

Simplifying Designer Ditches

Presented October 11, 2023

Nanticoke Watershed Alliance

John Sandkuhler, Restoration Coordinator

johnsandkuhler@nanticokeriver.org

410.622.3669



Nanticoke Watershed Alliance

Mission:

Fostering partnerships and progress in conserving the natural, cultural, and recreational resources of the Nanticoke River watershed through dialogue, collaborative outreach, and education.



Plain ol' Ditches

Traditional Functions:

- Manage mosquitoes
- Reduce flooding and property damage
- Prevent crop loss from too much rain



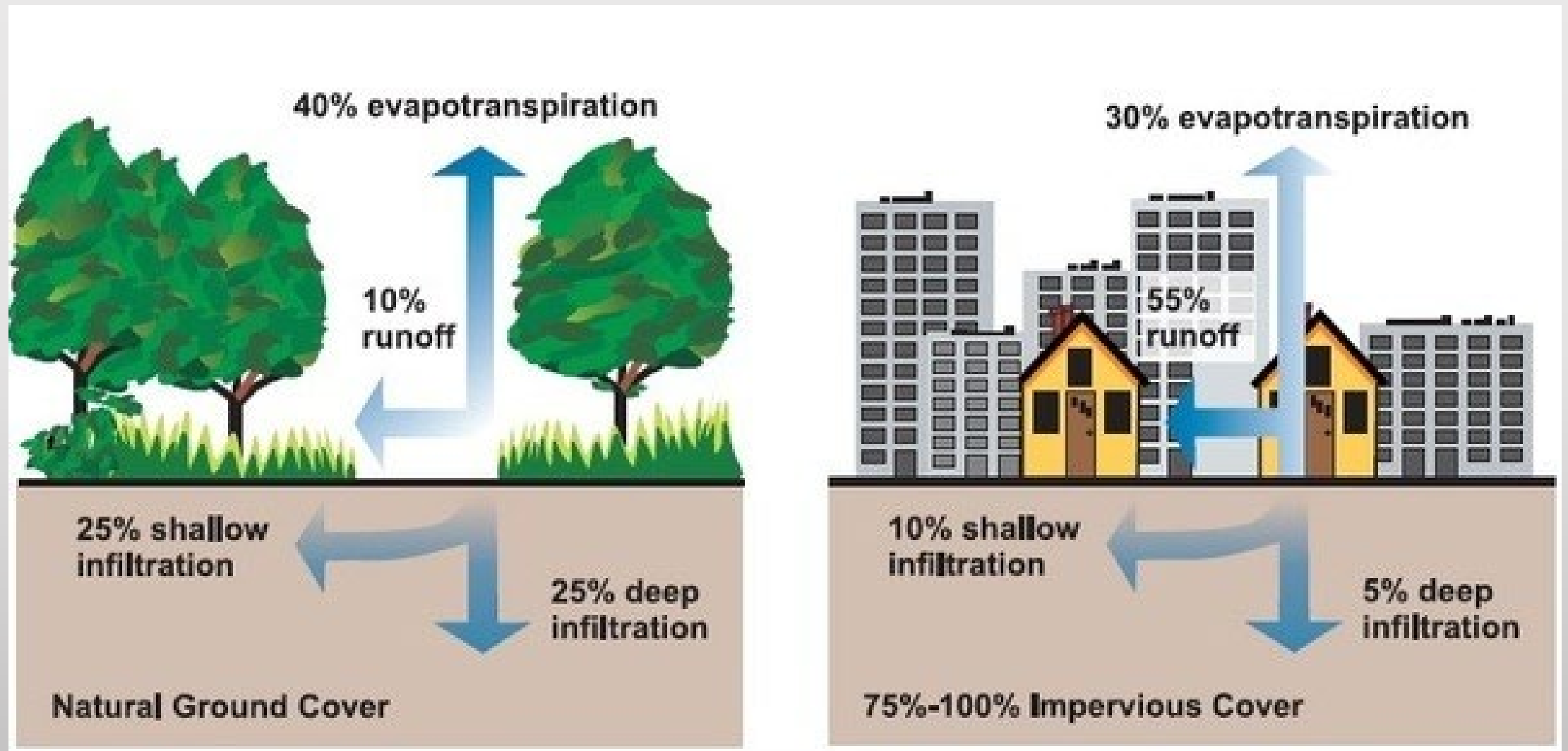
Designer Ditches

Additional Functions:

