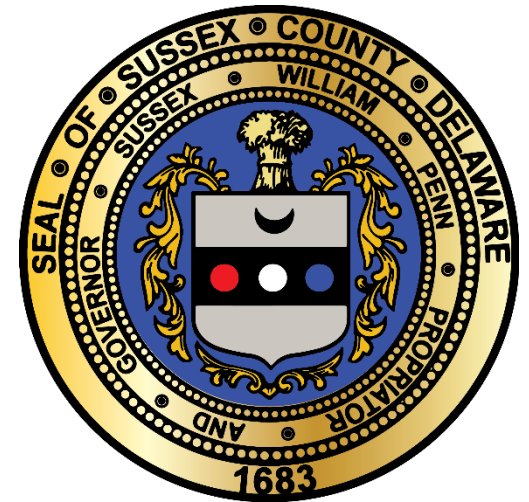
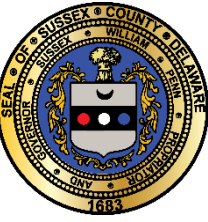




# Sussex County Wetlands & Buffers Working Group

Sussex County West Complex Building  
22215 N. DuPont Blvd, Georgetown, DE  
Wednesday, May 15  
2:00 pm – 5:00 pm





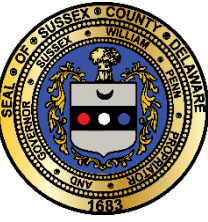
# Process Reminders

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- Working Group Etiquette
- Role of Audience
- Definitions can be revisited
- Information Distribution





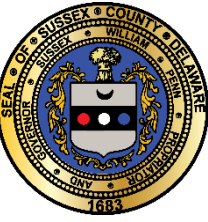


# Agenda

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1. Review Prior Meeting
2. Buffer Approaches
3. Discuss Draft Ordinance Preamble
4. Next Meeting

Meeting Objective:  
to identify mutually-agreeable buffer approaches and to get reactions to the draft ordinance preamble.



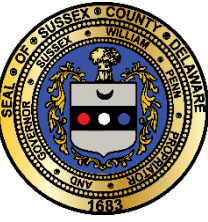
# Meeting Outcomes, 4/17

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1. Reviewed homework outcomes
2. Determined which buffer functions to manage for:
  - Water Quality
  - Habitat
  - Flood Mitigation / Drainage
3. Began density discussion





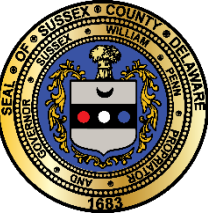


# Assumptions

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- Resources Are Important
- Buffers Are Important
- Purpose/Goals Buffers/Resources: Water Quality, Habitat, Flood Mitigation
- There are System Wide and Resource Specific Benefits
- Ordinance Should Consider Flexibility in Achieving the Goals Through Waiver and Incentive Programs
- Resources/Buffers Placed in Recordable Lot or Easement
- Buffers/Resources Should Not Reduce Land Development Density
- Sussex County Staff Can/Will Develop/Administer a Program with Flexibility





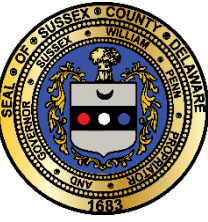
# Buffer Approaches

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- Mapping and Widths
- General Program Philosophies
- Incentive Programs
- Management Zones / Tiers
- Matrices
- Waivers
- Offsets
- Unique Sites / Uses







