Sustainable Landscapes

Community Open Space Workshop

April 16, 2020

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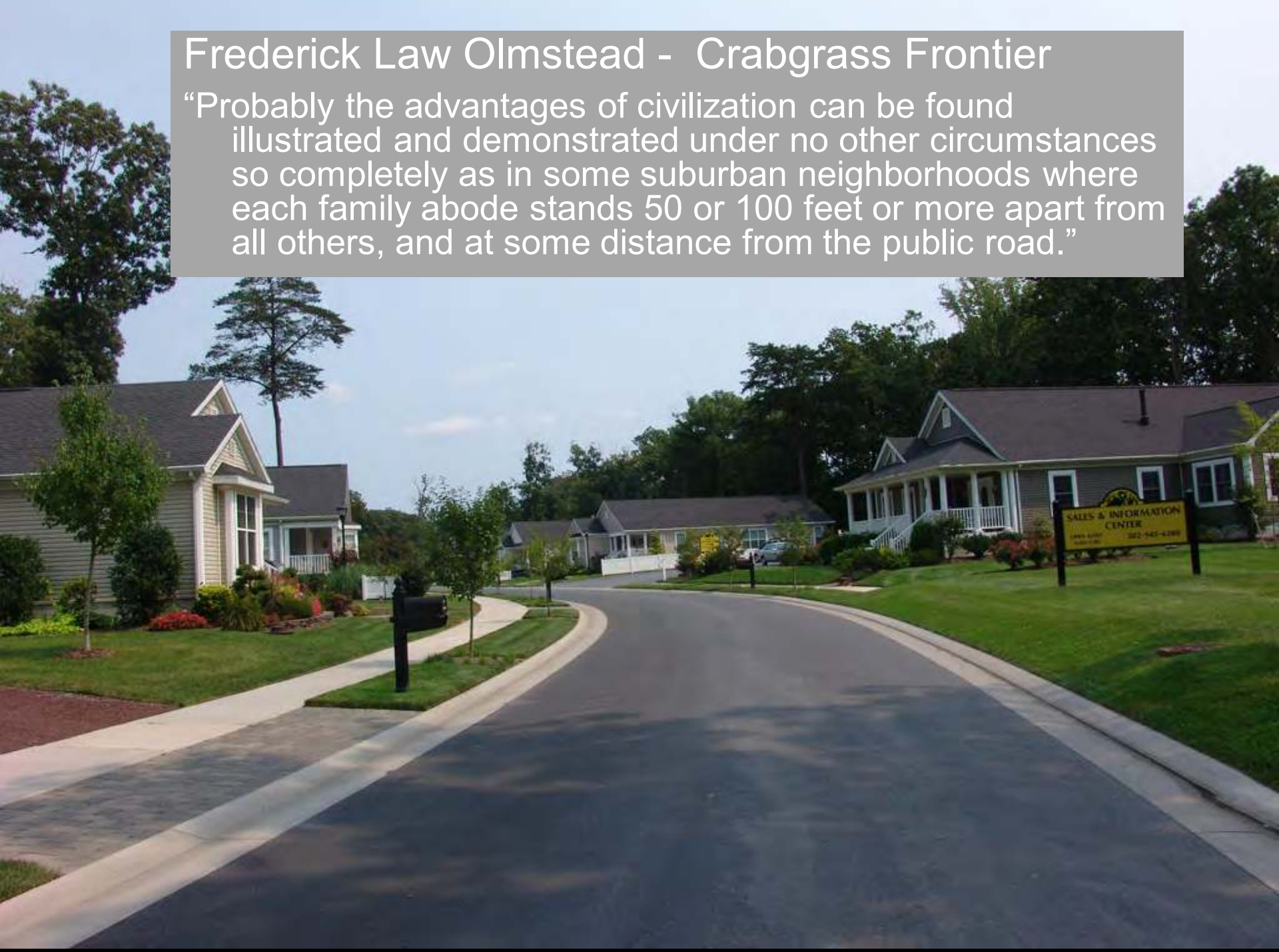
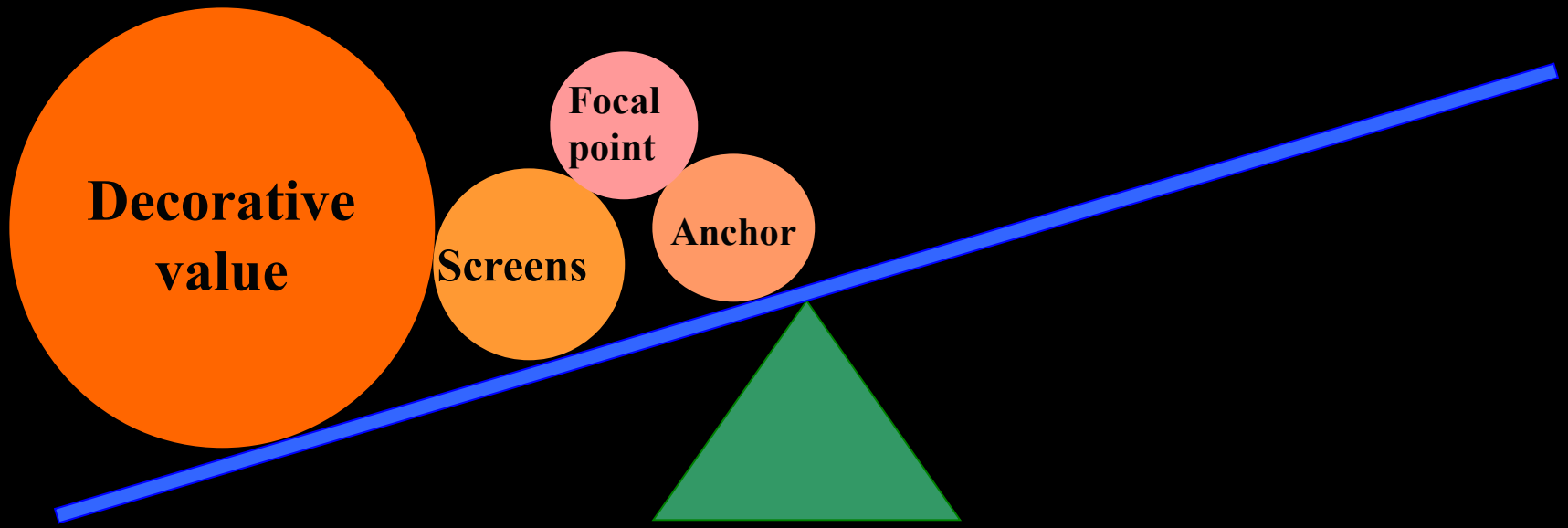
University of Delaware



