: Natural landscaping with native plants can fulfill all the architectural requirements of formal landscaping with non-native species. In places where turf is not required, natural landscaping opens a wide array of native plants that have more interesting texture and color than turf grass.
9. Public Education: Natural landscaping of public facilities can teach the public about the benefits of natural landscaping and encourage its use on private land. Natural landscapes around schools can serve as living laboratories for science education and required significant watershed experiences.
10. Community Engagement: Natural landscaping can be a vehicle to promote civic pride and to engage local grass roots environmental and gardening groups to promote land stewardship and a new suburban landscape ethic.

**The Natural Landscape** The natural landscape of most of Fairfax County is forest. Prior to European settlement in 1607 the Chesapeake Bay watershed, including Fairfax County, was mostly forest. Most sites in the county, if left alone and given time will return to forest. We start our consideration of natural landscaping with forest.

A forest is a collection of plant material that includes the following layers:

1. *Canopy* – trees of 60 or more feet that shade the other layers (e.g. oak, hickory, maple, poplar, white pine)
2. *Under Story* – single stemmed woody plants 20 to 60 feet including small trees and saplings of canopy trees (e.g. redbud, flowering dogwood, American hornbeam)
3. *Shrub* – woody plants, usually multi-stemmed, up to 20 feet (e.g. viburnum, mountain laurel, hazelnut)
4. *Herbaceous* - non-woody plants (e.g. Virginia bluebells, wood poppy, bleeding heart, ferns, mosses)
5. *Forest floor* – accumulating, decomposing organic debris from the other layers mixed to varying extent with mineral soil.

From a landscaping view, natural forests are untidy, random collections of plants. But the concept of a forest can be applied to a planned landscape. For example a 20 foot wide transition/screening strip along one edge of a property might be planted with a row of oaks on 20 foot centers, 5 feet from the property line. Redbud, viburnum, wood poppy are planted among the oaks and the entire strip is covered with 3 inches of shredded hardwood mulch. This may appear to be a well manicured landscape feature, but when mature it will actually be a forest with canopy (oak), under story (redbud), shrub (viburnum), herbaceous (wood poppy) and forest floor (mulch, accumulated leaves and woody debris) layers.

Site considerations may require the elimination of one or more layers. Overhead utilities may restrict the height of the landscaping and remove the canopy and under story. The need to maintain sight lines may remove tall shrubs and under story.

In some cases it may not be appropriate to use any woody vegetation. At these times a meadow is a more appropriate model for the landscape. A meadow is a collection of herbaceous plants –

grasses, sedges, and broad leaved flowering plants. Again, a natural meadow may appear somewhat jumbled and untidy, but the elements can be organized to create a landscape element. A foundation planting that cannot obscure the view from the first floor might include short native grasses that grow in clumps and perennial native flowers that form mounded displays. Over time the clumps and mounds will grow together and form an organized meadow that fills the entire landscaping space.

**Considerations** In installing landscaping, natural or otherwise, there are many considerations. Natural landscaping must fit into the overall site design and purpose. In some cases landscaping fulfills a legal requirement, say for screening and transition between two different land uses. It may also be an integral part of the site architecture like the tree colonnaded approach to the Fairfax County Government Center. Landscaping may also provide a play area for school children or a break area for site staff. Sometimes landscaping is simply used to fill up unused space on the site. Before installing natural landscaping, it must be determined how the landscaping will integrate with the site design and use.

Once it is determined how the landscape fits with the site design and function, there are a variety of cultural and biological considerations that will dictate what is put into the landscape and how it is installed. Security and utilities may constrain the types of plants used; neighborhood expectations of a well manicured site may preclude a naturalized landscape created by a ‘no mow zone.’ Drainage patterns may require more inundation or drought tolerant plants; deer browse may obligate the use of fencing or tree tubes. Below are checklists to help guide the planning process for natural landscaping.