# Mapping and Widths

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## Delineations Methods

Tidal Wetlands/Waters

NonTidal Wetlands

Perennial/Intermittent/Ephemeral Streams

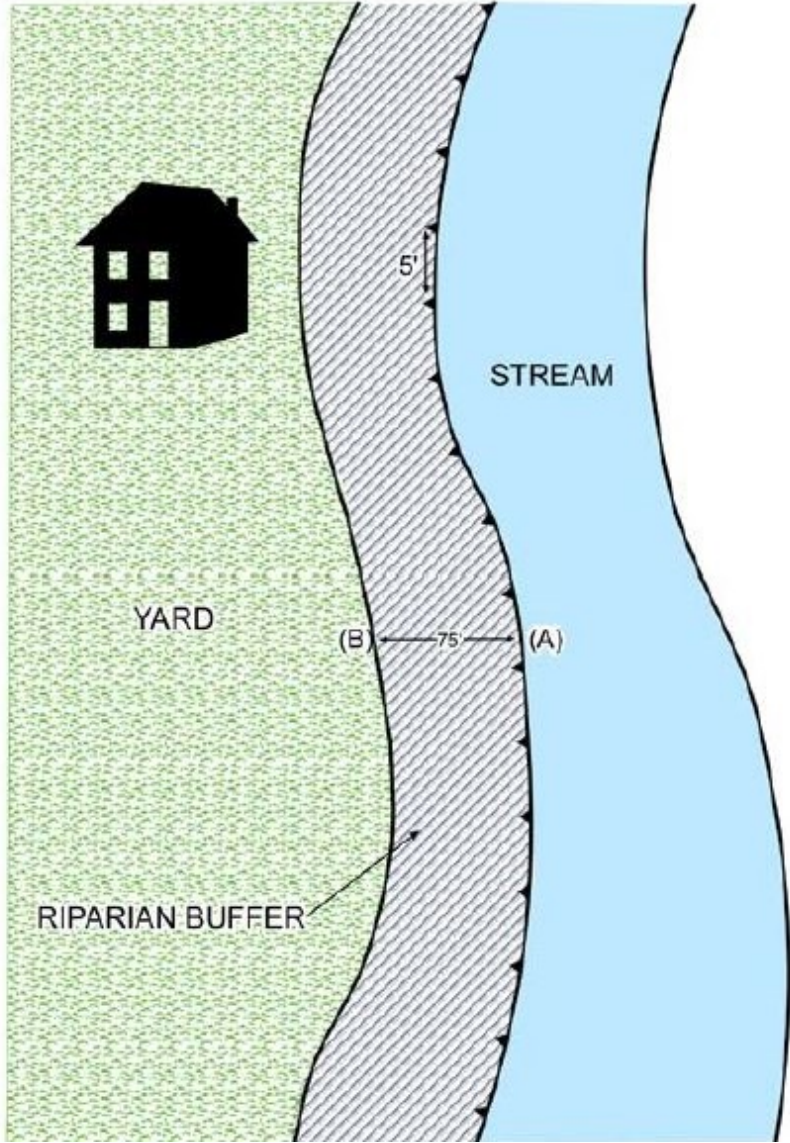
Buffers

Buffer Widths



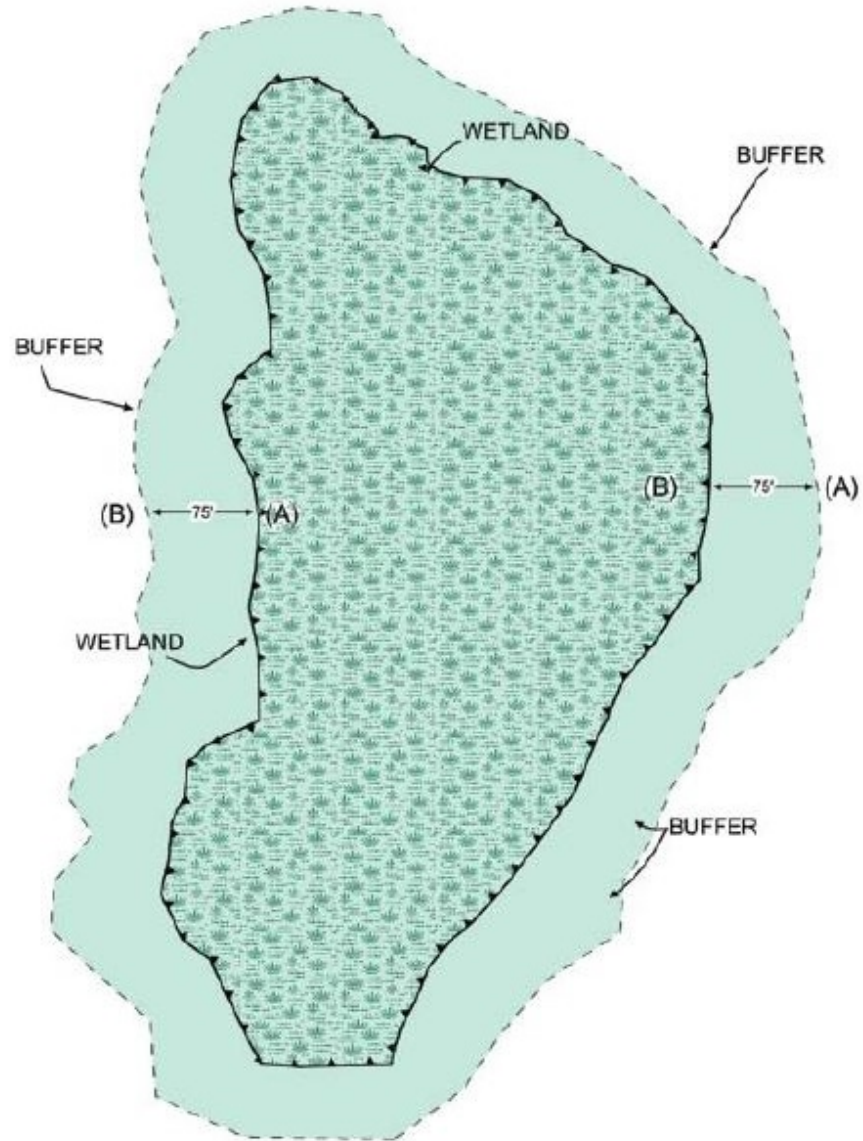


### MEASUREMENT OF BUFFER ALONG WATERCOURSE



### WETLAND BUFFER

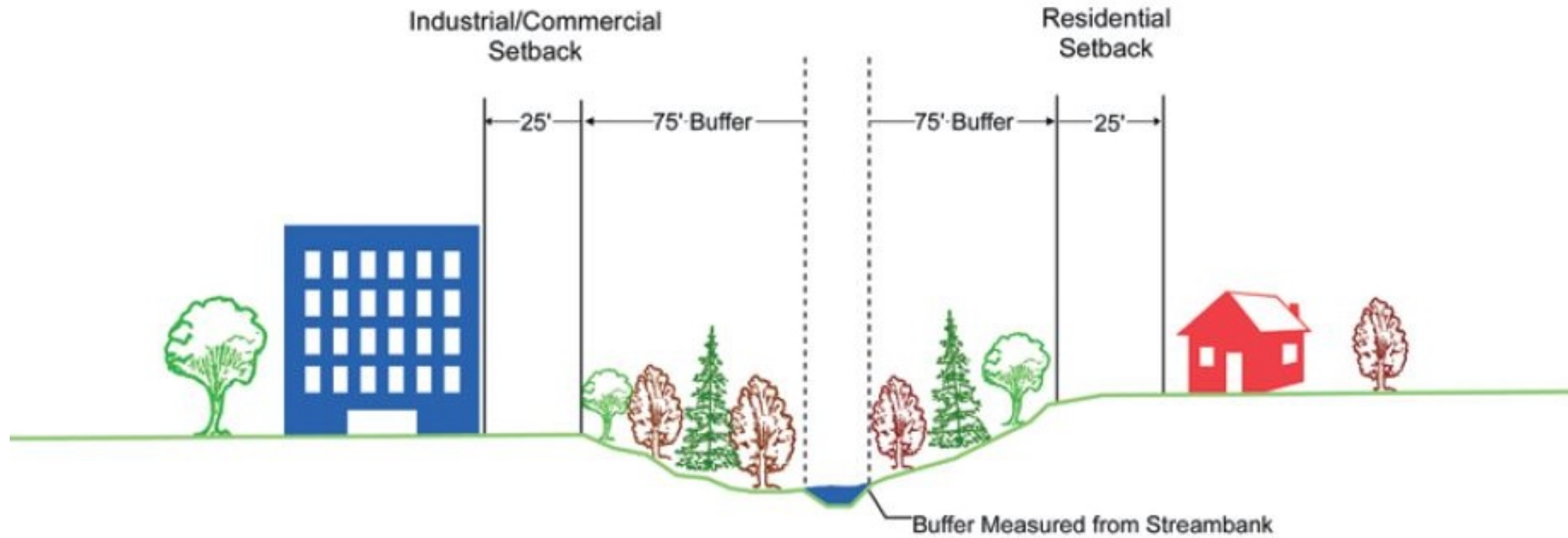
BUFFER IS MEASURED FROM DEFINED EDGE OF WETLAND





# WATERCOURSE BUFFER

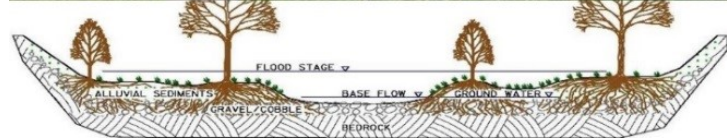
BUFFER IS MEASURED FROM STREAMBANK



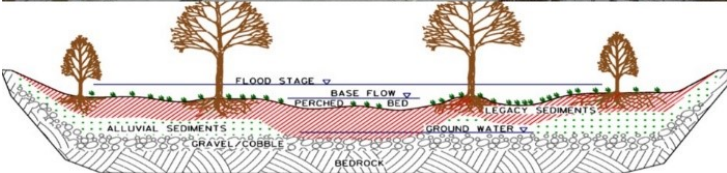




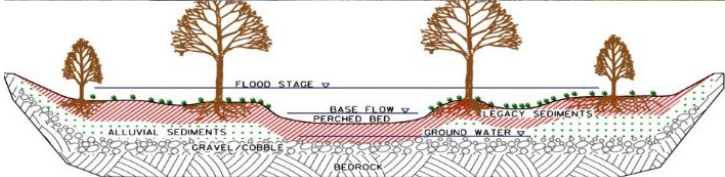
**Pre-Settlement Conditions**  
*Floodplain and channel(s) connected to groundwater with expansive wetlands*



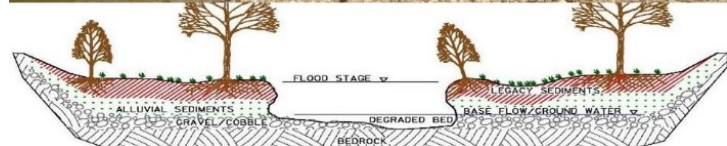
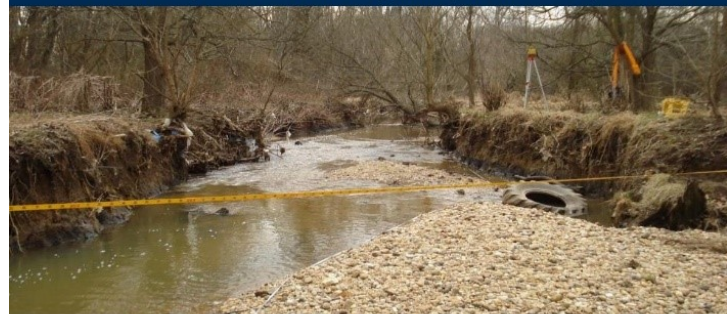
**Common Post-Settlement - Form A**  
*Non-incised and perched streambed – primarily wetland riparian zone*



**Common Post-Settlement - Form B**  
*Incised and perched streambed – primarily non-wetland riparian zone*



**Common Post-Settlement - Form C**  
*Incised and non-perched streambed – primarily non-wetland riparian zone*

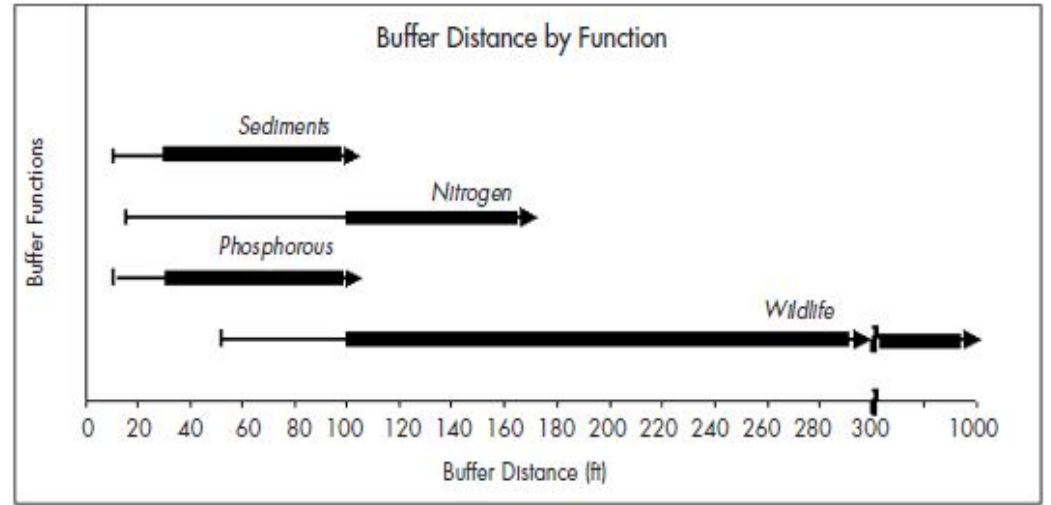
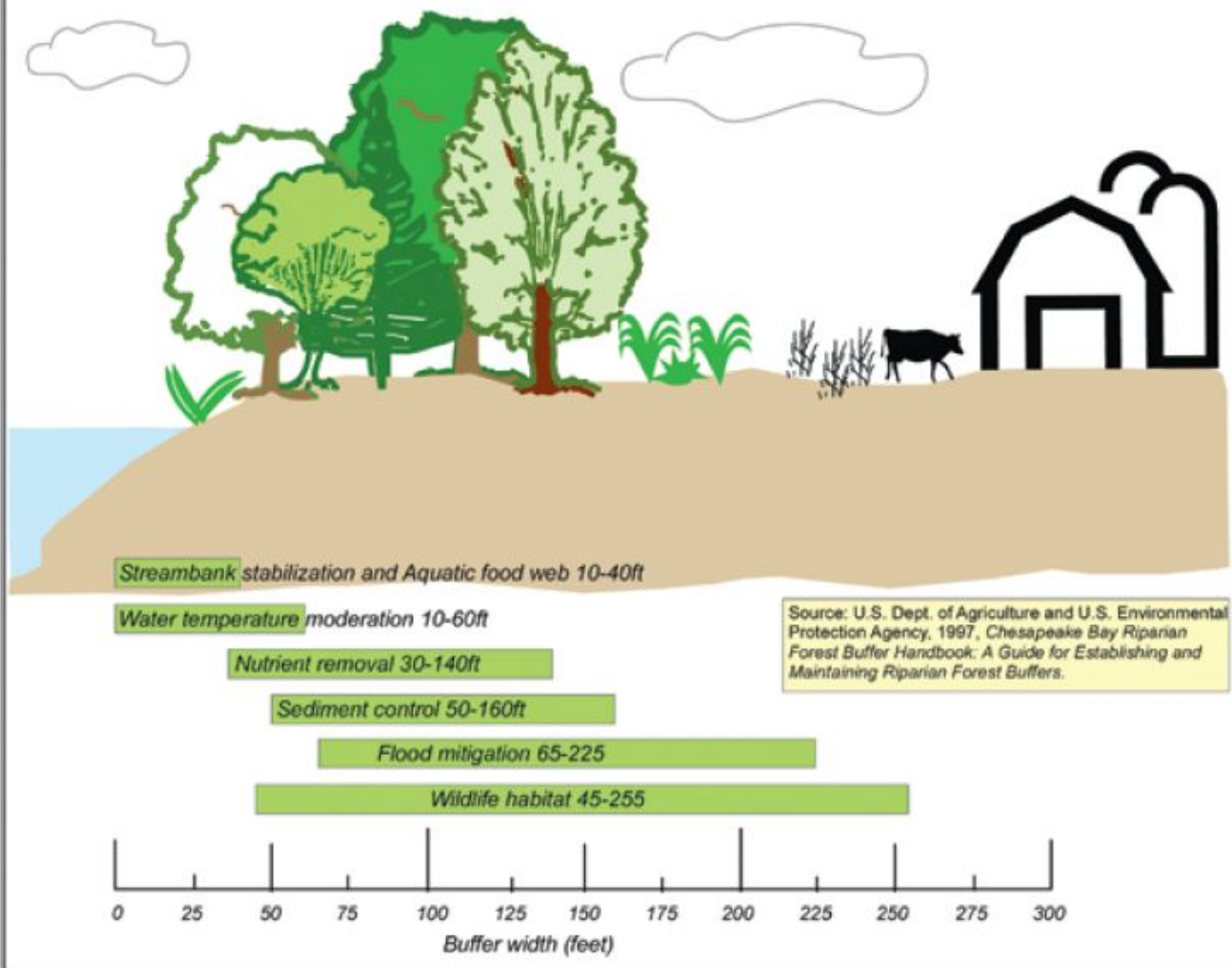