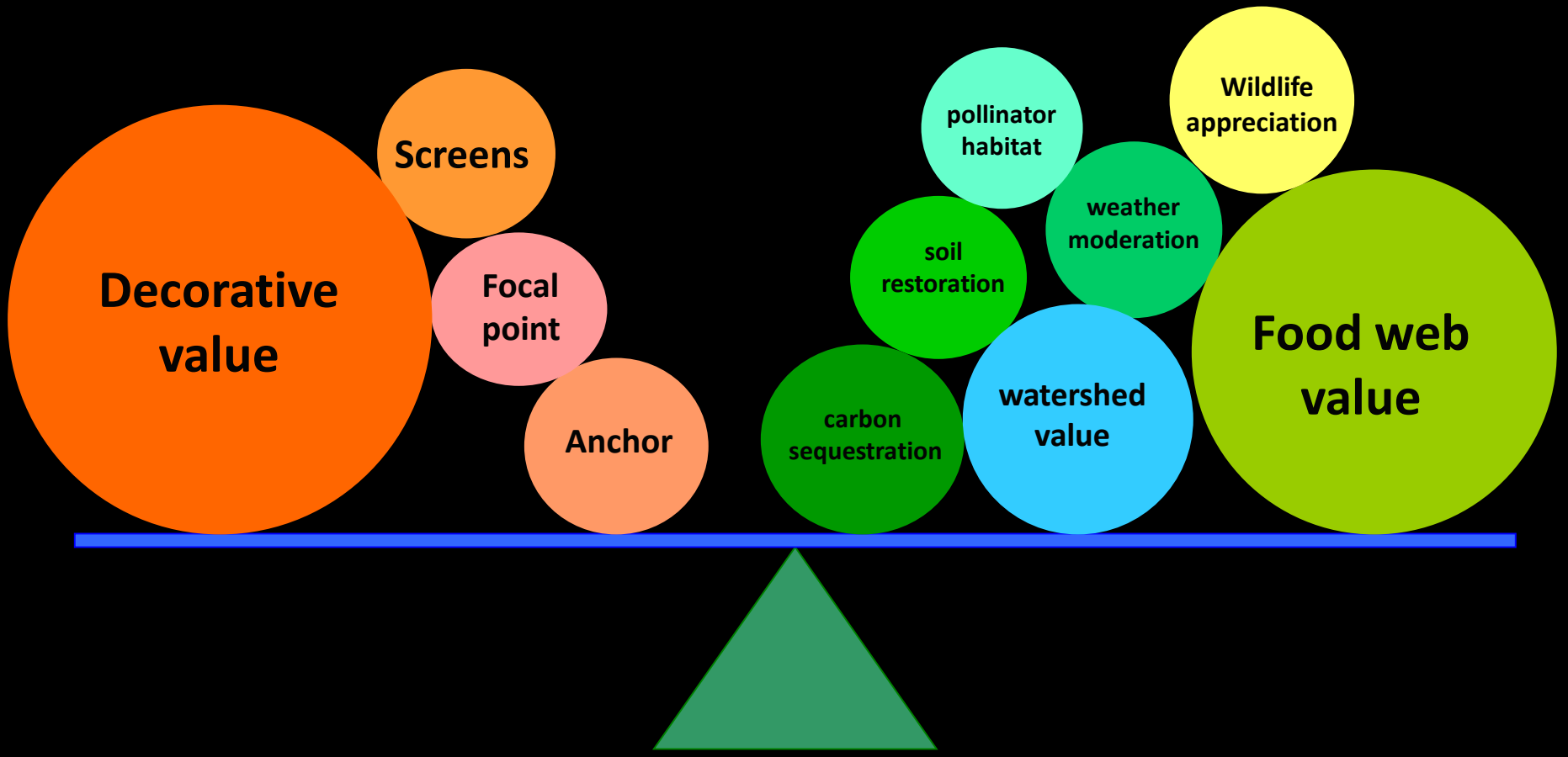

Frederick Law Olmstead - Crabgrass Frontier

"Probably the advantages of civilization can be found illustrated and demonstrated under no other circumstances so completely as in some suburban neighborhoods where each family abode stands 50 or 100 feet or more apart from all others, and at some distance from the public road."





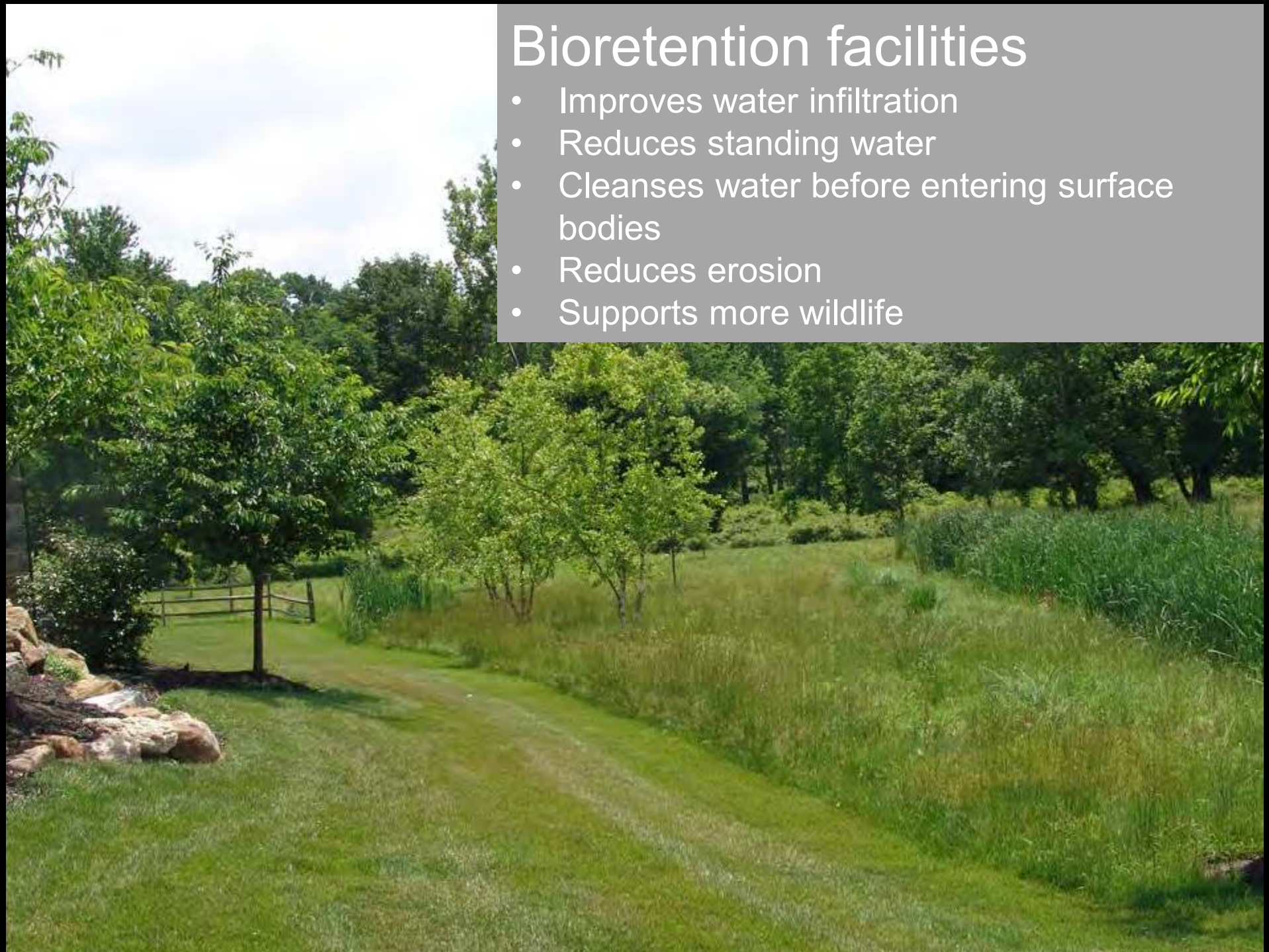
Past criteria for choosing plants for our landscapes



