The Monthly Dirt
A monthly newsletter on the California Construction General Permit

VEGETATION PRESERVATION

A BMP SPOTLIGHT

Preservation—not just for delicious jams and jellies...

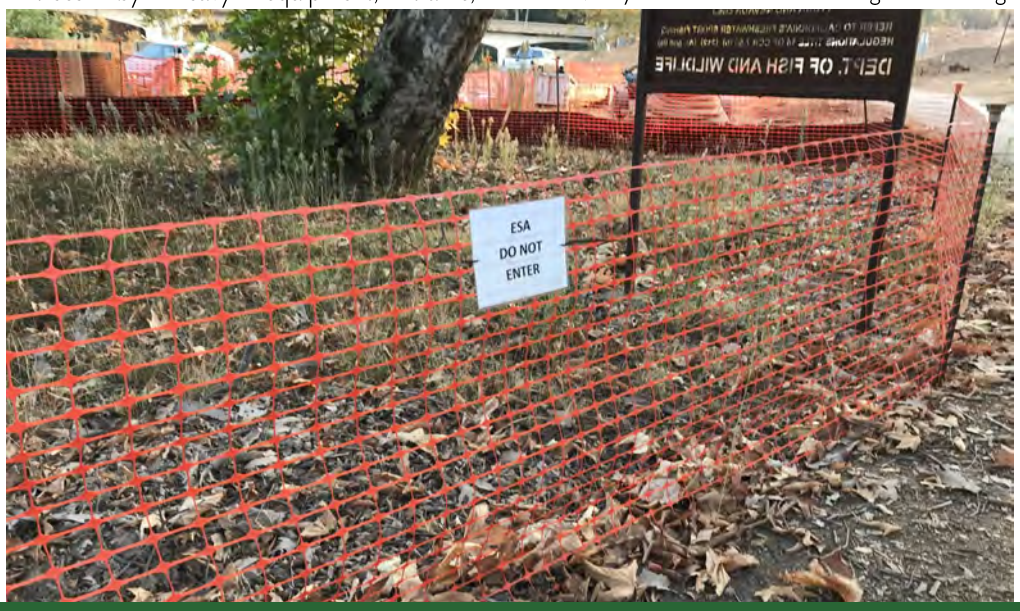
When it comes to preservation, jams and jellies aren't the only blue-ribbon winner categories in preserves. Vegetation preservation is not only beneficial for the environment, but in the long run, can actually save your project money down the road. In this month's edition of **The Monthly Dirt,** we're going boil down the basics of vegetation preservation so that hopefully your site can get the blue ribbon! *(If you didn't get any of those puns/references, ask your grandmother about preserves and blue ribbons, she might have a few stories about that!)*

Vegetation Preservation – More than "oh that tree looks nice, let's save it!", vegetation preservation is a well thought out plan created by the project owner or developer. "Planning should include consideration of ***how much disturbance is necessary.*** All projects should minimize disturbed areas. In some cases, there are areas in the work zone where work can progress with only vegetation removal. Mowing or string-trimming vegetation and leaving cuttings in place can protect soil and keep a native seedbank available to the project. Vegetation often returns with minimal extra effort. When trimming vegetation, it is important to remove trimmings from areas where they can easily wash into storm drains or receiving waters."[1] Plus, when the new Construction General Permit takes effect, vegetative buffers/preservation will be required for near water work — *"dischargers shall provide and maintain natural buffers and/or equivalent erosion and sediment controls when a water of the U.S. is located within 50 feet of the site's earth disturbances, unless infeasible."* (Attachment D II.G)

According to the BMP cutsheets, vegetation preservation is a useful erosion control BMP which doesn't necessarily take a lot of effort. This BMP aims to minimize disturbance or injury to vegetation which is already on site. Existing trees, grasses, and plants protect soil from erosion, so preserving those natural BMPs will in turn reduce the amount of man-made stabilization your site needs. "Construction staff can preserve natural or existing vegetation at any construction site where vegetation exists in the predevelopment condition. This practice can be particularly beneficial for floodplains, wetlands, perennial and intermittent streams, environmentally sensitive areas, steep slopes, and other areas where erosion controls would be difficult to establish, install or maintain (SPU, 2017)." [2]