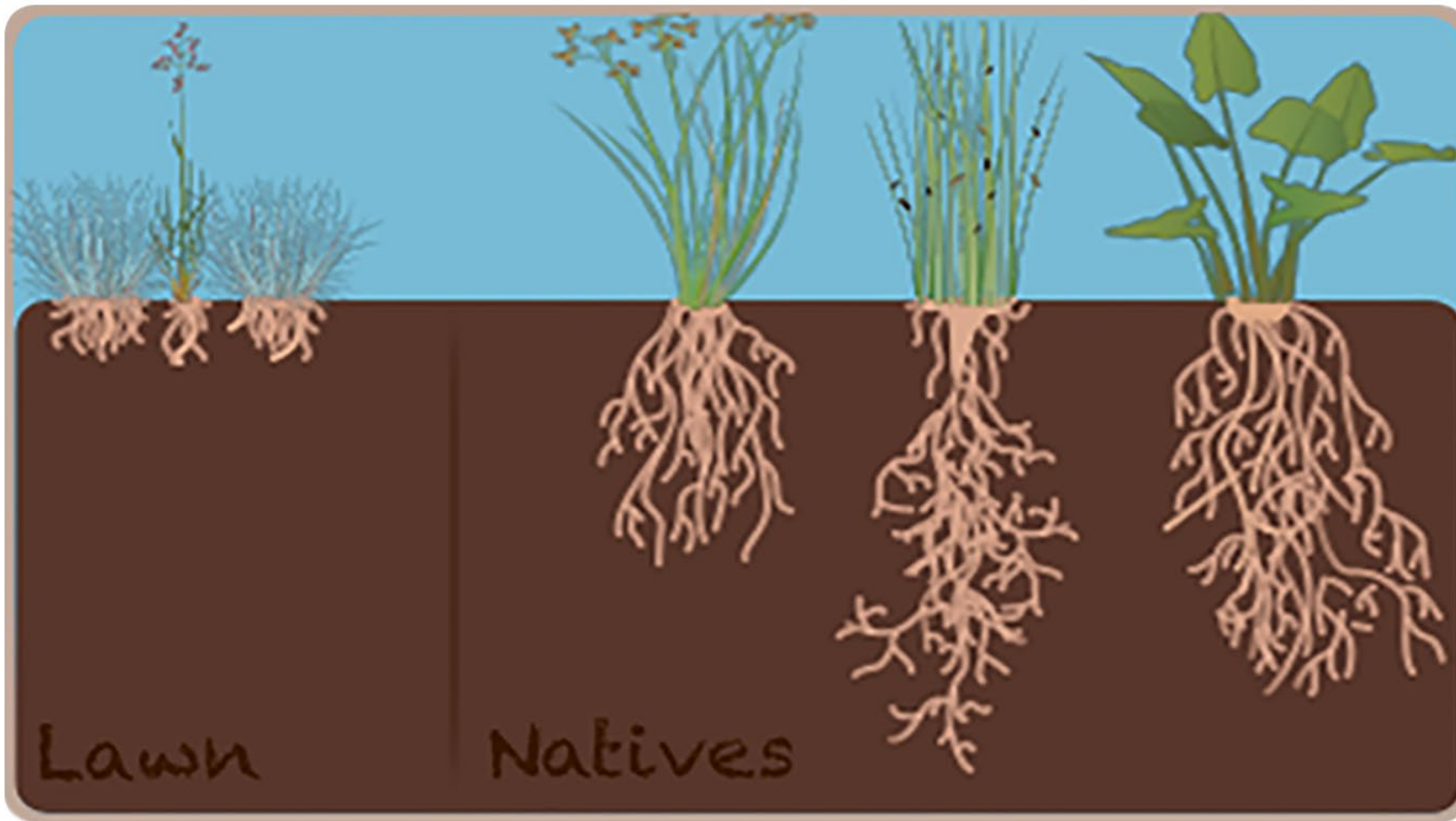
- Enhances landscape aesthetics
- Provide food/habitat for pollinators, butterflies, birds, & other wildlife
- Uptake excess nutrients, mitigate pollution
- Increase the reduction of flood volume & erosion
- Protect oysters, bay grasses, and fish from sedimentation (smothering)
- Replenish ground water
- Increase biodiversity
- Improve water quality of our tributaries and bays
- *Less expensive and less labor-intensive in the long-term*