Future criteria for choosing plants for our landscapes

Meadows:

- Provides better water management
- Reduce nutrient pollution in water bodies
- Supports more wildlife
- Saves time and energy
- Looks attractive



Bioretention facilities

- Improves water infiltration
- Reduces standing water
- Cleanses water before entering surface bodies
- Reduces erosion
- Supports more wildlife

Forest/Woodland

- Improves air quality
- Plant layers reduce erosion
- Supports more wildlife


CROSSAN


Mixed meadow with Indiangrass backbone


Plug meadow – North Creek Nursery


Meadow establishment


Truax drill seeding


Hydroseeding


Broadcast in sawdust

Hydroseeding a meadow:

- Inaccessible terrain
- 2 – step process
  - Spread seed in water
  - Spread paper pulp on top

Drill seeding a meadow:

- Good seed soil contact
- Allows even distribution of different sized seed (Truax drill)

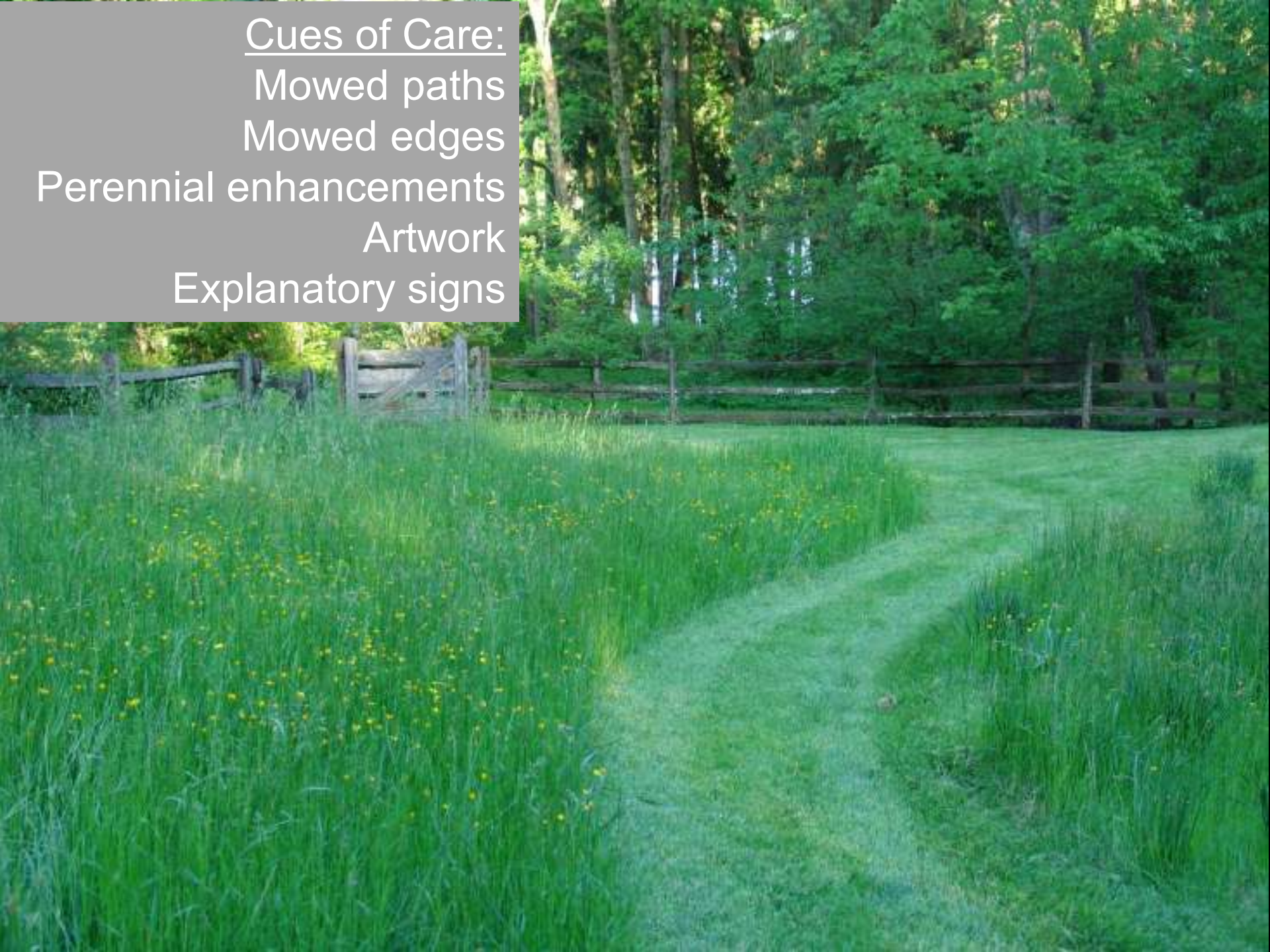
Broadcast in an organic medium:

- Keeps seed moist
- Excludes light from annual weeds
  - crabgrass
  - foxtail


KUBOTA

Meadow maintenance


NOTICE OF VIOLATION


Cues of Care:
Mowed paths
Mowed edges
Perennial enhancements
Artwork
Explanatory signs


CEO
Environmentally
Friendly
Grass

Rethinking Laird's Landscape

Meadows

Native Plants

Provide food and shelter for local wildlife

Reforestation

Rain Gardens

Reduce stormwater runoff and protect water quality

Reduced Mowing

Emit less carbon with less mowing

Discover a landscape that is attractive, eco-friendly, and ready to enjoy!