Vegetation Preservation Recipe For Success:

- Mark areas to be preserved with temporary fencing to prevent damage to vegetation or trees by heavy equipment, traffic, compaction, or trenching soil disturbance damage. The orange ESA fencing is a great choice since it's visible and cost effective.
- Minimize disturbance of protected areas. Grasslands, wetlands, and hillsides are delicate ecosystems in comparison to construction activities. Minimizing activities done in those areas will preserve their natural conditions.
- Keep construction activities away from tree drip lines. "The dripline is the area directly located under the outer circumference of the tree branches. When the tree canopy gets wet, any excess is shed to the ground along

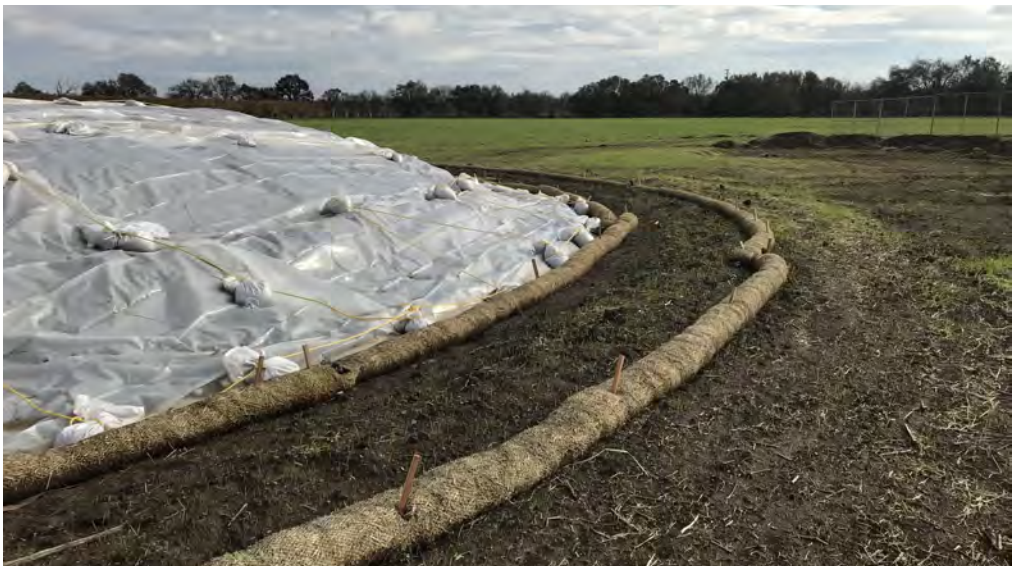


this dripline, much like an umbrella. This is also known as a tree's Critical Root Zone (CRZ), sometimes also called the Root Protection Zone (RPZ). It is defined as a circle on the ground corresponding to the dripline of the tree. The most active water absorption area is at the dripline and beyond, not close to the center or trunk. This is where the tiny terminal feeder rootlets are located that take up water and nutrients from the soil for the tree."[3]

- Be a good arborist. Trench as far away from tree trunks as possible. Cleanly cut through tree roots if necessary. Keep roots covered with soil. Aerate compacted soil or tamp loose soil in trenches so as not to allow excessive air space in the soil which can damage roots.
- Fertilize stressed or damaged trees in the fall or spring to help trees thrive.