**The Natural Landscaping Planning Process** Natural landscaping is a two tiered planning process. First a conceptual plan is developed that addresses the benefits of, constraints on, and types of natural landscaping to be installed on a site. Once the conceptual plan has been approved and funded through the Natural Landscape Committee, a detailed final plan must be developed specifying exactly how to install the natural landscaping. The final plan may be as simply describing how to identify a “No Mow Zone” to the person running the lawn mower or as complicated as detailing the construction of a rain garden. The Natural Landscaping and Site Assessment Checklists can be used as a guide to writing the conceptual plan.

**Required Elements of a Natural Landscaping Plan**

Element	Description
<b>Site evaluation</b>	<p><b>Function and purpose of the site or facility.</b> Some questions to consider are:</p> <p>What type of facility is this? (School, library, police station etc.)</p> <p>How is the facility used? (Indoor activities only, outdoor active use for play or practice, outdoor passive use etc.)</p> <p>What activities take place there? (Games, education, practice etc.)</p> <p>How do these uses and activities interact with the landscape – do they require fields or open turf areas?</p>

<p><b>Constraints</b></p>	<p><b>Constraints on the type of natural landscaping that can be installed.</b></p> <p>Easements – utility, stormwater, VDOT etc.                  Overhead and underground utilities                  Visibility – will the neighbors complain?                  Rooting space for trees in and around parking lots and sidewalks.                  Sight lines for security or signage.                  Cultural issues identified in the site evaluation.</p>										
<p><b>Site-based and County-wide Objectives</b></p>	<p><b>How the natural landscaping will address both site-based and county-wide objectives.</b></p> <p>County –wide objectives are:</p> <table border="0"> <tr> <td>Air quality improvement</td> <td>Resource Conservation</td> </tr> <tr> <td>Pesticide/Fertilizer reduction</td> <td>Water Quality Improvement</td> </tr> <tr> <td>Stormwater Management</td> <td>Ecosystem Management</td> </tr> <tr> <td>Resource Reduction</td> <td>Aesthetic Improvement</td> </tr> <tr> <td>Public Education</td> <td>Community Engagement</td> </tr> </table> <p>Site-based objectives might be to follow County policy and work towards county-wide objectives. Site-based objectives may also be specific to the function of the site or facility, for example:                  An outdoor classroom at a school; a shaded story time grove at a library; reducing glare on the doors or windows at a police station.</p>	Air quality improvement	Resource Conservation	Pesticide/Fertilizer reduction	Water Quality Improvement	Stormwater Management	Ecosystem Management	Resource Reduction	Aesthetic Improvement	Public Education	Community Engagement
Air quality improvement	Resource Conservation										
Pesticide/Fertilizer reduction	Water Quality Improvement										
Stormwater Management	Ecosystem Management										
Resource Reduction	Aesthetic Improvement										
Public Education	Community Engagement										
<p><b>Proposed Treatments and Specifications</b></p>	<p><b>Details the natural landscaping to be installed.</b></p> <p>Preliminary or conceptual plans should include a description of the practice(s) to be installed and site plan showing the general location and size of the practice(s).</p> <p>Final plans must include the exact location and area of the practice. Where applicable the plan must also include site preparation, plant lists, construction details and specifications, and sign location, specification and verbiage.</p>										
<p><b>Maintenance</b></p>	<p><b>Details the maintenance of the proposed landscaping and identifies the party(s) responsible for that maintenance.</b></p> <p>A schedule of required maintenance activities based on the plant species and landscape elements installed. Where invasive species exist on the site, this section must include a plan for their control. For the purposes of the Fairfax County Natural landscaping initiative invasive species are those identified by the Natural Heritage Program of the Virginia Department of Conservation and Recreation.</p>										

**Evaluating Your Site** Conducting a site-specific evaluation of a property is the first step toward creating a natural landscape. A site assessment allows you to catalogue the considerations, from site design and purpose to security concerns that will influence your natural landscaping plan. Site assessment is a common tool for landscape planning. However, in the natural landscaping context, typical design and horticultural concerns must be weighed against the ultimate goal: creating landscapes that mimic natural communities in both form and function.