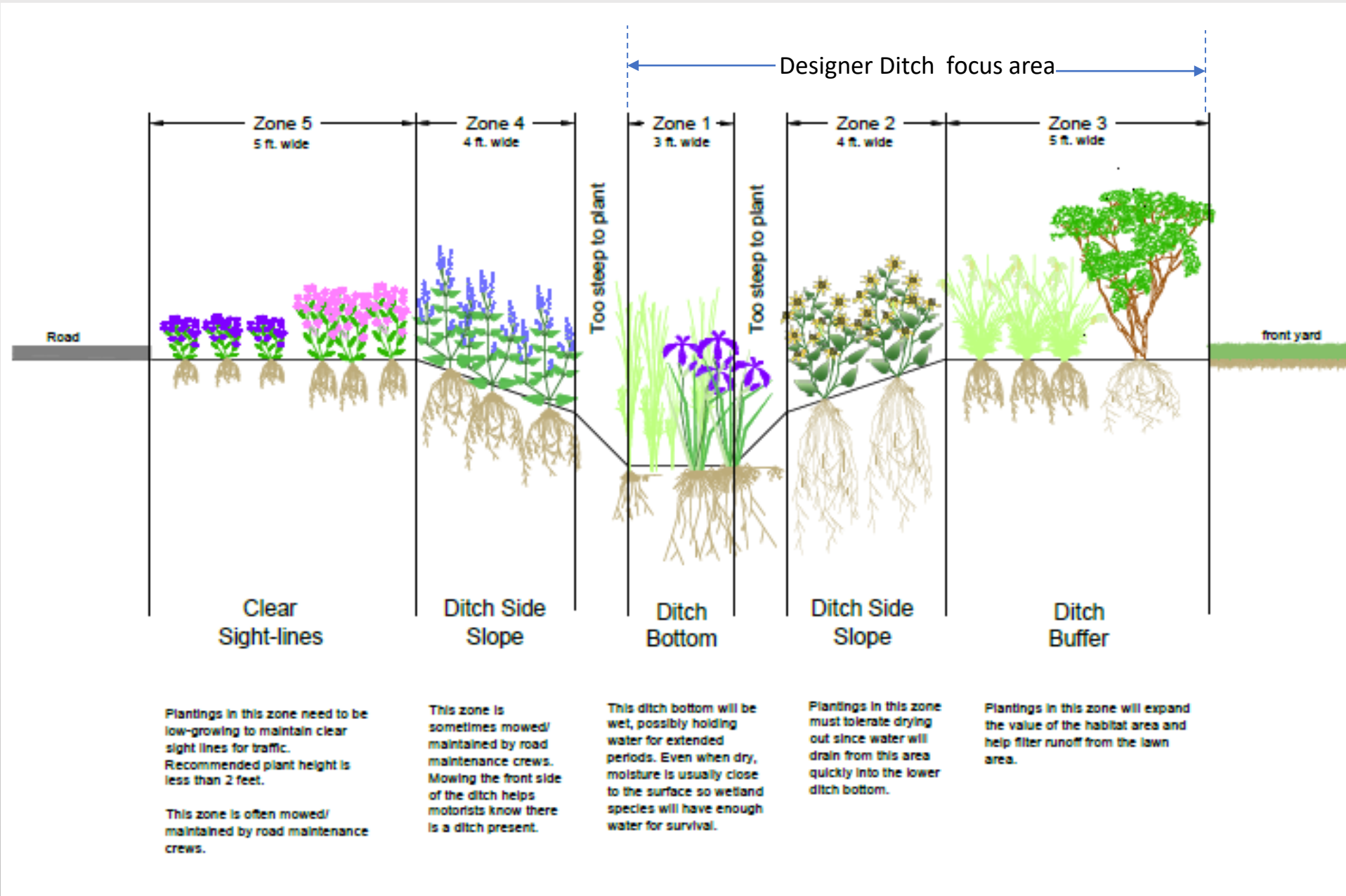
Pervious vs. Impervious



Water/Nutrient Uptake, Soil Stabilization, & Soil Structure (Quality)



Ditch cross-section view



Many Considerations:

Ownership

- Who owns and/or maintains the ditch or is there an easement?
- Is this part of a tax ditch or a transportation right-of-way?
- Do you need homeowner association or any other approvals before planting?

Water

- Is there a lot of stormwater flowing through the ditch? What is the volume and speed?
- Is there ever standing water, and if so, how much, when, and for how long?
- Are there currently erosion problems?
- Is there anything blocking the flow of water?