While vegetation preservation is a great BMP, sometimes it's not feasible for a specific site. For instance, "Several factors can limit the practicality of preserving natural or existing vegetation throughout the development process. First, the practice is only suitable for sites with ample existing stands of healthy vegetation. In many urban areas, existing vegetation may be patchy and unhealthy, providing little overall benefit to site hydrology or aesthetics. In these cases, new vegetation may provide greater benefit. During planning, design engineers should consider the footprint of proposed structures relative to the total footprint of the site; for high-density development or where land prices are high, preserving existing vegetation may not be cost-effective. During construction, staff may need to remove existing vegetation that would interfere with the maneuverability of construction equipment."[4]

Soil Preservation – Proper preservation of soil during construction projects is equally important. In *Issue # 3 of the CGP Review* (the State Water Board's periodic newsletter prepared by the Construction General Permit Training Team), there is an article which provides information on "Stockpiling for Restoration". The main point of the article highlights how topsoil is supposed to be stored. Often the first thing to go into the stockpile (which ends up getting buried on the bottom) is the topsoil which is rich in organic material, native seed, and beneficial soil microorganisms. If this fertile soil is not placed in a segregated stockpile it often becomes fill soil which is then covered by relatively infertile, non-organic containing soil. No wonder why hydroseeding and revegetation sometimes struggles to take root. For this reason, the State Water Board really encourages the practice of stockpiling of these fertile topsoils separately from the other soil and carefully managed so as to ensure an ideal climate for soil health *("Rolled erosion control products (RECPs) or temporary vegetation cover is better than impervious covers because impervious covers can kill native seed stock that is already in the ground by increasing soil temperatures and can reduce soil quality by preventing exposure to rainfall which is necessary to maintain healthy soil biota. If an impervious cover is used, raise the cover off of the soil by a few inches to allow air exchange into the soil. This will prevent anaerobic organisms (pests) from dominating. Also, when the stockpile soil is returned to the site, add compost amendments that contains an abundance of beneficial soil biota to aid in revegetation efforts."[5])*. In fact, the proposed new permit has a whole section that will regulate the proper segregation and re-use of topsoil. It should be noted that, according to the third point of the CGP requirements, topsoils and mulches ought to be stockpiled differently. The American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence website recommends the stockpiling and reuse of native soils where practical. So, what's the difference between a regular stockpile and a topsoil stockpile? Aren't they both stockpiles containing dirt? Think again! Because of the fertile condition of most topsoil, when creating a topsoil stockpile, the mound should be no higher than 4 feet high for less than 6 months and covered to prevent soil erosion and contamination by weeds. Stockpiling topsoil for more than six months can disrupt beneficial soil microorganisms especially in the top one-foot layer of the stockpile. Which is why, prior to use, the top one foot of stockpiled material should be mixed with the remainder of the stockpile to ensure that living organisms are evenly distributed throughout the material.



Money Preservation – This BMP selection is actually quite cost effective. Other than the cost of the ESA fencing, the cost of preserving vegetation is minimal and offset by the natural beauty which enhances property values. According to the CASQA cutsheet EC-2, "*During construction, the cost of preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area*. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of $10,000 per tree." (CASQA EC-2)[6] In other words, it's cheaper to leave as much natural vegetation alone than to disturb all of the site and have to stabilize it. Preserving vegetation, topsoil, and your bank account by utilizing this BMP is a great recipe for a blue ribbon construction project!

[1] https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/training/cgp_review_issue3.pdf

[2] https://www.epa.gov/system/files/documents/2021-11/bmp-preserving-natural-or-existing-vegetation.pdf

[3] https://www.thespruce.com/dripline-3269491#:~:text=The%20dripline%20is%20the%20area,Root%20Protection%20Zone%20(RPZ)

[4] https://www.epa.gov/system/files/documents/2021-11/bmp-preserving-natural-or-existing-vegetation.pdf

[5] https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/training/cgp_review_issue3.pdf

[6] https://www.casqa.org/resources/bmp-handbooks

Please contact us if you have any questions ...