**Common Post-Settlement - Form D**  
*Incised and relocated channel perched on valley margin bedrock or colluvium – primarily non-wetland riparian zone*





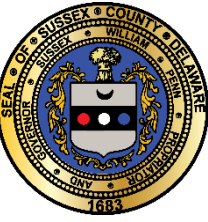
**FIGURE 1**  
**USDA RECOMMENDED BUFFER WIDTHS**



Effective buffer distance for water quality and wildlife protection functions. The thin arrow represents the range of potentially effective buffer distances for each function as suggested in the science literature. The thick bar represents the buffer distances that may **most** effectively accomplish each function (30 - > 100 feet for sediment and phosphorous removal; 100 - > 160 feet for nitrogen removal; and 100 - > 300 feet for wildlife protection. Depending on the species and the habitat characteristics, effective buffer distances for wildlife protection may be either small or large.

**BUFFER WIDTHS**

- Baseline Range: 15 – 100 feet
- Waiver Range: 0 – 200 feet



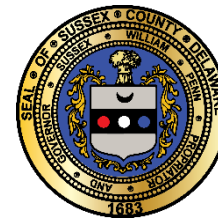
# General Program Philosophies

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- Well-defined program guidance documents
- General references to general approaches
- Systematic or Resource-Specific Protection
- Quality Resources or Degraded Resources
- Other







# General Program Philosophies

Do we...

Prepare a prescriptive program that has many details and guidance documents, but potentially reduces land planning creativity for sustainable projects?

OR

Prepare a flexible program that supports creative solutions but that cannot guarantee that the same protections are applied universally?

OR

Reference general guidelines for goals and approaches, and defer to site-specific reviews and applicant justifications based on a minimum baseline?

Is the goal to...

Provide protection / enhancement to the system as a whole?

OR

Provide protection to / enhance each resource?

OR

Both?

Do we prioritize...

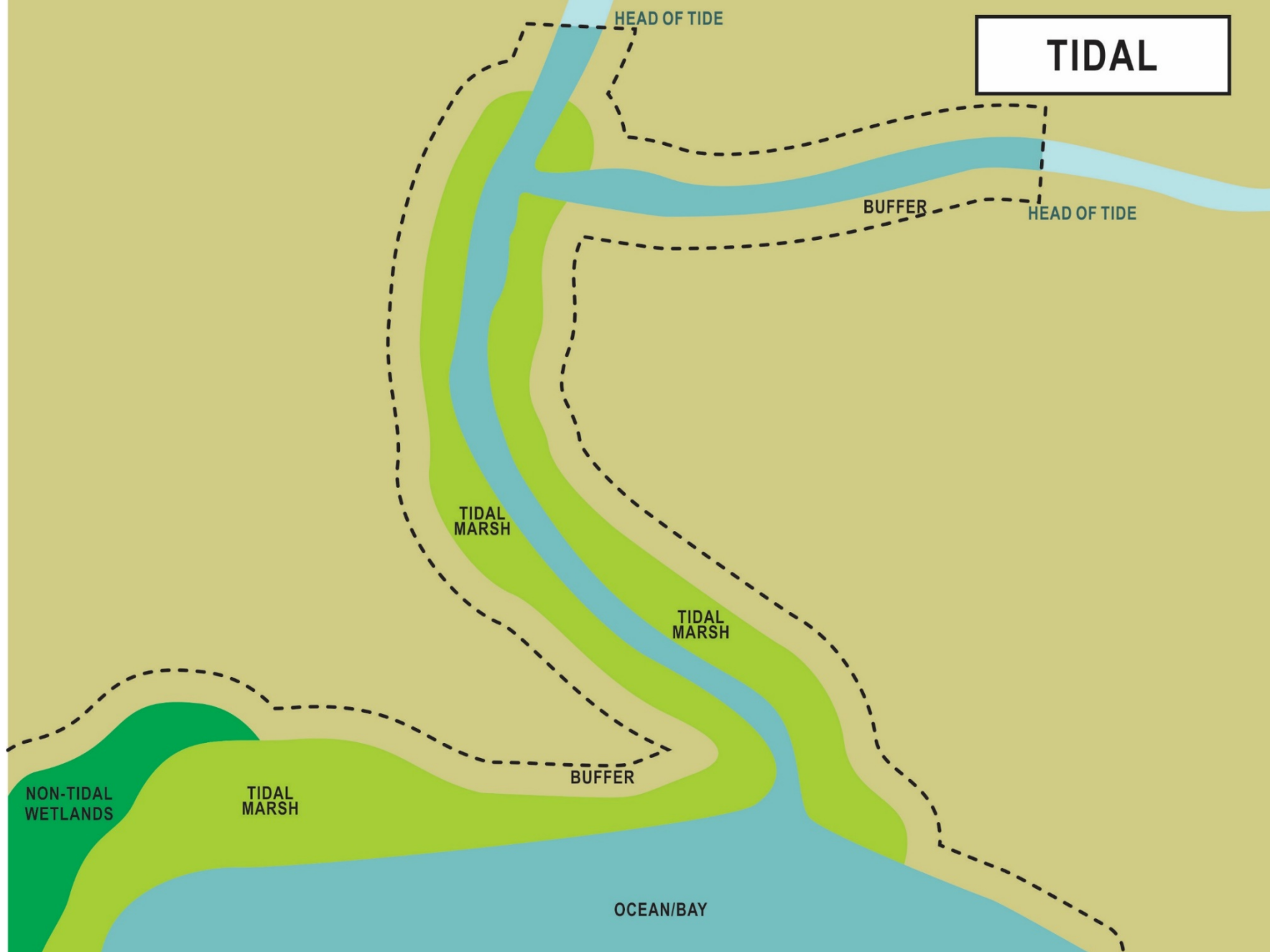
Degraded systems and incentivize them for improvements?

