

# StormwaterWise Landscapes: Conservation Landscaping Specifications

## Purpose & Benefits

- Pollinator & wildlife habitat
- Attractive landscaping feature, with native flowering plants
- Stormwater runoff and pollution reduction
- Reduce water, pesticide and fertilizer use; less time and money spent on these inputs
- Promotes healthy soils & air quality
- Replace invasive plants with native plant options
- Less maintenance in the long-term

## Description

Conservation landscapes feature native plants and trees, many of which flower at different times during the growing season. Unlike many traditional landscaped areas, conservation landscapes are situated slightly below the existing ground level so runoff from rooftops, driveways, and surrounding yard areas can spread out and soak into the landscaped area. Native plants provide habitat for beneficial pollinators and songbirds, and, once established, do not require chemical fertilizers, pesticides or excess watering. The deep roots of most native plants, and associated healthy soils, allow runoff to soak into the ground at a much higher rate than traditional lawns. In yards with poor soil, compost amendments can enhance stormwater infiltration capacity of conservation landscapes.

## What to Expect

Native plants used in conservation landscapes come in a variety of shapes, colors, and sizes. The design of the landscape can match the aesthetic preferences and maintenance skills of the property owner. Designs can range from natural-looking meadows or wooded strips to more traditional mulched landscape beds. Generally, conservation landscapes require a similar level of maintenance as what is needed for conventional landscape beds, and often less.



## 1. Submittals

The following items must be submitted to the Arlington County StormwaterWise program as part of a conservation landscaping implementation project.

### Pre-Construction:

- Site Plan - Plan view of the site, depicting the dimensions and square foot area of the proposed conservation landscaping area.
- Planting Plan - Plant list (with Latin names) and planting plan. Include the number of plants of each species to be installed. (Note: Any modifications to an approved planting plan due to lack of plant availability or cost must be submitted to the County representative for approval prior to installation.)
- Soil amendment documentation – Type of soil amendment which will be used on your project (i.e., LeafGro, SoilMate).

### Post-Construction:

- Photograph of the soil amendments and tilling in progress.
- Photograph of the completed conservation landscape.

## 2. Materials

Table 1 provides a list of materials needed for constructing a conservation landscape. Note that some of these materials are optional, based on site conditions.

**Table 1. Material Specifications for Conservation Landscaping**

<b>Material</b>	<b>Specifications</b>	<b>Size</b>	<b>Depth</b>	<b>Notes</b>
<b>Soil Amendment (Compost or Leaf Mulch) [Required]</b>	The material should be well composted and free of viable weed seeds  Fresh manure should not be used for compost because of high bacteria and nutrient levels	N/A	Add 2 – 4 inches of compost across landscape surface area and tilled into the top 6 inches of soil	If a special soil test is conducted follow the recommendations to improve the soil  Approved products are SoilMate and LeafGro
<b>Soil mix (Optional)</b>	Rain garden soil mix from vendor or sandy loam topsoil	N/A	Replace existing soil to a depth of approximately 12 inches	Recommended if existing soil is full of rock or construction debris, or otherwise has poor infiltration rates
<b>Mulch [Required]</b>	<i>Options:</i> double-shredded hardwood mulch or leaf mulch	N/A	2 – 3 inches	Mulch should be aged a minimum of 6 months
<b>Cobble/Stone (Optional)</b>	Washed river rock, large gravel, or small rip-rap  Filter fabric underlayment (non-woven preferred)	3 – 5 inch diameter stone	1 or 2 layers deep	Use at downspouts, inlets, and where landscaping meets hardscape areas as needed to dissipate flow and prevent soil erosion  Install filter fabric secured with landscape staples below the stones to keep them in place and to prevent weed growth

### 3. Location, Feasibility, and Design

The following must be considered when installing conservation landscaping:

**Location** - If possible, conservation landscapes should be located so they will receive some runoff from uphill impervious surfaces, such as a rooftop or driveway, and surrounding yard areas. However, this is not an absolute necessity, and very successful conservation landscapes can be installed simply to replace existing turf or other land covers. If installing a conservation landscape near a downspout, consider also installing a rain barrel or cistern on the downspout to slow water before it enters the conservation landscape. The rain barrel or cistern can be adjusted to allow water to drain out slowly over approximately two days. Doing so will increase infiltration of the roof runoff.

**Size** - Conservation landscapes must be a minimum of 150 square feet for a residential project, 300 square feet for an HOA project. Yards with large open spaces may be more suitable for uniform meadow plantings that can be mowed annually, while small sections of yard may be more appropriate for plantings in mulch beds that can be maintained by hand.

**Setbacks** - Conservation landscapes can be installed adjacent to house foundations or other structures. However, the surface of the conservation landscape should slope away from the structure to ensure that stormwater will not get into the foundation. If the building's downspouts discharge roof runoff onto the ground (i.e., they are "disconnected" rather than piped directly to an underground storm water drain), it is recommended that downspouts extend 5 feet from foundations and 10 feet if a basement is present.