Logistics

- Are there utilities to avoid?
- When was the last time the ditch was dug out? Will that be happening soon?

Many considerations (continued)...

Goal

- Why are you considering a designer ditch? (erosion, beautification, etc.)

Design

- What is the size/shape/depth of the area you want to plant and maintain?
- How far above the top of the ditch would you like to create a buffer?
- Do the plants need to be below a certain height to allow cars to see traffic when backing out?

Cultural

- How much sunlight does the area get?
- Is there a lot of road salt?
- What type of soil is it?

Maintenance

- *Will you regularly maintain the ditch, especially for the first two years?*

So, how is this SIMPLIFIED?

Original Plant List

Plant Selection

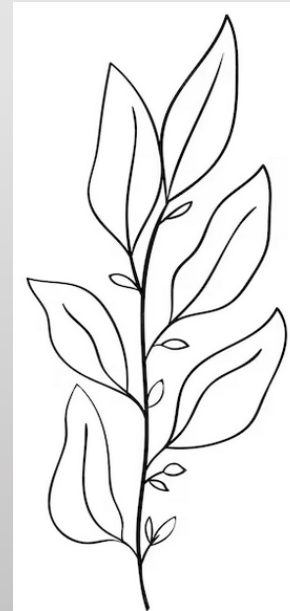
ID	Botanical Name	Common Name	Pollinators/ Butterflies	Birds	Shrubs	Grasses	Sun	Shade	Comments
Zone 1									
Ai	<i>Asclepias incarnata</i>	swamp milkweed	X				X		Summer blooming-Monarch caterpillar host plant
Cc	<i>Carex crinita</i>	fringed sedge				X	X	X	grass-like, low growing
Cs	<i>Carex stricta</i>	tussock sedge				X	X	X	grass-like, medium height
Cg	<i>Cheilone glabra</i>	Turtlehead	X				X	X	Summer blooming-host to
Ed	<i>Eupatorium dubium</i>	Joe-Pye weed	X				X	X	summer blooming, pollinator friendly, very tall plant
Ha	<i>Helianthus angustifolius</i>	swamp sunflower	X	X			X		fall blooming, late season nectar source, very tall
Hm	<i>Hibiscus moscheutos</i>	marsh hibiscus	X	X			X		summer blooming, attractive to hummingbirds, tall plant
Iv	<i>Iris versicolor</i>	blue flag iris					X	X	spring blooming
Je	<i>Juncus effusus</i>	soft rush				X	X	X	grass-like, medium height
Lc	<i>Lobelia cardinalis</i>	cardinal flower		X			X	X	summer blooming, attractive to hummingbirds
Os	<i>Onoclea sensibilis</i>	sensitive fern						X	likes moist shade
Or	<i>Osmunda regalis</i>	royal fern						X	likes moist shade
Vn	<i>Vernonia noveboracehsis</i>	New York Ironweed	X				X		summer blooming, pollinator friendly, very tall plant
Zone 2 - 3 - 4									
At	<i>Asclepias tuberosa</i>	butterfly milkweed	X				X		Summer blooming-Monarch caterpillar host plant
Ad	<i>Aster divericatus</i>	white wood aster	X					X	fall blooming, late season nectar source
An	<i>Aster novae-angliae</i>	New England aster	X				X		fall blooming, late season nectar source
Ch	<i>Chasmanthium latifolium</i>	northern sea oats				X	X	X	partial shade to shade