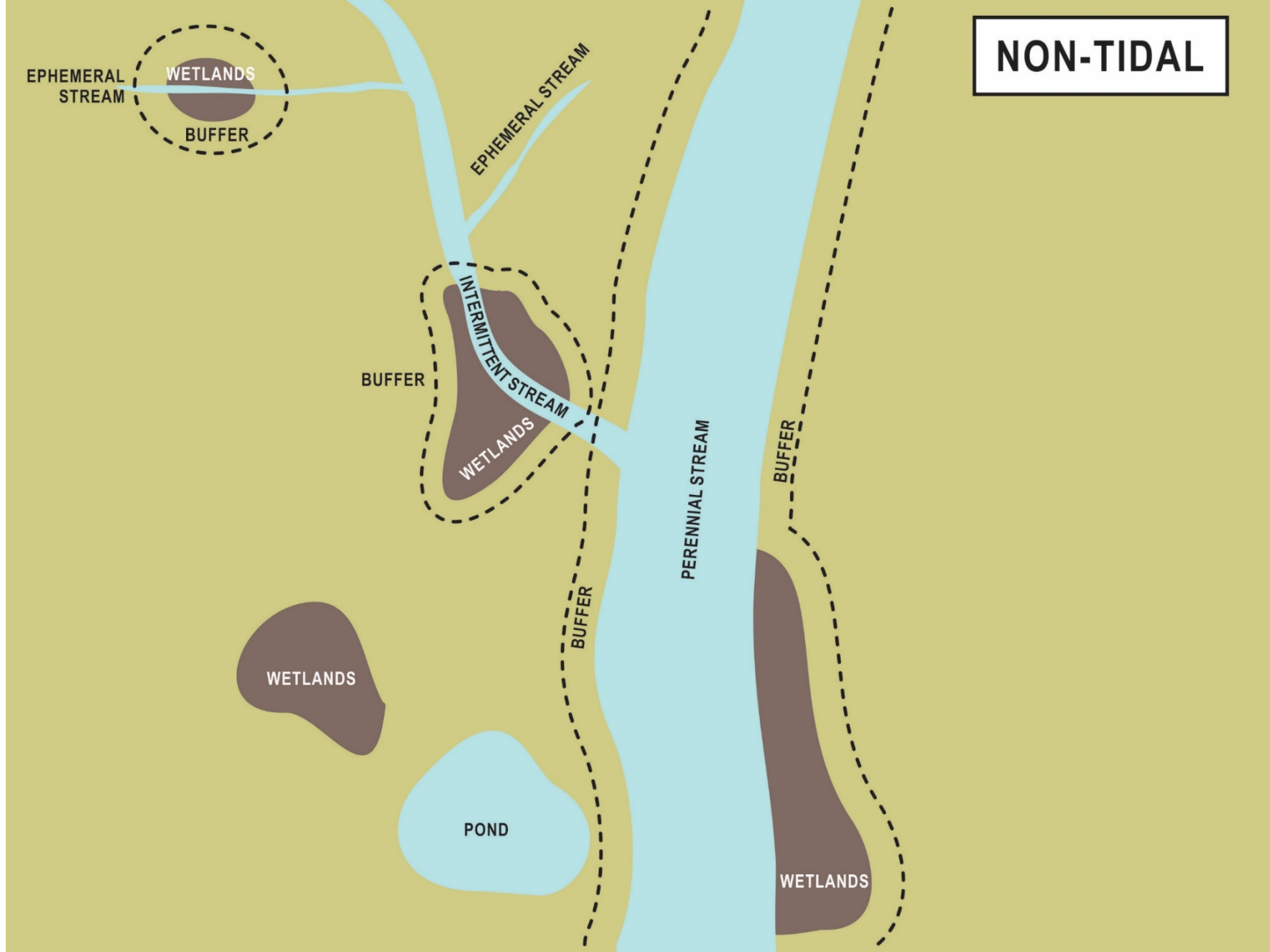
OR

Protecting high-quality systems / resources?





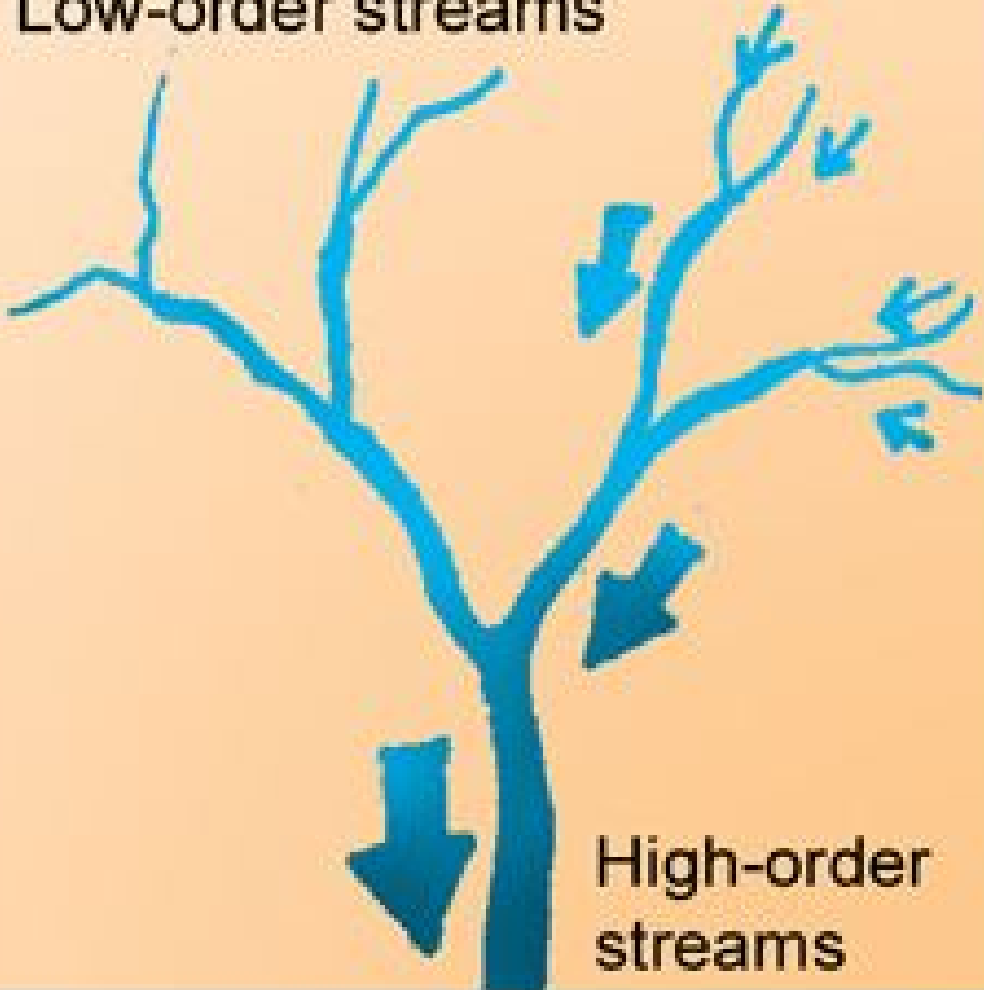




**NON-TIDAL**

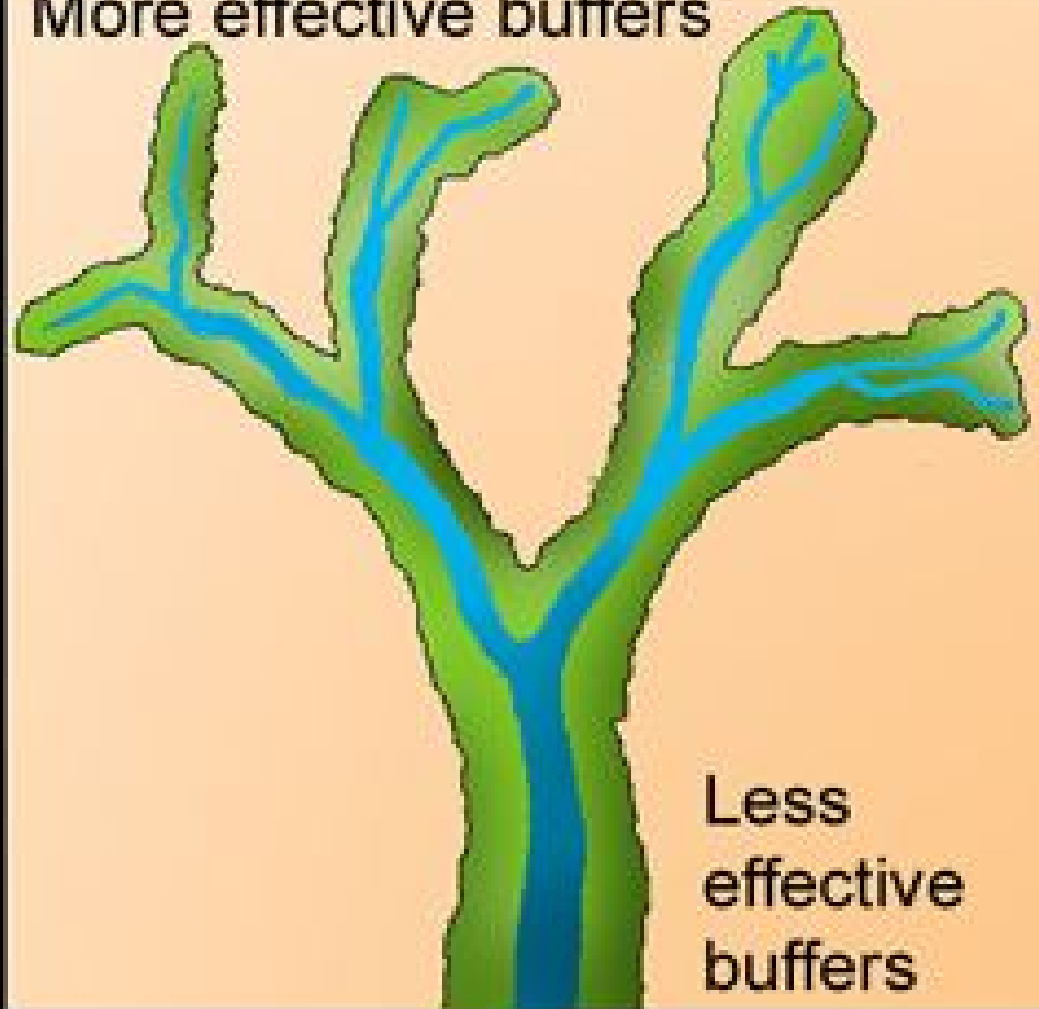


Low-order streams

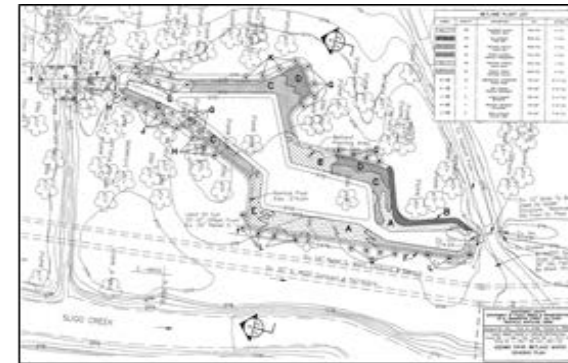


High-order streams

More effective buffers



Less effective buffers



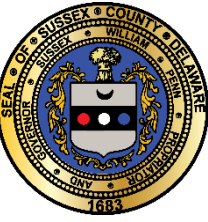




# Creative Land Use Approaches

- Systematic protection
- Single resource protection
- Management Tiers/Zones
- Matrices
- Waiver / Hardship Program
- Offsets
- Incentive Programs
- Other