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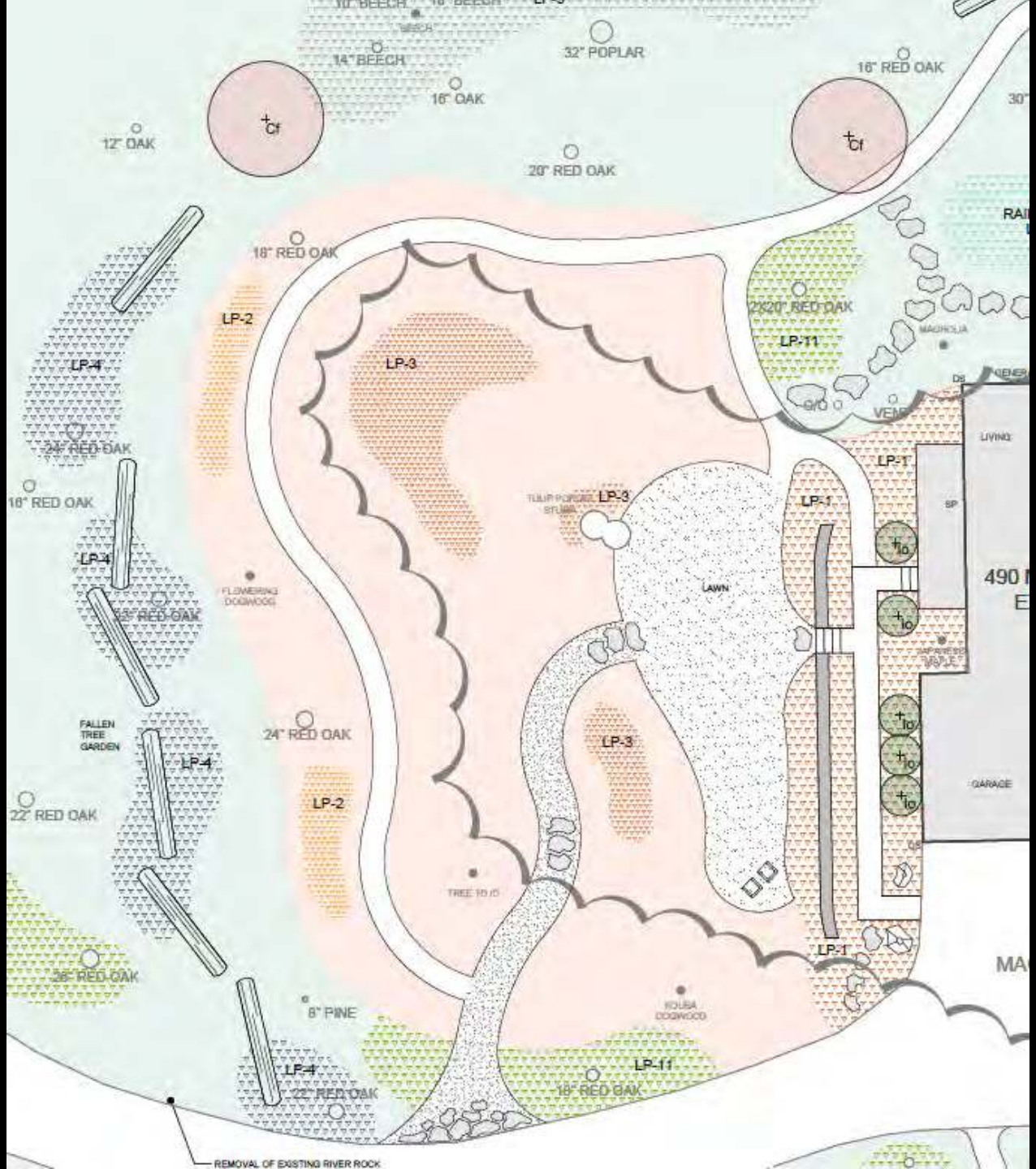
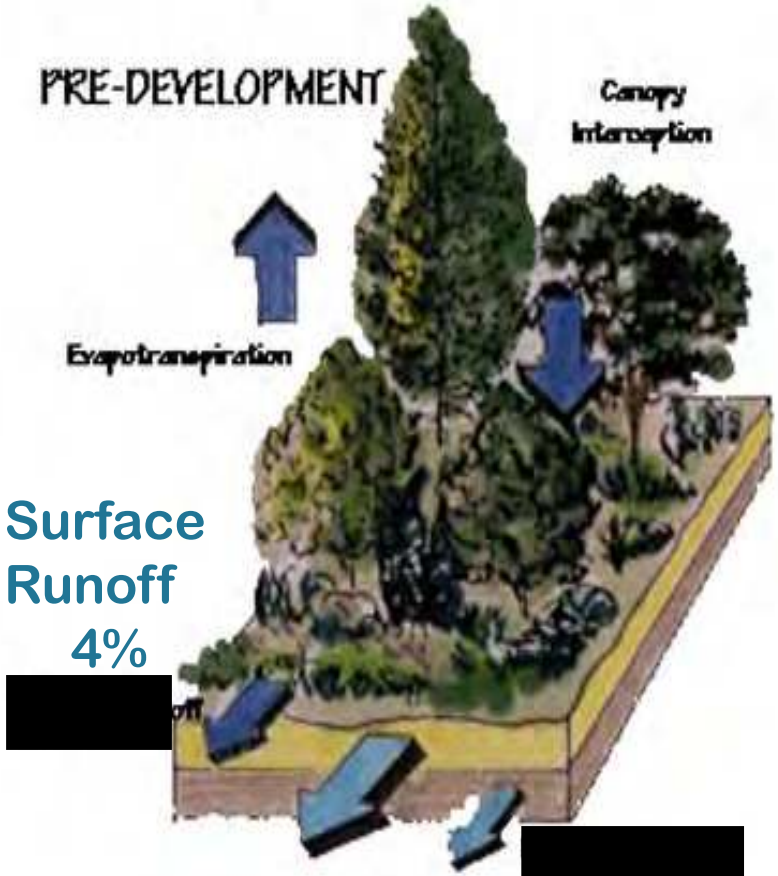
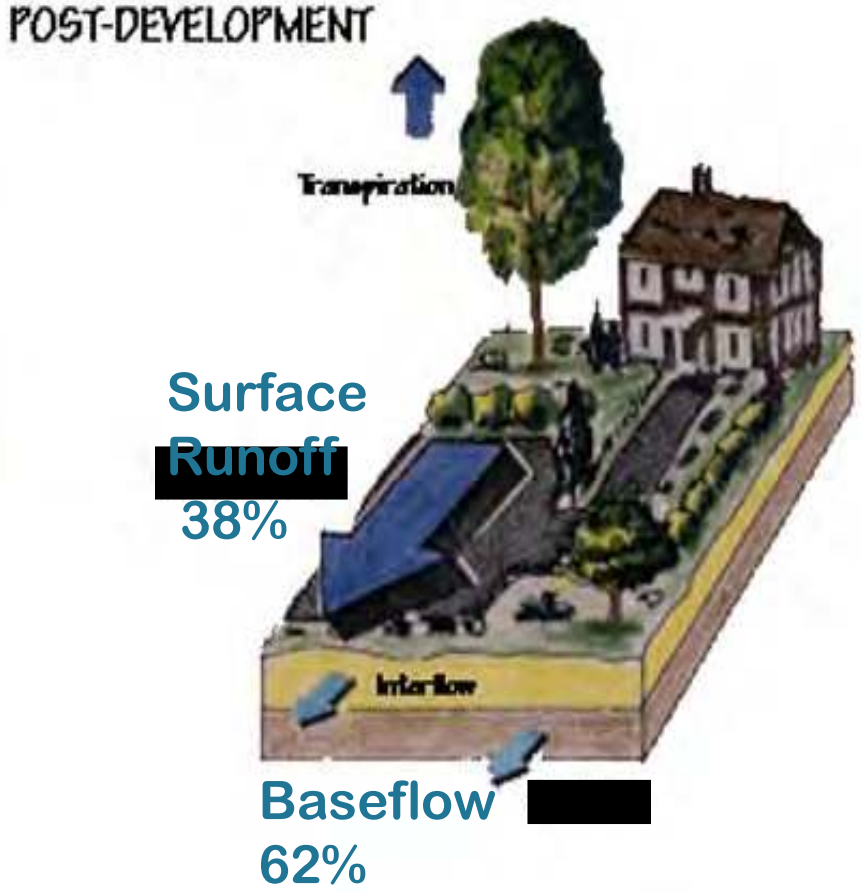