Ep	<i>Echinacea purpurea</i>	purple coneflower	X	X			X		Long bloom season, attractive to pollinators. Seeds attractive to gold finches.
Ec	<i>Eupatorium coelestinum</i>	mistflower	X				X	X	fall blooming, late season nectar source
Ls	<i>Liatris spicata</i>	blazing star	X				X		summer blooming, pollinator friendly
Mf	<i>Monarda fistulosa</i>	wild bergamot	X				X	X	summer blooming, pollinator friendly
Pv	<i>Panicum virgatum</i>	switchgrass				X	X		tall, warm-season grass
Pd	<i>Penstemon digitalis</i>	beardtongue					X	X	spring blooming, pollinator friendly
Pm	<i>Pycnanthemum muticum</i>	mountain mint	X				X		summer blooming, pollinator friendly
Rf	<i>Rudbeckia fulgida</i>	black-eyed Susan	X	X			X		summer blooming, pollinator friendly
Sc	<i>Schizachyrium scoparium</i>	little bluestem				X	X		2-3 ft, warm-season grass
Ss	<i>Solidago sempervirens</i>	seaside goldenrod	X				X		fall blooming, late season nectar source
Shrubs									
AA	<i>Aronia arbutifolia</i>	red chokeberry	X	X	X		X	X	spring blooming with berries for birds in fall
CA	<i>Clethra alnifolia</i>	sweet pepperbush	X		X		X	X	summer blooming, pollinator friendly
IG	<i>Ilex glabra</i>	inkberry		X	X		X	X	evergreen, fruit for birds
IV	<i>Itea virginica</i>	Virginia sweetspire	X		X		X	X	summer blooming, pollinator friendly
VD	<i>Viburnum dentatum</i>	arrowwood		X	X		X	X	spring blooming with berries for birds in fall
Zone 5									
Ac	<i>Allium cernuum</i>	nodding onion	X				X		spring blooming, pollinator friendly
Am	<i>Amsonia tabernaemontana</i>	amsonia blue ice	X				X	X	spring blooming, pollinator friendly
Cl	<i>Coreopsis lanceolata</i>	lance leaf coreopsis	X				X	X	summer blooming, pollinator friendly
Es	<i>Eragrostis spectabilis</i>	purple love grass				X	X		ornamental grass less than 2 ft tall
Gm	<i>Geranium maculatum</i>	wild geranium	X					X	spring blooming, pollinator friendly
Of	<i>Oenothera fruticosa</i>	sundrops	X				X		summer blooming, pollinator friendly
Ps	<i>Phlox subulata</i>	mass phlox	X				X		spring blooming, pollinator friendly
Ph	<i>Phlox stolonifera</i>	creeping phlox	X					X	spring blooming, pollinator friendly
Sa	<i>Senecio aureus</i>	golden ragwort	X				X	X	spring blooming, pollinator friendly
Sc	<i>Silene caroliniana</i>	wild pink	X				X	X	spring blooming, pollinator friendly
Sh	<i>Sporobolus heterolepis</i>	prairie dropseed				X	X		ornamental grass less than 2 ft tall