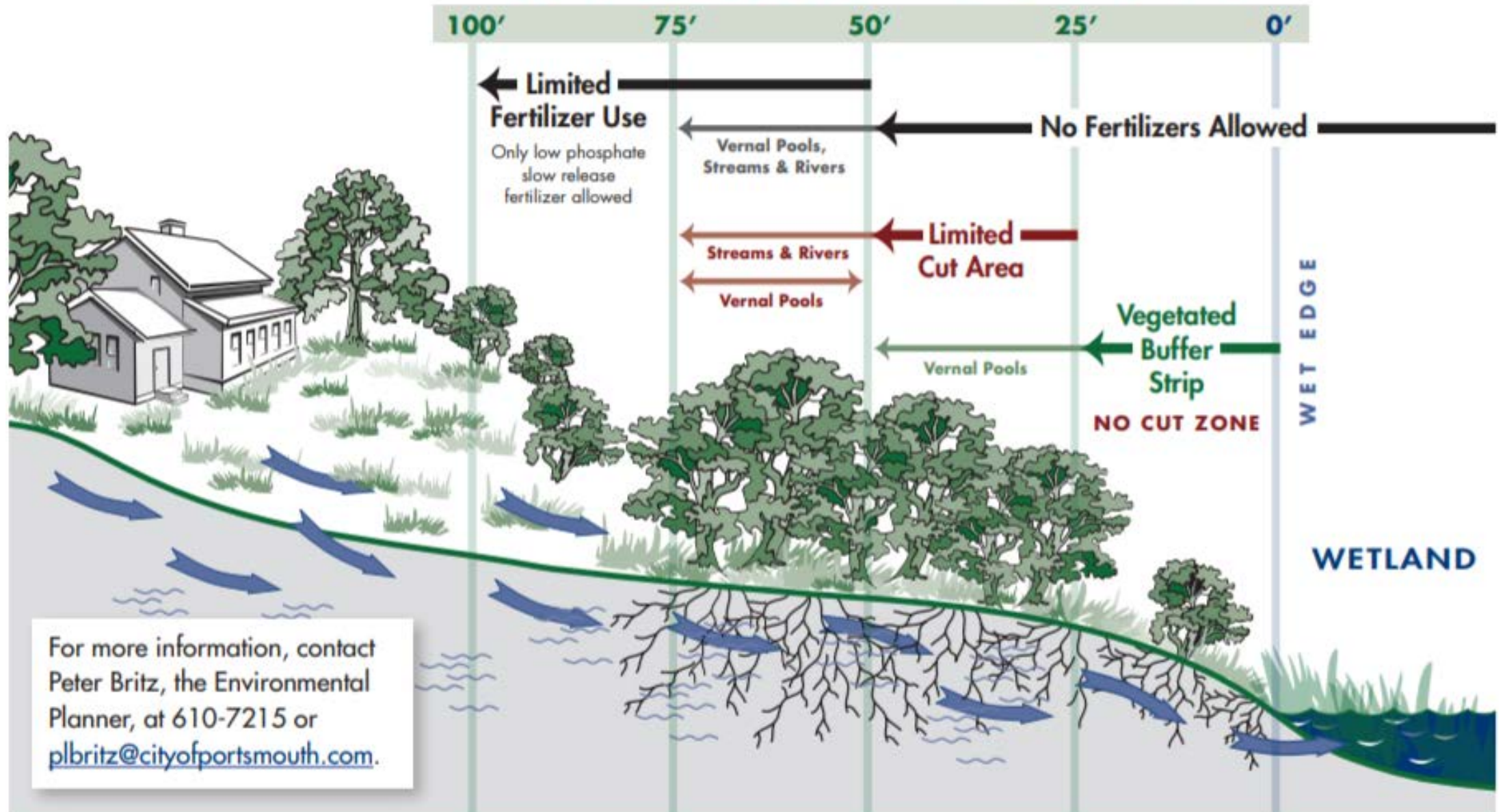
# Management Zones

- Tiered Restrictions by Land Use: the buffer zones have different requirements (widths, restrictions, maintenance, etc.). Two- and three-zone buffers are common. The widths are based on the land use adjacent to the resource; specifically, what potential impacts the land use could have on the resource.
- Tiered Restrictions by Resource Type: this option is similar to above; however, the basis for zones/tiers widths, etc. is the resource being protected rather than the land use adjacent, and what functions the buffer would need to provide for the resource.

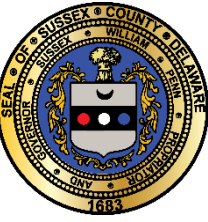




# WETLAND BUFFER



For more information, contact Peter Britz, the Environmental Planner, at 610-7215 or [plbritz@cityofportsmouth.com](mailto:plbritz@cityofportsmouth.com).



# Matrices

- Resource Type Matrices: Evaluates buffers based on the resource type, this matrix assumes all resources being protected should not have same buffer width. This system usually works when a variety of resources are included, such as forests, protected species habitat, floodplains, wetlands, streams, ponds/lakes, etc.
- Quality of Resource Matrix: evaluates the quality of the resource. The higher quality the resource, or those resources with more documented functions receive wider buffers.
- Site Condition/Drainage Matrix: evaluates the buffers based on site drainage patterns (slope, sheet flows, swales, etc. This matrix focuses on benefits to managing water/drainage.
- Land Use Type – Density: Evaluates the land use proposed adjacent to the resource, and more impactful uses (higher impervious cover, potential groundwater impacts [landfills, industrial discharges, site WW treatment facility, etc.]) require wider buffers.



**TABLE 1  
RELATIONSHIP OF VEGETATION TYPE  
TO RIPARIAN BUFFER EFFECTIVENESS**

Benefit	Vegetation Type		
	Grass	Shrub	Tree
Stabilize bank erosion	Low	High	High
Filter sediment	High	Low	Low
Filter nutrients, pesticides, microbes			
• Sediment bound particle removal	High	Low	Low
• Soluble particle removal	Medium	Low	Medium
Aquatic habitat	Low	Medium	High
Wildlife habitat			
• Range/pasture/prairie wildlife	High	Medium	Low
• Forest wildlife	Low	Medium	High
Flood protection	Low	Medium	High
Water temperature	Low	Low	High

*Source: Natural Resource Conservation Service.*

Wetland Category		Standard Buffer Width (ft)
Category I:	Natural Heritage or bog wetlands	215
	Habitat score 29-36	200
	Habitat score 20-28	150
	Not meeting above criteria	125
Category II:	Habitat score 29-36	150
	Habitat score 20-28	100
	Not meeting above criteria	75
Category III:	Habitat score 20-28	75
	Not meeting above criteria	50
Category IV:		50

*Sammamish, Washington, ordinance: Wetlands rated according to the Washington State Wetland Rating System for Western Washington (Washington Department of Ecology, 2004, or as revised).*

# Appendix II. Matrix Approach to Buffer Distance

Island County, Washington:

This excerpt is based on Island County’s draft ordinance from November 2007... The ordinance first prescribes buffers for a few types of particularly sensitive wetlands...with wider buffers for more intensive uses. Then it establishes matrices to calculate buffers for other wetlands based on land use intensity, habitat condition, and wetland sensitivity (as predicted by slope and presence or absence of a surface water outlet). Wetlands that lack outlets are adjoined by steep slopes are presumed to be more sensitive to accumulation of sediment and contaminants, so receive larger buffers. For most wetlands both habitat and water quality buffers are calculated separately and the larger buffer (usually habitat) is applied.

Habitat Buffers					
Land use Intensity	Habitat Functions Score				
	50 or higher	42-48	39-41	32-38	Less than 32
Low	150 ft	125 ft	100 ft	75 ft	Use Water Quality & Slope Tables
Moderate	225 ft	175 ft	150 ft	110 ft	
High	300 ft	200 ft	175 ft	150 ft	

The water quality calculation includes differing buffers based on wetland type (A-E) and whether there is a surface water outlet from the wetland.

Water Quality Buffers						
Land Use Intensity	Wetland Category					
	Wetland Outlet	A	B	C	D	E
Low	Yes	40 ft	35 ft	30 ft	25 ft	20 ft
	No	75 ft	50 ft	40 ft	35 ft	25 ft
Moderate	Yes	90 ft	65 ft	55 ft	45 ft	30 ft
	No	105 ft	90 ft	75 ft	60 ft	40 ft
High	Yes	125 ft	110 ft	90 ft	65 ft	40 ft
	No	175 ft	150 ft	125 ft	90 ft	50 ft

The water quality value is then adjusted for slope:

Slope Adjustment	
Slope Gradient	Additional Buffer Multiplier
5-14%	1.3
15-40%	1.4
>40%	1.5

This matrix approach is more complex than a single number, but can better reflect scientific understanding, particularly with diverse wetland types and land use conditions in a locality. With appropriate public outreach and technical support, a matrix-driven buffer can gain public support and achieve good results.



Figure 2 Riparian buffer width always greater than or equal to 50 feet, piedmont / coastal plain site.