14" BEECH
32" POPLAR
16" RED OAK
16" OAK
12" OAK
20" RED OAK
18" RED OAK
LP-2
LP-3
LP-4
LP-11
24" RED OAK
16" RED OAK
LP-1
LP-3
LP-1
LP-4
22" RED OAK
FLOWERING DOGWOOD
LAWN
FALLEN TREE GARDEN
24" RED OAK
LP-4
LP-3
LP-2
22" RED OAK
LP-1
36" RED OAK
8" PINE
KOUSA DOGWOOD
LP-4
LP-11
22" RED OAK
18" RED OAK
LIVING
SP
GARAGE
REMOVAL OF EXISTING RIVER ROCK

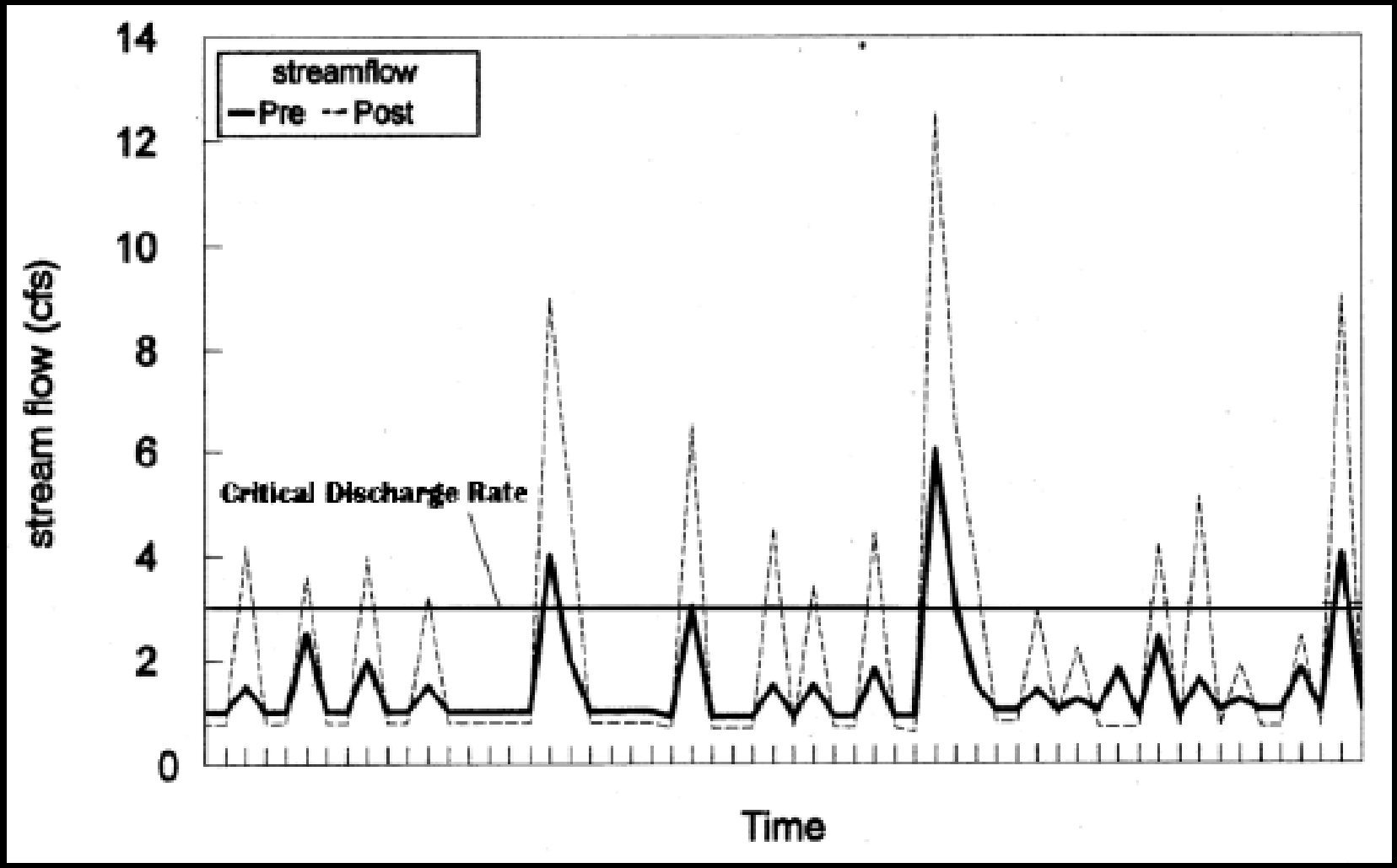

TORO

WATER BALANCE





Increased Frequency of Extreme Flows



(from Figure 1.4 of Chapter 1, MD SW Design Manual)

Stream Channel & Bank Erosion

Christina River at Rittenhouse Park

Culvert Outlet Near Christiana Towers

This shows the value of KEEPING trees, and plants living on our soil! As soon as we rip out all of the resources....we pollute our ground water...which becomes harder and harder to purify for us to then drink!!!