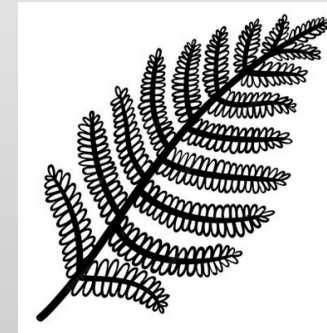
Simplifying how?

- Acquisition of native species: fewer species to find, but more readily available at nurseries

- Maintenance: easier to ID wanted vs. unwanted plants (weeds)



herbaceous



fern

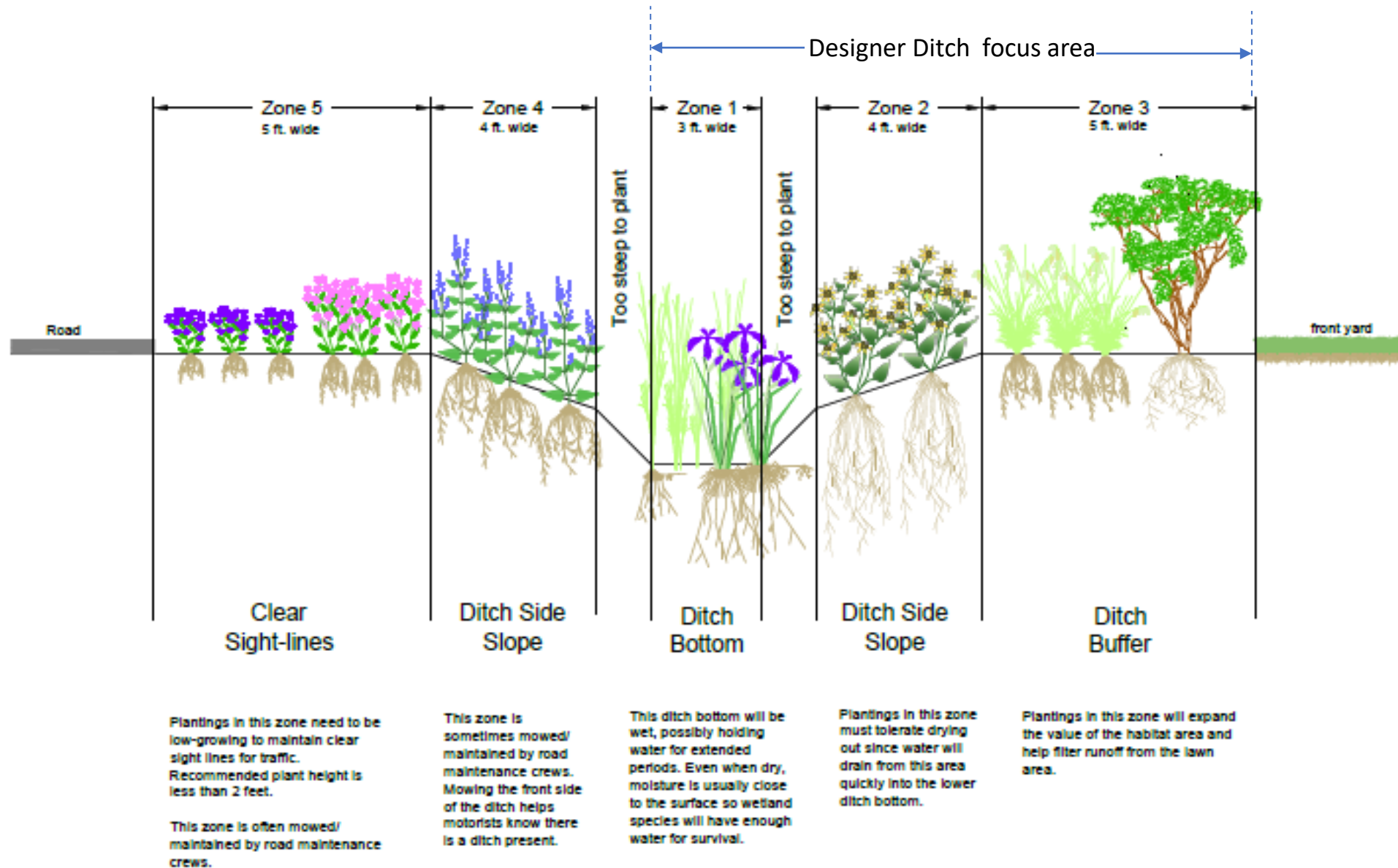


grass (-like)

ZONE 1	Plant Type	Botanical Name	Common Name	Full Sun	Part Shade / Part Sun	Full Shade	Comments	
Pick 2 species, each 1 from a different Plant Type	grass, grass-like	<i>Agrostis perennans</i>	Autumn bentgrass	X	X	X	DMW, CL, 1-3'	
		<i>Carex crinita</i>	fringed/long hair sedge	X	X		MW, CL, usually low growing, 1-5'	
		<i>Carex stricta</i>	tussock sedge	X			MW, CLS, 1-3.5'	
		<i>Juncus effusus</i>	soft rush	X	X		MW, CLS, flood to 12" depth, 1-4'	
	fern	<i>Onoclea sensibilis</i>	sensitive fern	X	X	X	MW, CLS, 1-3.5'	
		<i>Osmunda regalis</i>	royal fern		X	X	MW, CLS, tolerates flooding for only a few days, likes moist shade, 1.5-6'	
		<i>Pteridium aquilinum</i>	bracken fern	X	X		DMW, CLS, 1.5-6'	
	herbaceous	<i>Asclepias incarnata</i>	swamp milkweed	X	X		MW, CL, prefers full sun, drought tolerant, 4-6'	
		<i>Hibiscus moscheutos</i>	marsh hibiscus	X	X		MW, CL, moderately brackish tolerant, flood to 6" depth, 3-6'	
		<i>Iris versicolor</i>	blue flag iris	X	X		MW, LS, slightly brackish tolerant, flood to 6" depth, 3'	
		<i>Eutrochium dubium</i>	Joe-Pye weed	X	X		MW, S, 2-5'	
	KEY: Full Sun (>6 hrs. direct sun) Part Shade / Part Sun (2-6 hrs. direct sun) Full Shade (<2 hrs. direct sun) D=Dry M=Moist W=Wet C=Clay L=Loam S=Sand O=organic							