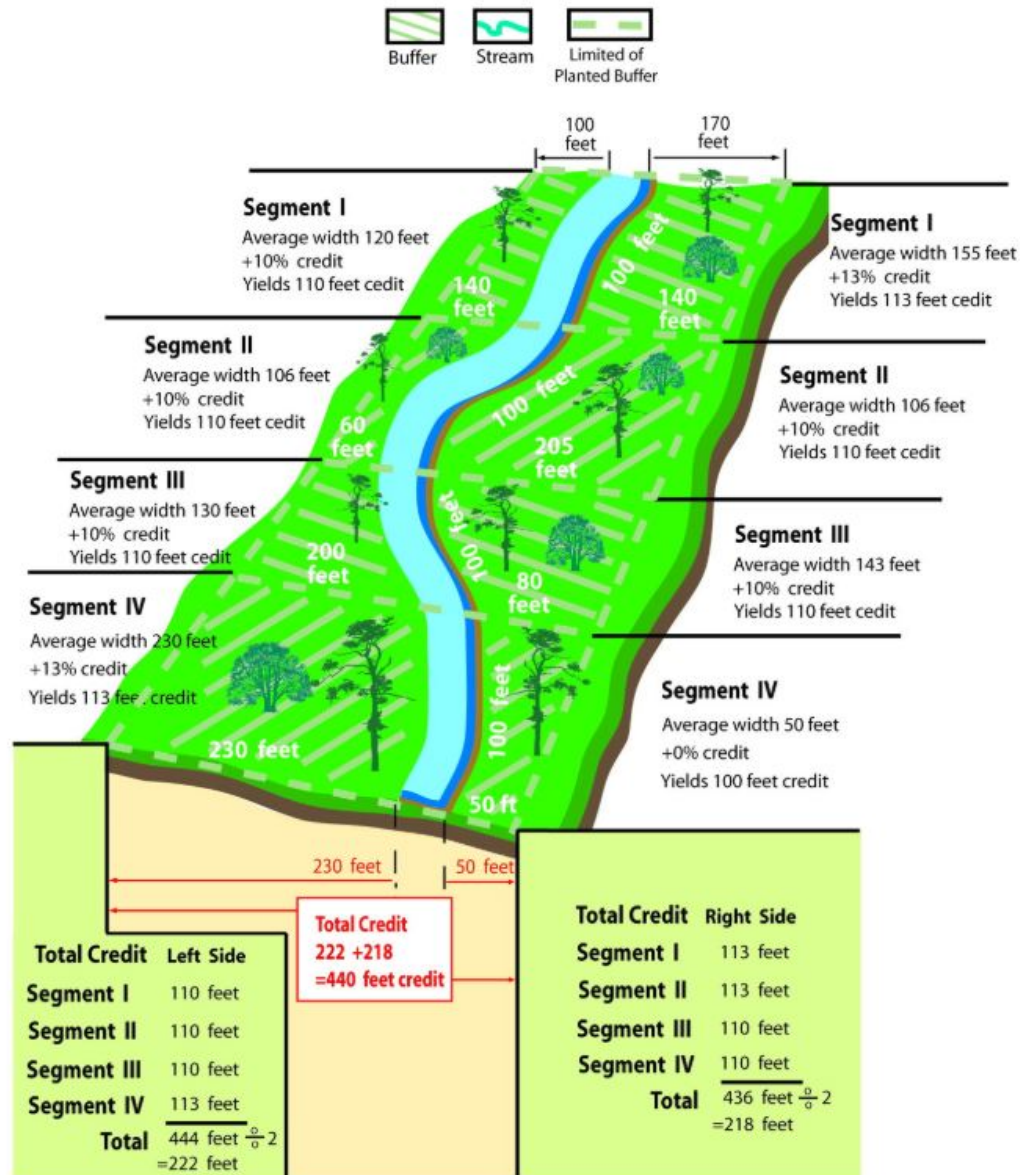
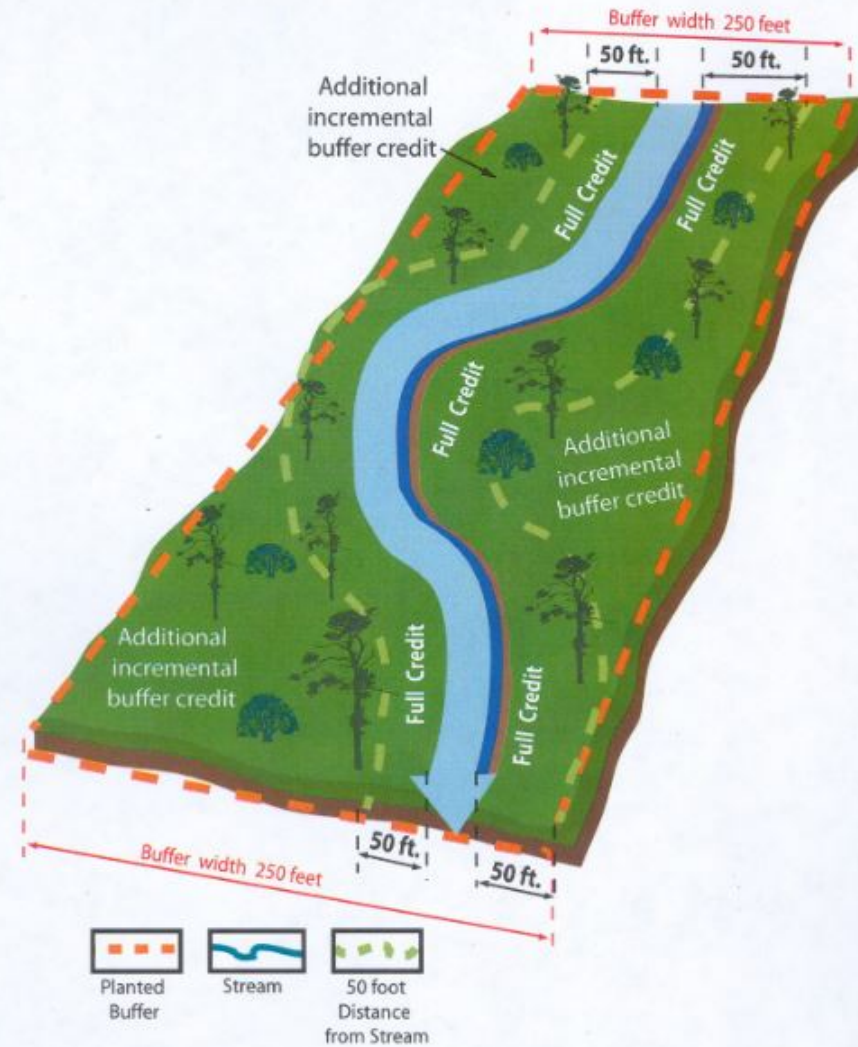
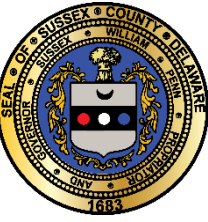


Figure 4 Riparian buffer width always at least 50 feet wide.