The site assessment and natural landscaping assessment checklists below provide a guide for identifying opportunities to integrate natural landscaping into an established landscape, along with the site conditions that will impact that process. Although these two facets of natural landscape planning have been separated in this document, in reality they work together. While you are assessing a parking lot, for example, for potential to add shade trees, often you are also compiling information on site conditions including locations of power lines and underground utilities, noting existing plant materials, soils and slope, etc.

There is no set way to conduct a site evaluation. However, it is always a good idea to plan on visiting the site at least twice. An initial visit can be used as an opportunity to interview a site manager or property owner and often generates the large-scale vision for transforming the site. At the second visit, initial ideas and concepts can be weighed against the reality of the specific site conditions, and refined if need be. Often too, the site evaluation process includes researching local regulations or creating base maps showing, for example, on-site soils, site boundaries, and easements. The checklists should help you identify the questions you should ask of the site manager and of yourself as you re-create a natural landscape.

## **SITE ASSESSMENT CHECKLIST**

### **Design Considerations: Identifying Constraints, Problems and Assets**

Identifying opportunities for installing natural landscaping often also requires identifying those portions of a landscape where constraints limit change. Portions of a site may not be available for retrofit because they facilitate site use and function, contain utilities, or are protected by an easement. The biases and preferences of neighbors or site managers and physical site conditions can also constrain site design. As valuable to identify are both the problems and assets existing on your site. Signs of erosion or standing water are evidence of drainage problems that can be addressed by your natural landscaping plan. Your final plan should also enhance and link existing site assets such as tree resources, existing garden plots, shrub borders, and natural habitats such as wetlands or streams.

To identify the constraints, problems, and assets at a site, make sure to speak with the site manager or maintenance foreman. Address the following questions based on research and site observations. A good idea is to mark or make notes on an aerial photo or site plan delineating areas where no changes are possible or necessary and noting areas for potential enhancement.

### **Site Use/Constraints**

- How is this facility and its landscape currently used? What areas of the landscape are required to support site use?
- Are renovations or changes in function/use anticipated?
- What pathways are present for pedestrians? Are these sufficient?
- What legal requirements affect on-site landscaping?
- Are easements present on the site? Where?
- Where are the utilities, including overhead power lines?
- What are the security mandates/concerns at the site?
- What sight lines or views need to be maintained or emphasized?
- What are the needs for vehicles, including parking?
- What paved surfaces are required to fulfill ADA requirements?
- Is this a historic property?
- Is there any part of the landscaping you absolutely feel can't be changed? Why?
- What about site maintenance, how do you deal with snow/ice?
- Will staff or funds be available for future maintenance?
- What is the project budget?

### **Problems**

- Is there any part of the landscaping you would like to see changed? Why?
- Where are the stormwater structures?
- Are there any drainage problems on the site?
- Is there evidence of erosion? Where? What's the cause?
- Are there down spouts? Where do they empty?
- What is the overall drainage pattern?
- Are invasive plant species present? Which ones?
- Are pests or disease a problem? Which species are affected?
- Is deer browse problematic at the site?

**Assets & Site Conditions**

- Are water resources present on the site (wetlands/streams)?
- Are there any existing Low Impact Development structures?
- Any existing forest or meadow resources? What condition are they in?
- Where are the tree resources on site?
- What other existing vegetation is present?
- Is there an irrigation system in place?
- How can the existing topography be complemented?
- What are the soil characteristics?
- What is orientation of buildings? Do trees provide shade?
- What areas are sunny? Shady?
- What is the dominant wind direction?



## **NATURAL LANDSCAPE ASSESSMENT CHECKLIST**

### **Identifying Opportunities for Change**

Look beyond the current conditions at the site and identify opportunities to create a more sustainable landscape that offers improved ecosystem services. Examine each component of the landscape for opportunities to mimic natural communities and ecosystems functions and/or change maintenance practices.

#### **General**

- Replace non-native exotics with native species to reduce water/fertilizer/pesticide use
- Use integrated pest management (IPM) to deal with pests and disease.
- Recreate forest ecosystems by including multiple layers with over- and understory trees, shrubs, forbs and a mulch layer. Consider natural community composition when choosing a plant palette.
- Link landscape areas to provide corridors for wildlife and limit maintenance.
- Provide adequate maintenance to control invasive plants.
- Right plant, right place (choose appropriate plants for conditions and location, keeping in mind mature size).
- Choose low maintenance plant materials and keep plants with similar maintenance needs together.
- When renovating or installing new planting areas, amend soils to increase water infiltration.
- Install rain gardens or vegetated swales to encourage good drainage.