**Proximity to Utilities** - Always call Miss Utility before digging. Most conservation landscapes will disturb the uppermost 6 to 12 inches of the soil, and may interfere with shallow utilities. Also, be aware that Miss Utility may not always mark private cable, propane, and similar lines, so some additional site work may be necessary to locate these.

**Soils and Soil Amendments** - Conservation landscapes can be tailored to any soil type. A soil test can help determine plants suitable to the site and what types of amendments (e.g., compost, lime) may be needed to improve the fertility of the soil for plant growth and infiltration of water into the soil. See the Virginia Tech Soil Testing Lab web page for more information on soil tests: <http://www.soiltest.vt.edu/index.html>. A soil test is not required, but it is highly recommended.

Till in 2 – 4 inches of soil amendment to a depth of 6" – 8". Compacted or heavy clay soils should be amended with compost as well and tilled to re-introduce space between the soil particles and improve infiltration.

**Excess Soil** - The plan for construction should address the excess material as needed. Several options may be available: 1) keep it on site for future use, such as for raised garden beds or fill (cover with tarp to avoid erosion); 2) offer it for free through local or online classifieds; or 3) haul it to an appropriate local landfill, which will likely charge a fee. The designer should specifically discuss this with the homeowner to decide which option works best.

**Erosion Control** - If the conservation landscape receives stormwater directly from gutter downspouts, the design will need to incorporate a pad of cobble stone (sometimes called river rock, or river jack) or some other means at the mouth of the downspout to reduce flow velocity and prevent erosion. Where a conservation landscape is located next to a sidewalk, patio or driveway, consider including a similar treatment or a grass strip to prevent erosion at the edge where the bed meets the hardscape until the plant material is established and mature.

In addition, depending on the size of the installation, it is important to consider the weather and anticipate the number of days needed for the installation. It may be advisable to place a silt fence downhill from the conservation landscape excavation and/or stockpiles of excavated material if the installation exceeds more than a few days. Take all precautions necessary to not allow sediment to flow off site to downhill storm drainage systems and waterways.

## 4. Plants

**Plant Species**– The StormwaterWise program will only reimburse for native plants, and non-native plants may not be planted as part of a conservation landscape. Native plant species with high habitat value, suited to site conditions, and planted in layers and zones of similar native plant communities should be used.

**Plant Coverage** - The planting plan should aim for 100% coverage at maturity. Aim for about one plant every 2 square feet for herbaceous plants, with more space provided for trees and shrubs. It is important to take into account conditions at the site, such as exposure to sun, soil type, moisture, aesthetics, and wildlife objectives

when selecting the appropriate plant species for a conservation landscape.

**Planting Plan** – A “To Scale” Planting Plan should be submitted. The Plan should show all dimensions and the layout including existing vegetation; proposed plant locations, stone, and any other components important to the design. The Plan should also show the total project square footage.

**Plant Heights** – When choosing where to install conservation landscapes and which native plants to use, consider the typical maximum height for each type of plant. Certain tree species, for example, may grow quite tall and shade out other plants, block views, and get in the way of aerial electric and cable wires. Landscaped areas next to driveways or parking areas should not block ingress and egress or sightlines.

Some common conservation landscape planting strategies include:

**Tree, shrub and herbaceous plants/grasses** – These have a balanced mix of plant types for variety and cooperative function. They can produce a natural effect, simulating the structure and function of a native forest plant community. This planting strategy requires regular maintenance in the form of weeding, thinning, pruning, mulching, and other activities that are routine for other landscaped areas.

**Simple meadow** - This is a lower maintenance approach that focuses on the herbaceous layer and may resemble a wildflower meadow. The goal is to establish a more natural look, and, once the grasses are established, maintenance can largely consist of mowing the area annually in the early spring.

**Flowering tree focal point garden** – A small or medium tree is accented with perennials/herbaceous plants. This garden may have more mulched areas than other options, so weeding and re-mulching would be expected.

**Butterfly garden** – Largely a modification of the tree, shrub, herbaceous option, but with plants selected for pollinators and wildlife.

**Woody screen** – Some conservation landscapes can be naturalized screens, consisting largely of trees with understory shrubs and ground covers. The idea is to create a property screen or a natural buffer area along streams, swales, wetlands, or other natural areas. Once established, maintenance would consist of periodic thinning and control of invasive plants.

**Hybrid** – There are many options for conservation landscape concepts. The designer may mix and match the concepts above or design something suited to the particular property.

**Planting Season** – In general, it is best to plant trees and shrubs in early fall or early spring. Planting dates for herbaceous plants and grasses are more flexible; these plants can be installed throughout spring and fall. Planting in mid-summer is not recommended, but can be successful if sufficient water is provided.

## 5. Construction

**Step 1 – Call Miss Utility** - Call Miss Utility before any excavation and also check for private cable, propane, electric, and other lines. Also try to identify private propane, cable, electric, and other small lines. Make sure to have a plan and phone numbers of who to call in case there is any damage to utilities.

**Step 2 - Outline the conservation landscape area:** Mark the boundaries of the conservation landscape.

Also mark areas that should not be disturbed during installation (e.g. environmentally sensitive areas, soil around root zones of mature trees, and existing vegetation).