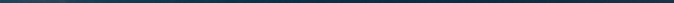




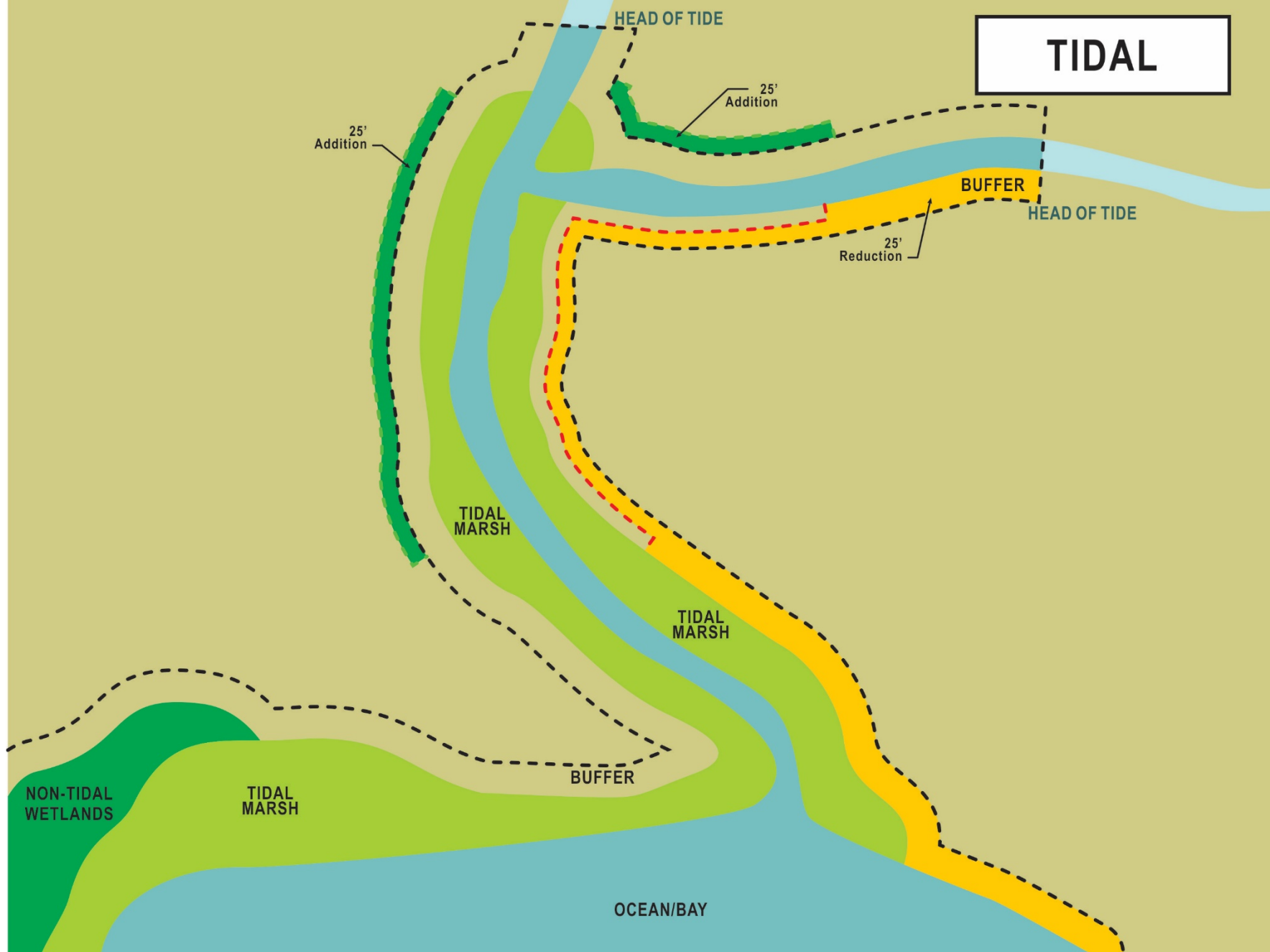
# Waivers

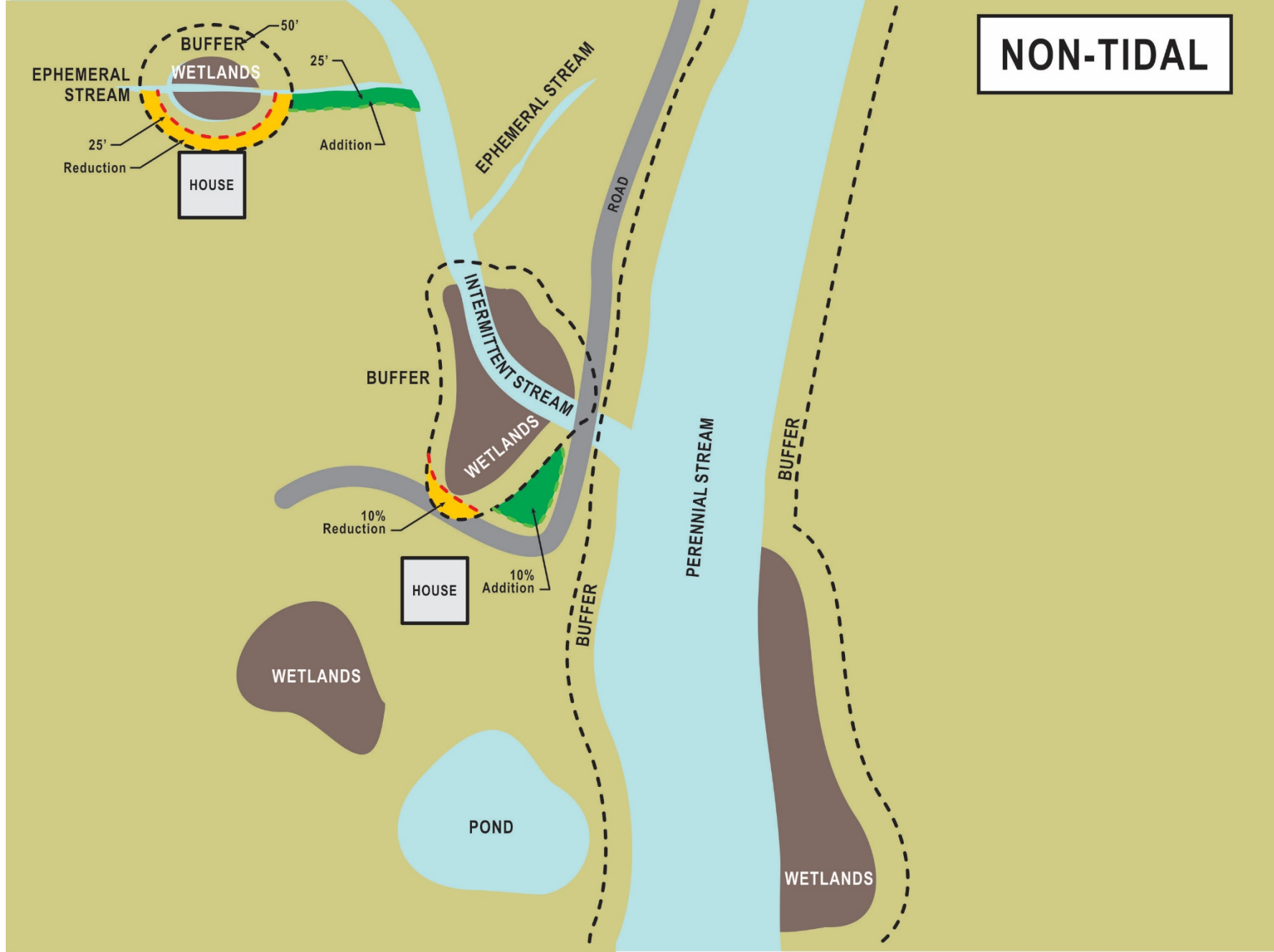
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- Hardship: this waiver is included in many programs, and recognizes that not all sites are the same, and that site configuration or land use can have unique considerations. This type of waiver usually defines a hardship and often has a mitigation alternative.
- Site Size: this waiver is included to provide relief to small single-family lots, grandfathered lots, redevelopment uses, etc.
- Averaging: this waiver allows an applicant to reduce the buffer width/area on a portion of the property in exchange for same width/area on another portion of the property. Averaging programs usually have a minimum buffer width that must be maintained and maximum width that cannot be exceeded.













# Offsets

- On-Site Improvements: an applicant could offer exceeding Code for stormwater management (SWM) for water quality, forest protection, open space preservation, or other techniques on the site in exchange for reduced buffers. In this offset the applicant would need to demonstrate how the offset met the goals and purposes defined in the code for buffers.
- Off-Site Improvements/Restoration of Resources: Off-site improvements may include performing restoration of a resource defined in the code (such as a degraded stream/wetland) in exchange for reducing buffers. This could be for resources adjacent or up- or down-stream of the development site. This category could also include SWM and forest protection. This offset is similar to the on-site improvements above but are on adjacent lands (provided they are in same subwatershed).
- Fees to County: rather than the developer implementing the improvements, the developer would pay a fee to Sussex County to implement the improvements which the County would then own/maintain.
- Trading Buffer Adjacent Lands/Upstream: an applicant could work with an adjacent property owner (developed or undeveloped) and provide a buffer on their property for reduced buffer on the development property. This off-site land would need to be included in an easement or subdivided out of the existing property. This option would be similar to a Buffer Averaging Waiver and could be used to create forested buffers on developed sites that have been grandfathered or on agricultural lands in Conservation/Preservation programs.