The Monthly Dirt

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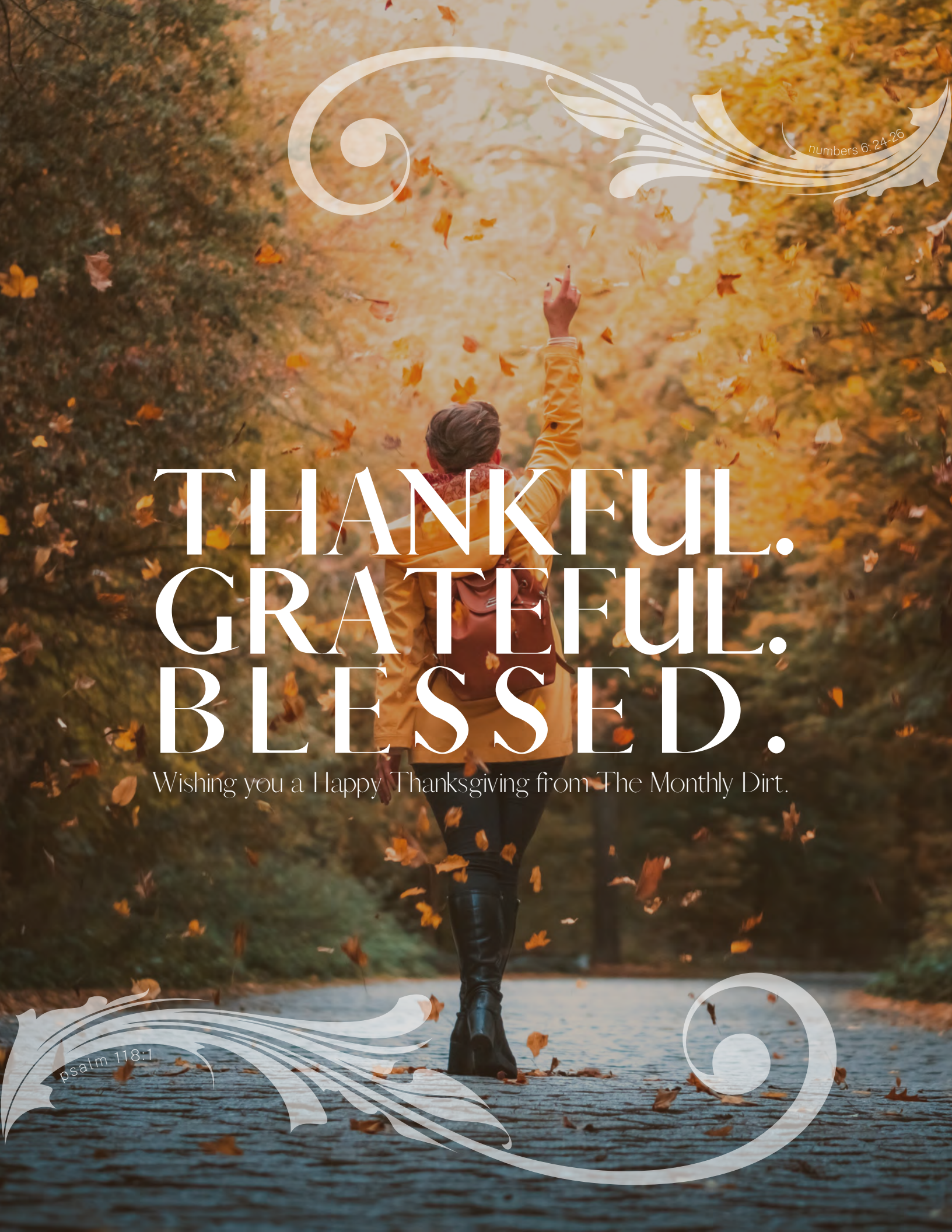
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