Change in paradigm

- From efficient collection
  to
- Percolation on site

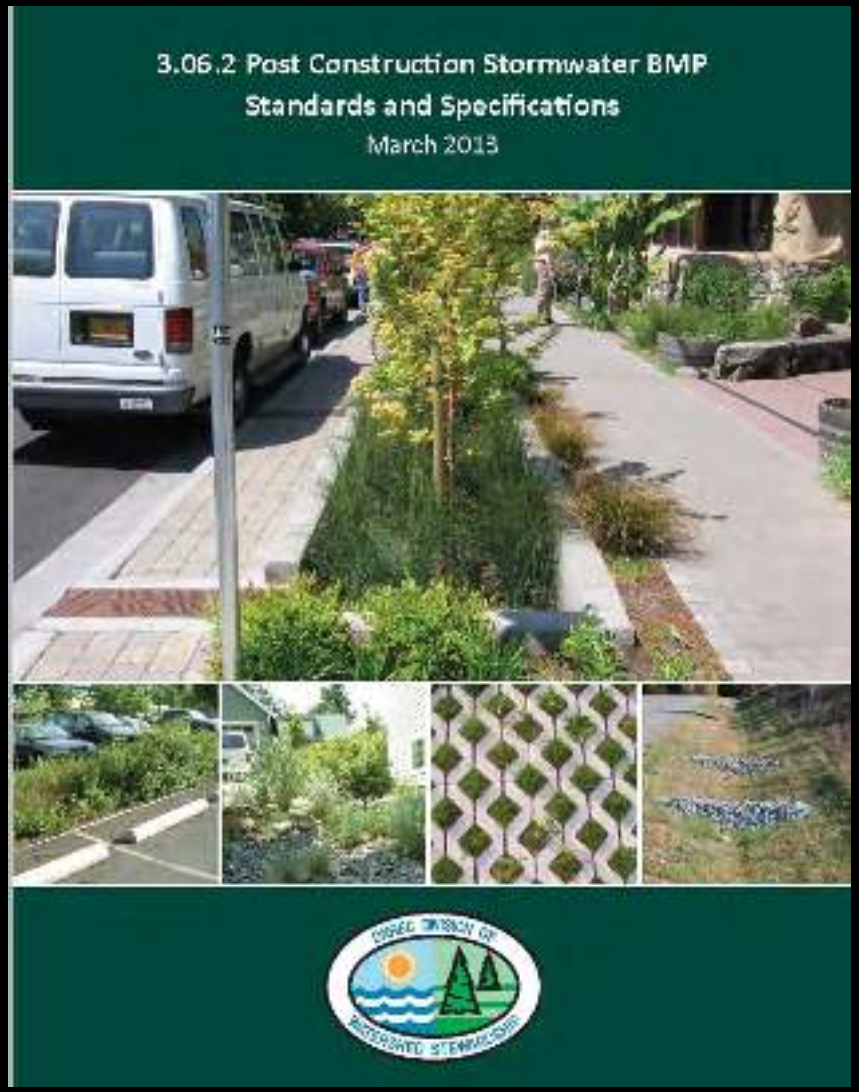
Early SWM Regulations

- Focus was on water ***quantity*** Issues
- detention ponds were emphasized.
- ponds address:
  - attenuation of peak flows
  - removal of TSS (especially wet ponds)

Problems with Ponds?

- Thermal pollution of cold-water streams.
- High flow for extended periods cause stream channel degradation.
- Overlapping high flows from multiple ponds on a watershed can increase peak flows downstream.
- Take up valuable land area!

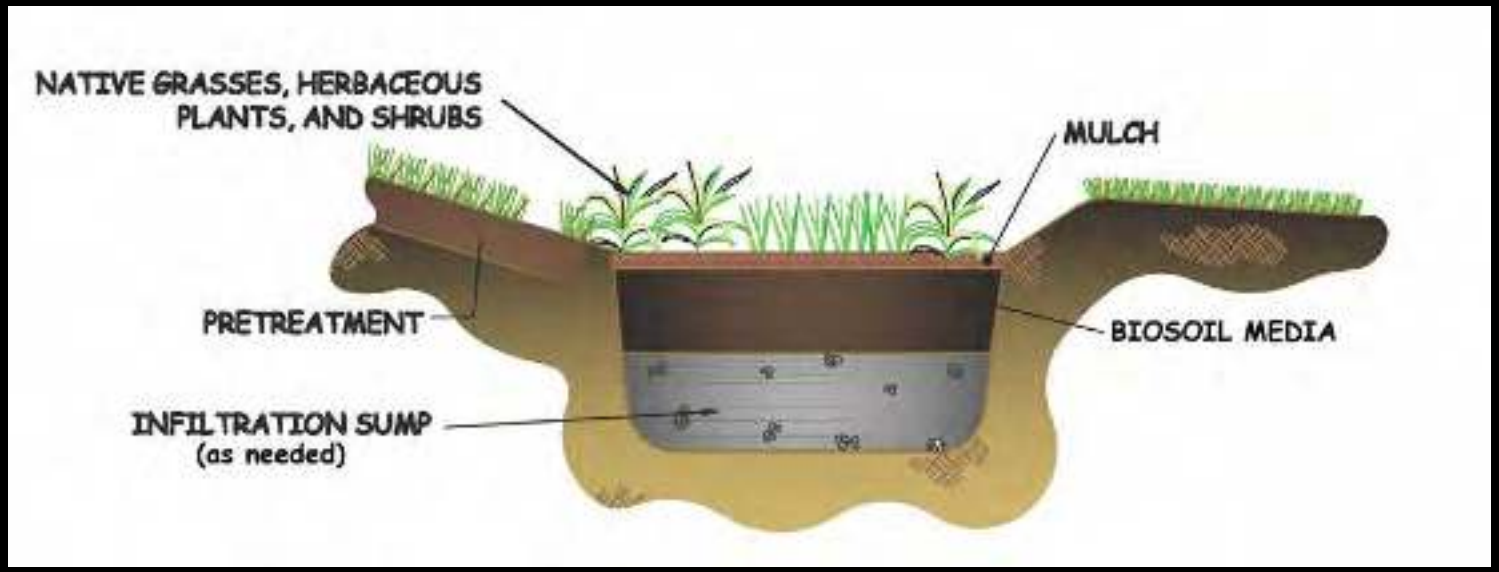
Recommended Reference for Stormwater BMPs