**Step 3 – Remove the Turf:** If turf grass needs to be removed, several methods can be used, as outlined below. These “physical” methods are preferable to using herbicides, since the intention of the practice in the first place is to protect water quality.

- (1) Sheet mulching - Using cardboard or sheets of newspaper to smother and kill the grass.
  - First, cut the grass as short as possible and water down the area well.
  - Lay down the cardboard or newspaper (about 10 sheets thick) like shingles, with some overlap. If there is a breeze, water down the paper to keep it from blowing away.
  - Add a layer of 3 – 5 inches of mulch on top of the paper to keep it in place.
  - Wait 2 – 4 months to allow the grass to die off. When ready to install the conservation landscape, remove the sheet mulch or install potted plants (or plugs) directly by cutting holes into the newspaper or cardboard.
  
- (2) Solarizing - Using stapled down sheets of black or clear plastic over the grass. Over time, heat from the sun will kill the grass. Remove the plastic before planting. As with sheet mulching, be sure to start the process at least two months in advance of installing the conservation landscape to allow time for the grass to die off.
  
- (3) Mechanical methods - Using a sod cutter to remove turf or using shovels to cut out grass roots by hand. This method is needed if grass is not killed in advance.

**Step 4 – Remove Excess Soil:** Most conservation landscapes will match the existing topography of the land. If possible, the surface of the conservation landscapes should be a few inches lower than the surrounding area, so that water flows into the landscaping area. As mentioned earlier, the design should account for removal and disposal or reuse/composting of any soil and/or turf grass. When grading the area to achieve the desired final elevations and slopes, avoid compacting the soil with heavy equipment.

**Step 5 – Amend the Soil:** Till the area to be planted to a depth of approximately 6 to 12 inches, using a rotary tiller (or, for small areas, by hand using shovels and forks). Add 2-4 inches of a suitable compost mix or leaf mulch evenly across the conservation landscape while tilling. The soil amendment process is a critical and a REQUIRED step to improve the soil's ability to infiltrate water. If the conservation landscape is located within a tree's dripline, only add a top dressing of compost.

**Step 6 – Install Stone, if applicable:** If the volume and speed of water flowing into the landscape appears to have the potential to cause erosion, add cobble stone at downspouts and any other inlets or edges where water is concentrated.

**Step 7 – Install Plants and Mulch:** Install native plants per the plan and per the grower's instructions, aiming for about one plant every 2 square feet for herbaceous plants, with more space provided for trees and shrubs. The planting plan should aim for 100% coverage at maturity. Add 2 – 3 inches of hardwood or composted leaf



mulch around the plants to retain soil moisture and reduce weed growth.

**Step 8 – Water:** Water plants immediately, then approximately once every three days for the first month (depending on rainfall). A good rule of thumb for hand watering is to count 30-45 seconds on each tree, 20 seconds on each shrub and 10 seconds on each perennial and then repeat. It is also helpful to set up a timer to a hose and sprinkler. Set the timer for the early mornings (i.e., 5:30am). Drip irrigation is also a terrific way to conserve water and kits are readily available on the market (nurseries, box stores and on-line). Avoid watering in the evenings as it promotes mold on plant leaves.

## 6. Maintenance

Maintenance of conservation landscapes is very similar to the maintenance of traditional landscape beds. Those performing maintenance on conservation landscapes need to be able to differentiate between native plants and non-native plants to know which are desirable and undesirable. The following maintenance should be performed to keep conservation landscapes functioning properly:

- During the first few months, water new plants to ensure establishment. New trees should be watered during dry periods for the first two years following installation.
- In the spring or fall, replace dead plants and divide plants that are exceeding their allotted space.
- Do not add chemical fertilizers, herbicides or pesticides.
- Remove any weeds by hand pulling. Dispose of weeds in the trash – do not compost.
- Check for signs of erosion and address as needed by adding cobble or gravel (and a filter fabric underlayment).
- For “meadow” type conservation landscapes consisting of grasses, mow to 6-8 inches in early spring.
- For other types of landscapes, check for winter damage and add mulch to bare spots as desired (2–3 inches)
- Trees and shrubs may need occasional pruning and perennials may need deadheading, depending on species.
- Keeping seed heads on plants through the winter can provide additional habitat value for birds.

## 7. Resources

Alliance for Chesapeake Bay, *BayScapes Homeowners' Guide to Designing Your Property*. Available at: <http://allianceforthebay.org>

Chesapeake Conservation Landscaping Council, *Conservation Landscaping Guidelines: The Eight Essential Elements of Conservation Landscaping*. Available at: <http://www.chesapeakelandscape.org>

U.S. Fish and Wildlife Service, *Native Plants for Wildlife Habitat and Conservation Landscaping*. Available at: <http://www.nps.gov/plants/pubs/chesapeake/>

Virginia Cooperative Extension, *For the Birds, Butterflies & Hummingbirds: Creating Inviting Habitats*. Available at: ([www.pubs.ext.vt.edu/HORT/HORT-59/HORT-59.html](http://www.pubs.ext.vt.edu/HORT/HORT-59/HORT-59.html)).