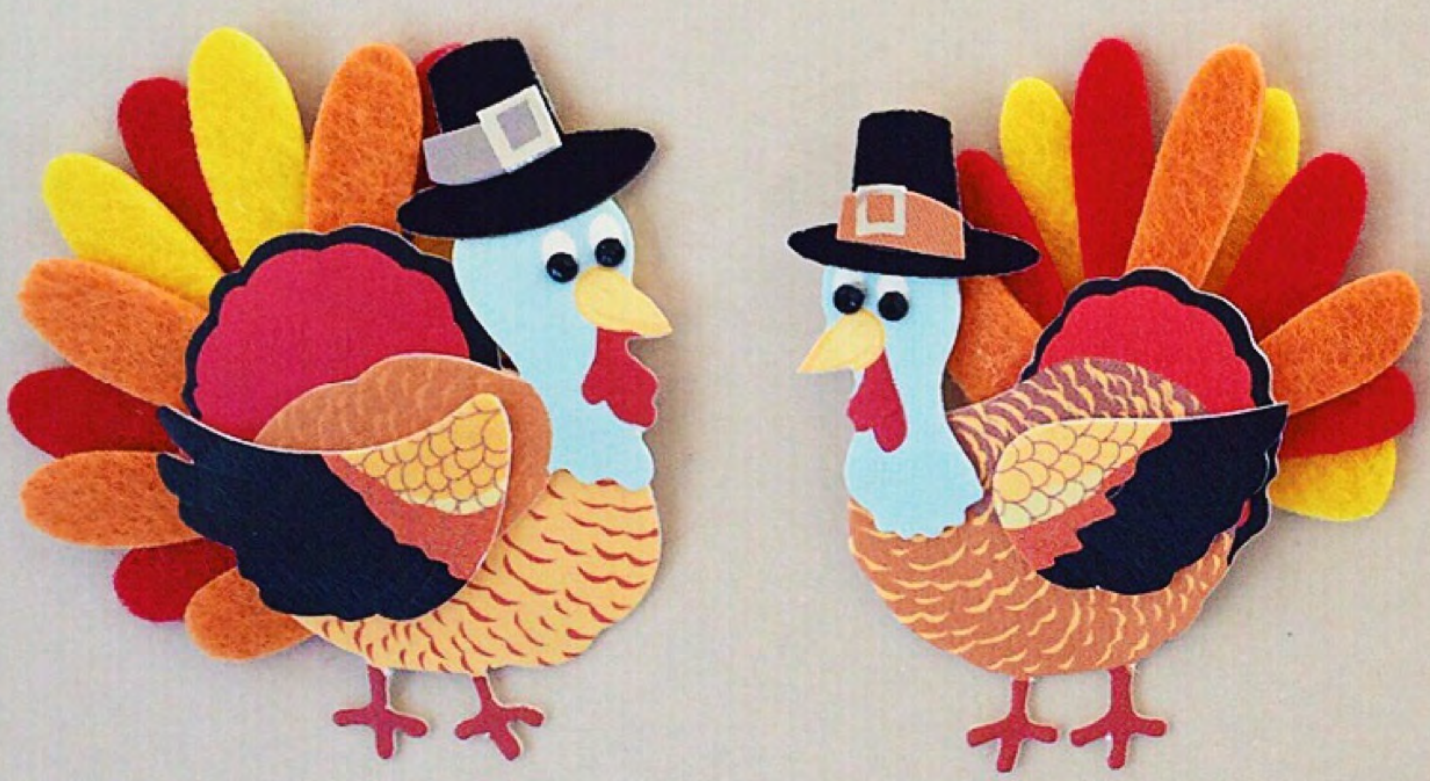
GRATEFUL.
BLESSED.
Wishing you a Happy Thanksgiving from The Monthly Dirt.
psalm 118:1