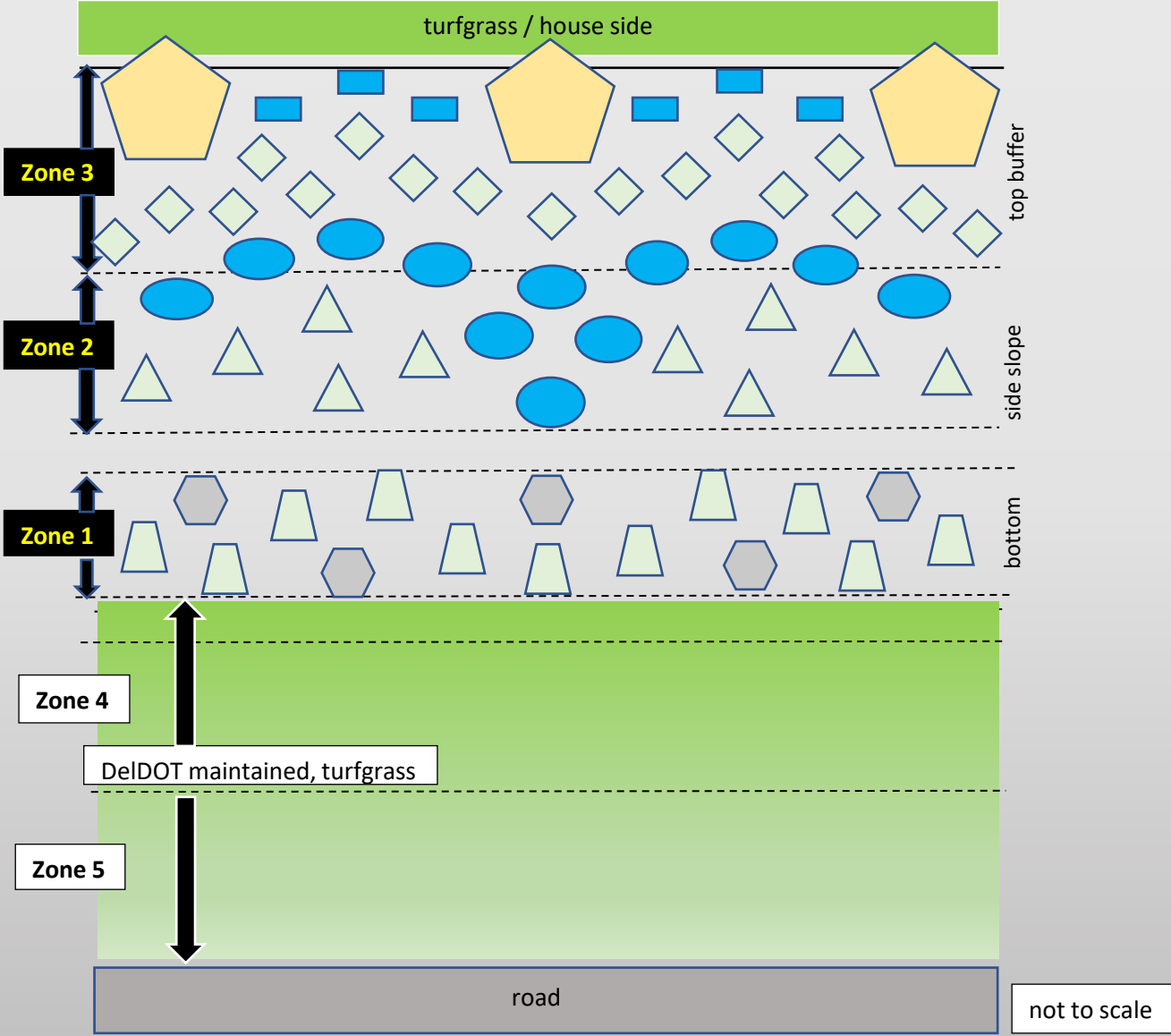
Ditch cross-section view










ZONE 2, 3	Plant Type	Botanical Name	Common Name	Full Sun	Part Shade / Part Sun	Full Shade	Comments
Pick 2 species for each Zone, each 1 from a different Plant Type	grass, grass-like	<i>Chasmanthium latifolium</i>	northern sea oats	X	X		DM, CLS, prefers part shade, 2-5'
		<i>Panicum virgatum</i>	switchgrass	X	X		DMW, CLS, fresh & brackish tidal/nontidal, 3-6'
		<i>Schizachyrium scoparium</i>	little bluestem	X			D, LS, heat tolerant, 1.5-3'
	herbaceous	<i>Conoclinium coelestinum</i>	mistflower		X	X	DMW, CL, can form dense stands, 1-3'
		<i>Penstemon digitalis</i>	beardtongue	X	X		DM, CLS, tolerates poor drainage, 2-4'
		<i>Rudbeckia fulgida</i>	orange coneflower	X	X		DM, L, 1.5-3.5'
		<i>Solidago sempervirens</i>	seaside goldenrod	X	X		DMW, LS, some road salt tolerance, 1-6'
Pick 1 for Zone 3 only	shrub	<i>Ceanothus americanus</i>	New Jersey tea	X	X		D, CLS, tolerates dryness & well-drained moist soil, 3'
		<i>Clethra alnifolia</i>	sweet pepperbush		X	X	MW, CLS, tolerates some brackish flooding, 6-12'
		<i>Ilex glabra</i>	inkberry	X	X	X	DM, CLSO, evergreen, tolerates some brackish flooding, 6-10'
		<i>Itea virginica</i>	Virginia sweetspire	X	X	X	MW, CLS, tolerates flooding to 6", 6-10'
KEY: Full Sun (>6 hrs. direct sun) Part Shade / Part Sun (2-6 hrs. direct sun) Full Shade (<2 hrs. direct sun) D=Dry M=Moist W=Wet C=Clay L=Loam S=Sand O=organic							



Site Plan example – DeIDOT maintained



	ID symbol	botanical name	common name
Zone 1 bottom		<i>Onoclea sensibilis</i>	sensitive fern
		<i>Iris versicolor</i>	blue flag iris
Zone 2 side slope		<i>Panicum virgatum</i>	switchgrass
		<i>Penstemon digitalis</i>	Beardtongue
Zone 3 top buffer		<i>Chasmanthium latifolium</i>	northern sea oats
		<i>Conoclinium coelestinum</i>	mistflower
		<i>Ilex glabra</i>	inkberry



Site prep:

- Apply aquatic-safe herbicide 2+ weeks in advance— *follow all label directions (not when windy, wear appropriate safety gear, etc.)*; >1 application might be needed