#### **Pavement/Parking Lots**

- Add trees to shade roadways and parking lots, decrease runoff and improve air quality
- Construct rain gardens (bioretention)/vegetated filter strips to intercept runoff from pavement
- Convert pavement to permeable surfaces in overflow parking spaces, non-ADA specified walkways, and dedicated firelanes.
- Re-direct downspouts away from pavement and into vegetated areas or into rain gardens or rain barrels
- Amend soil in medians to encourage rainwater infiltration
- Where constraints limit tree installation, replace turf with mulch, perennials and shrubs to reduce mowing and add habitat
- Widen/add pathways, driveways or walkways where equipment or pedestrian traffic is causing erosion.

#### **Foundation Plantings/Buildings**

- Maintain proper slope to encourage drainage away from structures
- Add or enlarge foundation plantings to reduce turf/turf maintenance. Where possible recreate forest structure by including multiple layers with over- and understory trees, shrubs, forbs and a mulch layer.
- Plant deciduous trees on the south, east and west sides of buildings to provide shade and ensure air conditioning units are shaded to reduce cooling needs in buildings.
- Plant evergreen trees as a windbreak to conserve heat in winter (typically north or west winds).
- Plant evergreen shrubs 4-5' from buildings for living walls to provide insulation in winter.

- Make sure evergreen trees/shrubs do not block sunlight from entering and warming the buildings (passive solar gain) in winter.
- Install green roofs where feasible to reduce runoff and conserve energy.

### **Turf**

- Minimize lawn! Convert unused/unnecessary turf areas to no-mow-zones. Plant seedlings and perennials or groundcovers, or add woody seed mix where possible.
- For golf courses, increase areas of rough.
- Eliminate turf on steep slopes where it is difficult to maintain. Terrace and plant shrubs and perennials and mulch, or plant with native groundcovers, shrubs or grasses that provide erosion control.
- Eliminate turf areas too narrow to mow with larger, more efficient mowers.
- Eliminate turf in shaded areas to reduce inputs of chemicals and reduce maintenance. Replace with a shade resistant groundcover or mixed shrub planting.
- Eliminate ineffective edging or unneeded structures that impede efficient mowing.
- Reduce mowing frequency particularly in summer to reduce emissions.
- Use efficient mowers and maintain proper blade height and sharpness
- Apply appropriate fertilizer/lime and aerate and overseed annually to maintain lawn health and reduce disease.
- If possible, re-locate signage to encourage efficient mowing/proper fertilization practices (no fertilizer/grass clippings on pavement).

### **Natural Areas**

- Protect and enhance or re-establish riparian buffers.
- Protect and enhance existing woodlands.
- Protect and enhance wetlands.
- Protect and enhance conservation areas (easements).
- Link natural areas to provide corridors for wildlife.

**ADDITIONAL CONSIDERATIONS**

**Identifying Contingencies Associated with the Design/Implementation of this Project**

Consider the steps that will be required to prepare the plan for implementation. What approvals will be required? What County agencies need to be involved? Will the site function as intended?

- County permitting is required
  - Land disturbance totals more than 2500 square feet
  - Project is directly associated with riparian buffers, stream valleys, or floodplains
  - Existing topography is altered and current drainage patterns changed
  - The project includes stormwater BMPs or any kind of LID
  - Man-made water features (lakes or ponds) of significant size are proposed in the plan
  - Building structure is to be altered or modified to accommodate the project
  - Miss Utility indicates major utilities in the proposed construction area
  
- Land disturbance requires use of heavy or specialized construction equipment
- Primary site use is significantly changed
- Project meets the requirements of the funding source
- Multiple County agencies will be involved in implementation of the project
- Maintenance specifications are included with the plan
- Natural landscaping goals achieved are indicated on the plan