~~Turkey~~ FORGE Sale



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Stormwater Best Management Practice

Preserving Natural or Existing Vegetation

Minimum Measure: Construction Site Stormwater Runoff Control
Subcategory: Construction Site Planning and Management

Description

Preserving natural or existing vegetation is the practice of protecting desirable trees, vines, bushes and grasses from damage during project development. This practice has benefits during and after construction because natural, existing or established vegetation generally:

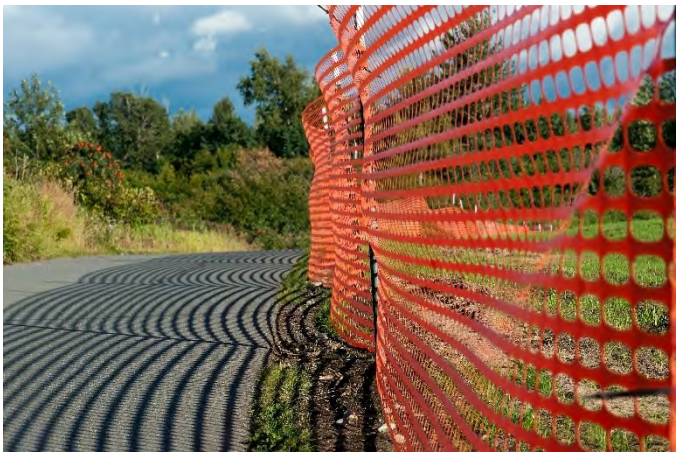
- Can withstand greater quantities of stormwater flow than newly seeded areas.
- Does not require time to establish.
- Has a higher infiltration capacity than newly planted vegetation due to a more developed and deeper root structure.
- Reduces stormwater discharge through greater interception and evapotranspiration.
- Buffers and screens against noise and visual disturbance.
- Provides habitat for wildlife.
- Improves air quality.
- Usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Enhances aesthetics.

Applicability

Construction staff can preserve natural or existing vegetation at any construction site where vegetation exists in the predevelopment condition. This practice can be particularly beneficial for floodplains, wetlands, perennial and intermittent streams, environmentally sensitive areas, steep slopes, and other areas where erosion controls would be difficult to establish, install or maintain (SPU, 2017).

Siting and Design Considerations

As part of the project planning phase, design engineers should visit the site to identify and map site features that may influence natural or existing vegetation stabilization measures such as drainage ways, highly erodible soils and steep slopes (MDE, NRCS, & MASCD, 2011). They should prepare a site map with the location and extent of trees, environmentally sensitive areas, and buffer zones to be preserved. They should also plan the locations of roads, buildings and other structures to avoid sensitive areas. Before clearing activities begin, construction staff should clearly mark the vegetation and other natural features that are to be preserved. Successfully preserving natural or existing vegetation requires careful site design and construction management to minimize the impact of construction activities on existing vegetation.



A construction safety fence preserves existing grass near a paved area.

Direct contact and adjacent compaction, filling or excavation activities can damage trees and other vegetation (SPU, 2017). Therefore, construction staff should protect large trees near construction zones, as damage during construction could result in reduced vigor or death after construction ends. It is important to extend and mark the boundaries around contiguous natural areas and tree drip lines to protect the root zone from damage. Construction staff should clearly set limits using orange safety fence and signs spaced 100 feet apart (WES, 2008). Design engineers should consult local regulation and design standards for buffer zone width requirements near streams and other environmentally sensitive areas.

EPA-832-F-21-028G
December 2021

A certified arborist can help inform the choice of which trees to preserve, offering information on the following sorts of factors:

- *Tree vigor*. Preserve healthy trees that are less susceptible to damage, disease and insects. Indicators of poor vigor include dead branch tips, stunted leaf growth, sparse foliage and pale foliage color. Hollow, rotten, split, cracked or leaning trees also have a lesser chance of survival.
- *Tree age.* Choose older trees because they are more aesthetically pleasing as long as they are healthy.
- *Tree species.* Preserve species that are well suited to present and future site conditions. Keeping a mixture of evergreens and hardwoods can help conserve energy—specifically, keep evergreens on the northern side of the site to protect against cold winter winds and keep deciduous trees on the southern side to provide shade in the summer and sunshine in the winter.
- *Wildlife and aquatic species benefits.* Choose trees that wildlife prefer for food, cover and nesting. Protect low-hanging trees, bushes and grasses, which provide habitat for fish in streams.