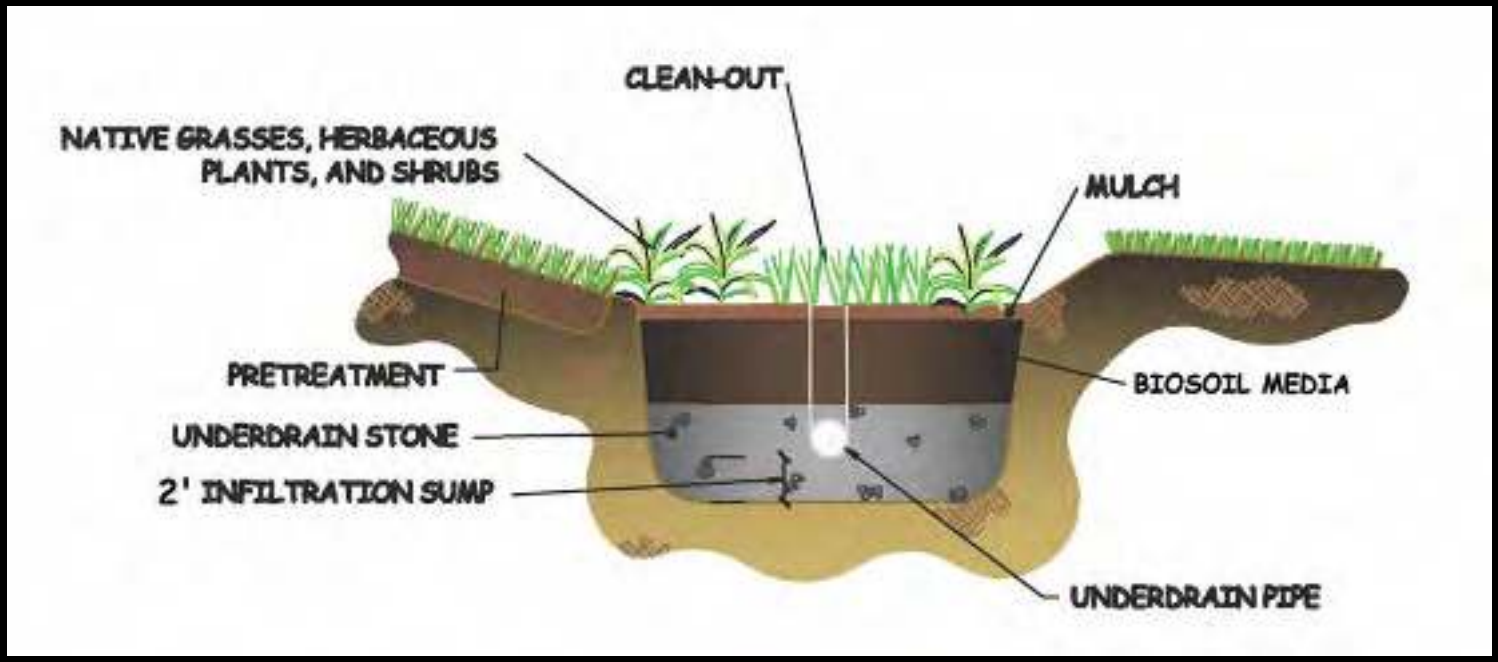


See the link under "Standards and Specifications" at the DNREC web site: http://www.dnrec.delaware.gov/swc/pages/SedimentStormwater.aspx


LIBRARY

Traditional Bioretention (2-A) – Infiltration or Underdrain





Bioswale

Grassed Channel

Without Check Dams

With Check Dams

Differences

- Rain Garden
  - Natural dosing of water into groundwater
  - Small/lg gardens on individual lots
- Detention Pond
  - Manufactured way to handle surges
  - Collect from entire development and hold

Rain Gardens

- Sunken garden with well-adapted plants
- 4-6 inches deep with flat bottom
- Normally 1/3 the size of area draining to it
- Formal or informal

Planting

- 75% native species
- Up to 25% exotic species (not aggressive or invasive)
- Groundcover of herbaceous plants
- 2-4 inches of shredded hardwood bark mulch

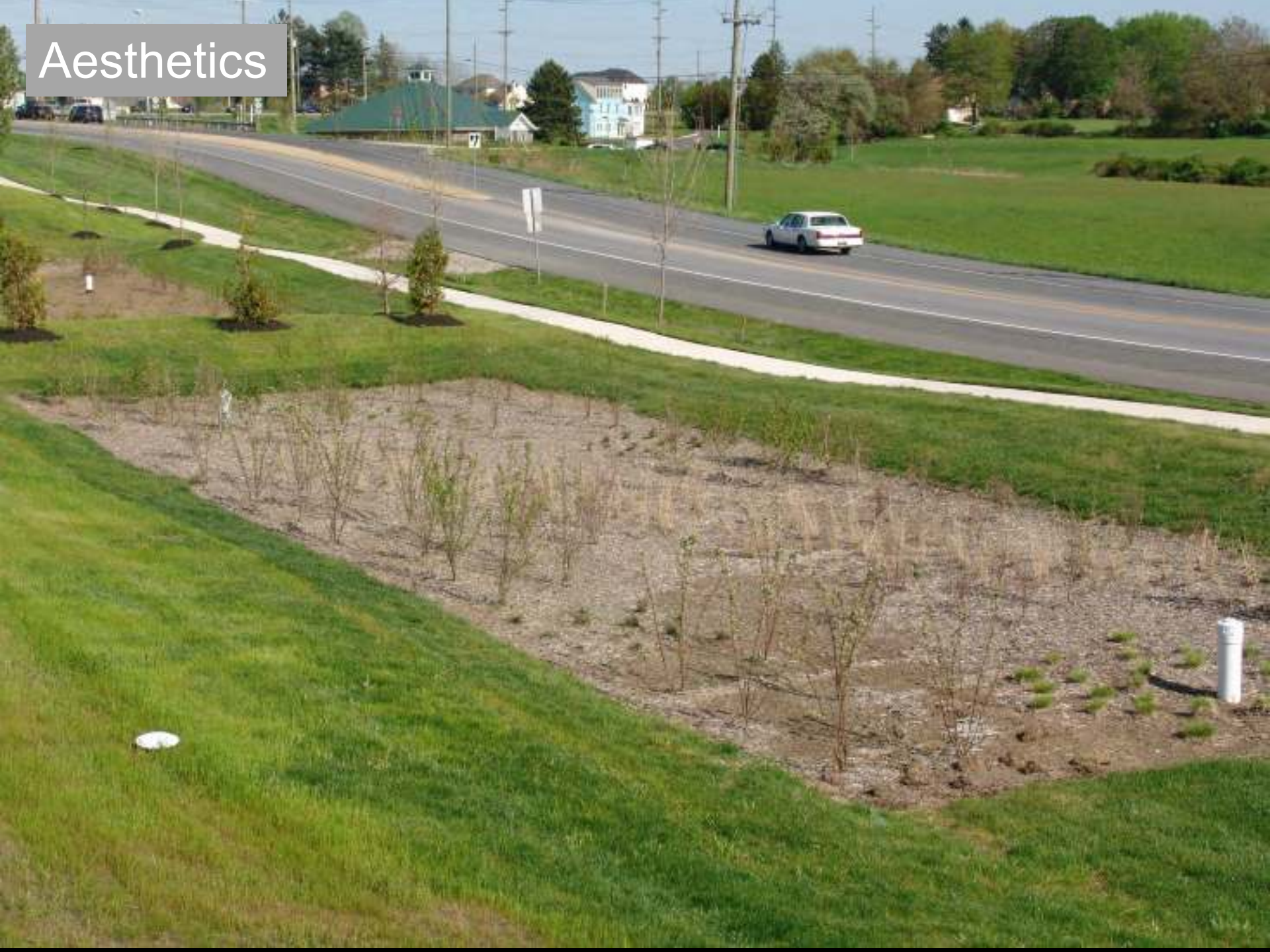
Planting

- Soil depth must be 4’ for trees
- If snow melt is expected – use salt tolerant species
- Select water tolerant/drought species
- Use various sizes and ages


Trees in center?