- Leave dead turfgrass in place

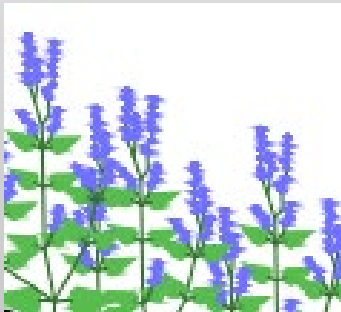


Installation:

1. Lay plants out in Zones 2 (all plugs) & 3 (plugs & shrubs), then plant
2. Lay plants (all plugs) out in Zone 1, then plant
3. Water thoroughly
4. Mulch top buffer Zone 3 only

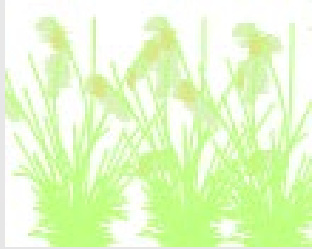
Maintenance:

- Water your ditch regularly for the first two years, especially during hot and dry weather
- Remove weeds as they emerge--do not allow weeds to go to seed!
- Remove trash/debris from ditch regularly and perform an autumn clean-up (make sure you spread seed heads or use elsewhere on your property before removing)
- Keep mulch in the top buffer zone



Assessment:

- Are any plants dead? Are any plants spreading, or do you need to plant more plugs?
- Are any species struggling?
- Are any areas eroding?



Designer Ditch: key points

- Planting bottom, only one side slope, & top buffer (closest to house) in most cases, Zones 1-2-3
- Highly variable: water-holding capacity (soil type), sizes and shapes, water conveyance, sunlight, etc.
- Maintenance can be labor intensive—weeding, fall clean-up a must—particularly first 2 years
- Mulch top buffer (Zone 3) only

Final Thoughts:

- Plants can migrate to the areas (zones) best suited for their growth
- If you select a plant from the grass/grass-like Plant Type, be sure to mark/flag the planted area so you can distinguish from neighboring turfgrass, etc.
- These charts are starting points—you should get to know the characteristics & cultural needs of each species you select through additional sources



Resources

Our Designer Ditch Brochures:

<https://nanticokeriver.org/publications/>

If in the Nanticoke River watershed, sign up
for a Free Site Visit:

<https://nanticokeriver.org/sitevisit>

Thank you!



John Sandkuhler, Restoration Coordinator

johnsandkuhler@nanticokeriver.org

410.622.3669