Other considerations include following natural contours and maintaining preconstruction drainage patterns. Altered hydrology may no longer meet the environmental needs of preserved vegetation, which could lead to its death (SPU, 2017).

The following are best practices for preserving natural or existing vegetation:

- Do not nail boards to trees during building operations.
- Do not cut tree roots inside the tree drip line.
- Use barriers to prevent equipment from approaching protected areas.
- Keep equipment, construction materials, topsoil and fill dirt outside the limit of preserved areas.
- Keep the duff layer (partially decomposed organic matter), native topsoil and natural vegetation undisturbed to the maximum extent practicable (SPU, 2017).
- Consider assigning a monetary value for trees or vegetated areas and visibly post this value on fencing (SPU, 2017).
- If construction activities damage a tree or shrub marked for preservation, remove and replace it with a tree of the same or similar species with a 2-inch or larger caliper width from balled and burlap nursery stock when construction is complete.
- During final site cleanup, remove barriers from around preserved areas and trees.

Limitations

Several factors can limit the practicality of preserving natural or existing vegetation throughout the development process. First, the practice is only suitable for sites with ample existing stands of healthy vegetation. In many urban areas, existing vegetation may be patchy and unhealthy, providing little overall benefit to site hydrology or aesthetics. In these cases, new vegetation may provide greater benefit. During planning, design engineers should consider the footprint of proposed structures relative to the total footprint of the site; for high-density development or where land prices are high, preserving existing vegetation may not be cost-effective. During construction, staff may need to remove existing vegetation that would interfere with the maneuverability of construction equipment.

Maintenance Considerations

Even if workers take precautions, some damage to protected areas might occur. If this happens, construction staff should repair or replace damaged vegetation immediately to maintain the integrity of the natural system. They should also consider enhancing the preserved area (e.g., removing invasive species). If fertilization is needed, construction staff should minimize adverse water quality effects by using the following practices (MPCA, 2019):

- Apply fertilizers to the minimum area needed.
- Apply fertilizer in lower amounts and more often if necessary.
- Work the fertilizer deeply into the soil (without harming root structures) to reduce nutrients' exposure to stormwater.
- Limit hydroseeding (i.e., simultaneously applying lime and fertilizers).

- Ensure that erosion and sediment control practices are in place to prevent stormwater from transporting fertilizers and sediments off-site.
- Inspect fencing and signs to ensure they are secure and undamaged.
- Do not mow protected areas.

Effectiveness

Preserving natural or existing vegetation can provide water quality benefits by reducing the quantity and improving the quality of stormwater discharge that a construction site generates. The overall effectiveness varies depending on the size of the area preserved, the type of vegetation and the amount of stormwater directed to the preserved area. Table 1 lists load reductions from several practices that are similar to the conservation of natural or existing vegetation. Although they are specific to the Chesapeake Bay region, they provide an approximation of the range of effectiveness that could be achieved by these practices in other locations.

Table 1. Range in annual load reductions provided by natural vegetation buffers.

Buffer Practice	Units	Total Nitrogen	Total Phosphorus	Total Suspended Solids
Forest buffer	lb/acre of buffer	5.9–12	0.36–1.5	120–1,500
Conservation landscaping practices	lb/acre treated	2.2–4.8	0.070–0.23	NA
Filter strip	lb/acre treated	1.1–2.5	0.15–0.49	68–900

Source: CPB, 2018

Cost Considerations

When implemented successfully, preserving natural or existing vegetation is a low-cost practice. Damaging existing vegetation (and needing to replace it) can increase costs. Preserving natural or existing vegetation can also require additional labor costs to maneuver around trees or protected areas.

Additional Information

Additional information on related practices and the Phase II MS4 program can be found at EPA's National Menu of Best Management Practices (BMPs) for Stormwater website

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