Early successional groundcover

Aesthetics




SEA COLONY

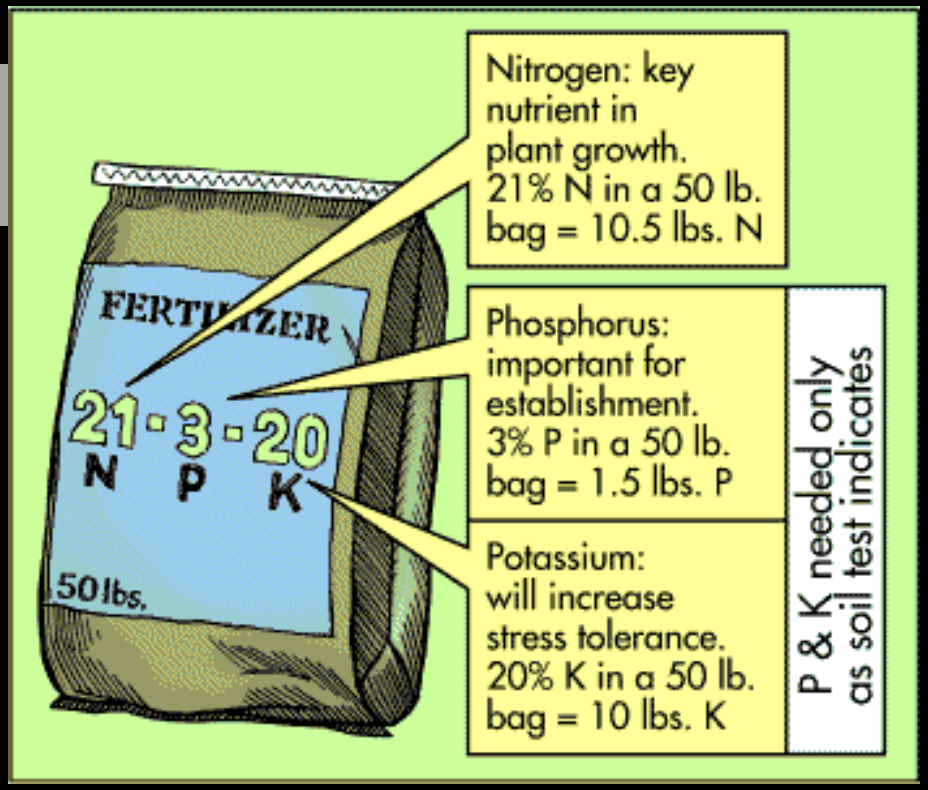

NO
STOPPING
STANDING OR
PARKING


Forest fragments


NEW HOLLAND
C175
Brushcat

Soil Fertility

- 16 essential nutrients
- C,H,O supplied by air
- N,P,K – primary nutrients
- Ca, Mg, S – secondary nutrients
- Micronutrients – in soil
- Nutrients absorbed by plant roos from soil solution



Nutrient Management

- Soil test before fertilizing
- Use slow release fertilizer
- Calibrate spreaders
- Use right kind of spreader and spreading technique
- Fertilize grass at appropriate times
  - Cool season in fall
  - Warm season in late spring

Nutrient Management (cont.)

- Sweep spilled fertilizer and reuse
- Do not fertilize within 25 feet of shoreline
- Clean up after pets
- Do not feed ducks and geese
- Keep storm gutter and drains clear of leaves
- Compost yard trimmings (to keep out of waterways)

UNIVERSITY OF DELAWARE SOIL TESTING PROGRAM IS OPEN

New Address:
UD Soil Testing Laboratory
PO Box 9089
Newark, DE 19714

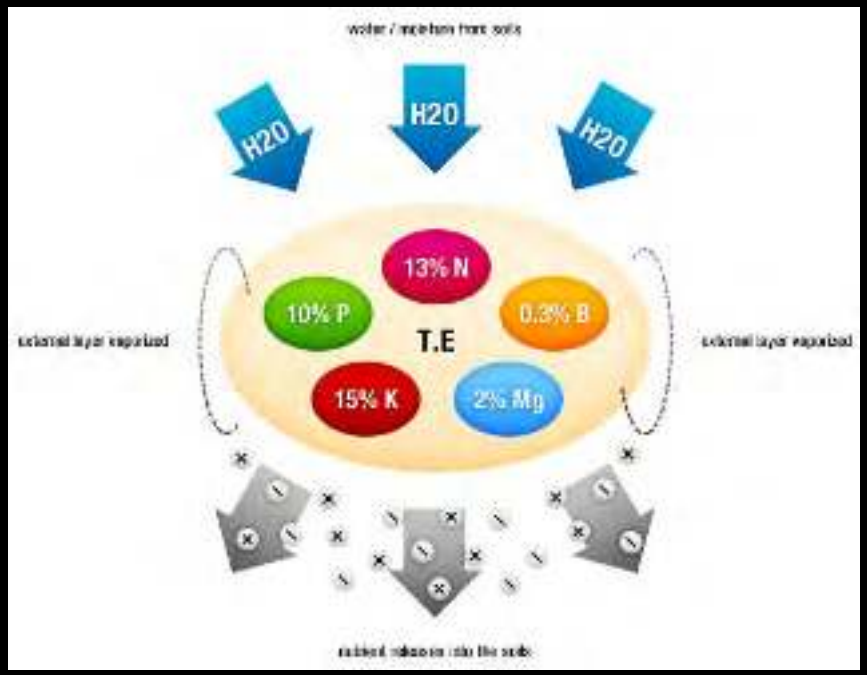
How to Submit Samples Without Regular Soil Test Bags

1. Collect a representative sample and thoroughly mix.
2. Place 1-1.5 cups of the mixed sample into a ziplock bag.
3. Label the bag with your name and the sample ID (e.g., Field 6, Backyard, etc)
4. Write down the appropriate information sheet from the Soil Testing Program Forms"
5. Complete one copy of the information sheet for each sample. Be sure that the sample ID on the bag and the sample ID on the information sheet match.
6. Enclose payment (check payable to University of Delaware or for credit card, include your daytime phone number and someone from the office with contact you for credit card information over the phone.
7. Place samples, information sheet and payment (if paying by check) in a box or large mailing envelope and send.

Additional Questions Please call the office at 302-831-1392 or email Soiltest@udel.edu

Fertilizer Solubility

- Quick Release
  - immediately available
  - use for quick response
  - inexpensive



- Slow Release
  - release over time
  - different release mechanisms
  - use for long term maintenance
  - won't burn
  - less likely to leach

Fertilization timing

WINTER

uses stored
winter food

must store food for
root & tiller production

SPRING

FALL

vigorous top
growth

out of dormancy
with fall rains ★

turf dormant

SUMMER