**Pre-Restoration**



**Pre-Restoration**



**Post Restoration**



**Post Restoration**

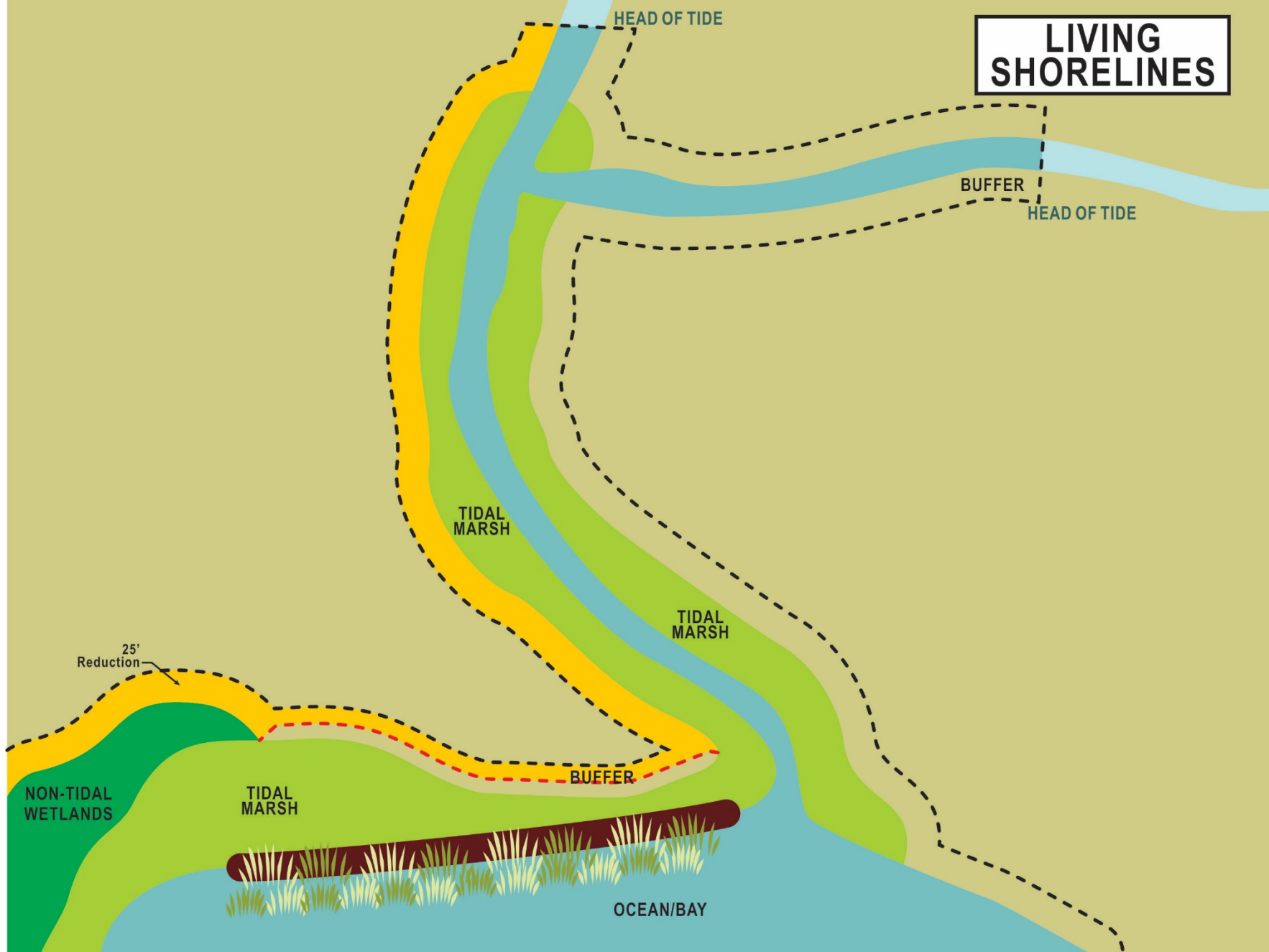




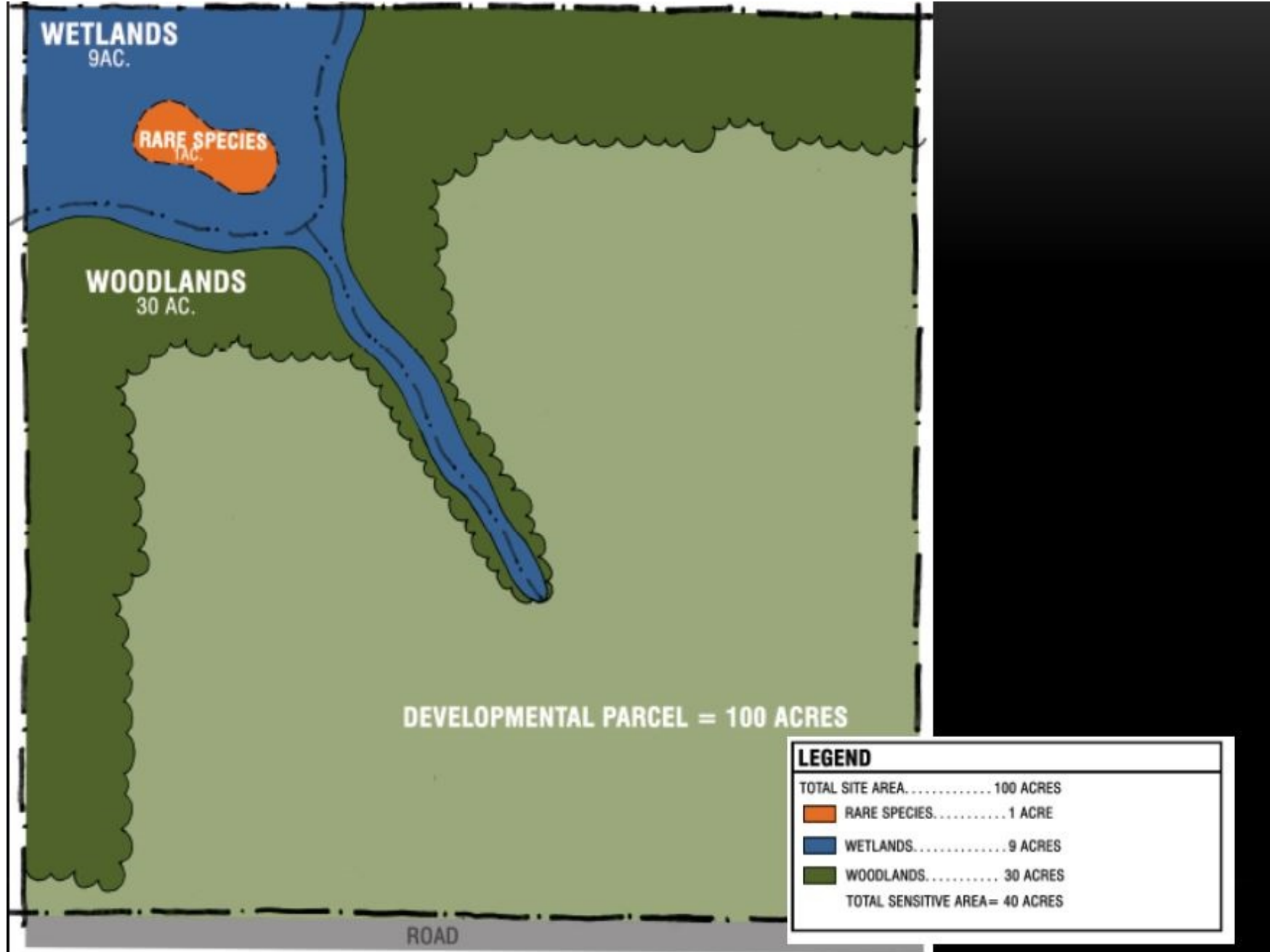
# Incentive Programs

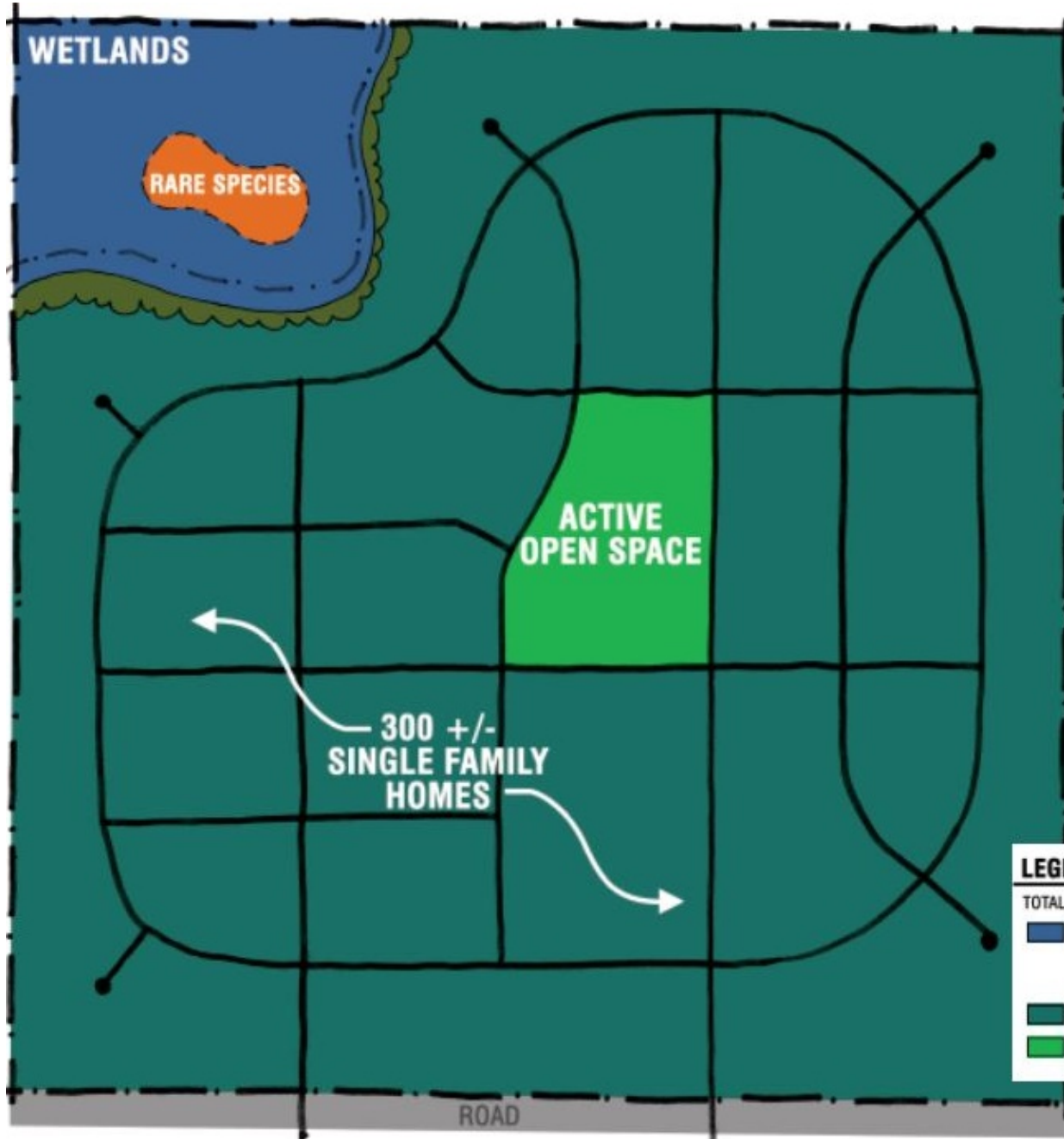
- Save Mature Trees: can a landowner be incentivized to retain mature trees on a property rather than clear-cutting to the resource edge by offering reduced buffer widths, or reductions in other code requirements?
- Plant Trees Pre-construction: can a landowner be incentivized to plant/vegetate a buffer with approved plantings prior to development (rather than having un-stabilized soils during construction) by offering reduced buffer widths or reductions in other code requirements?
- Living Shoreline for tidal buffer reduction: in the tidal portions of the watershed, can an applicant provide a living shoreline for a tidal marsh edge or bank in lieu of a buffer or for a reduced buffer width (i.e., provide protection for a resource waterward instead of landward)?
- Perimeter Buffer Exchange: a Sussex County-identified potential incentive to add to code. The concept would be to reduce perimeter buffers in exchange for buffers to resources. The idea would be to not limit site densities by exchanging the restricted areas.









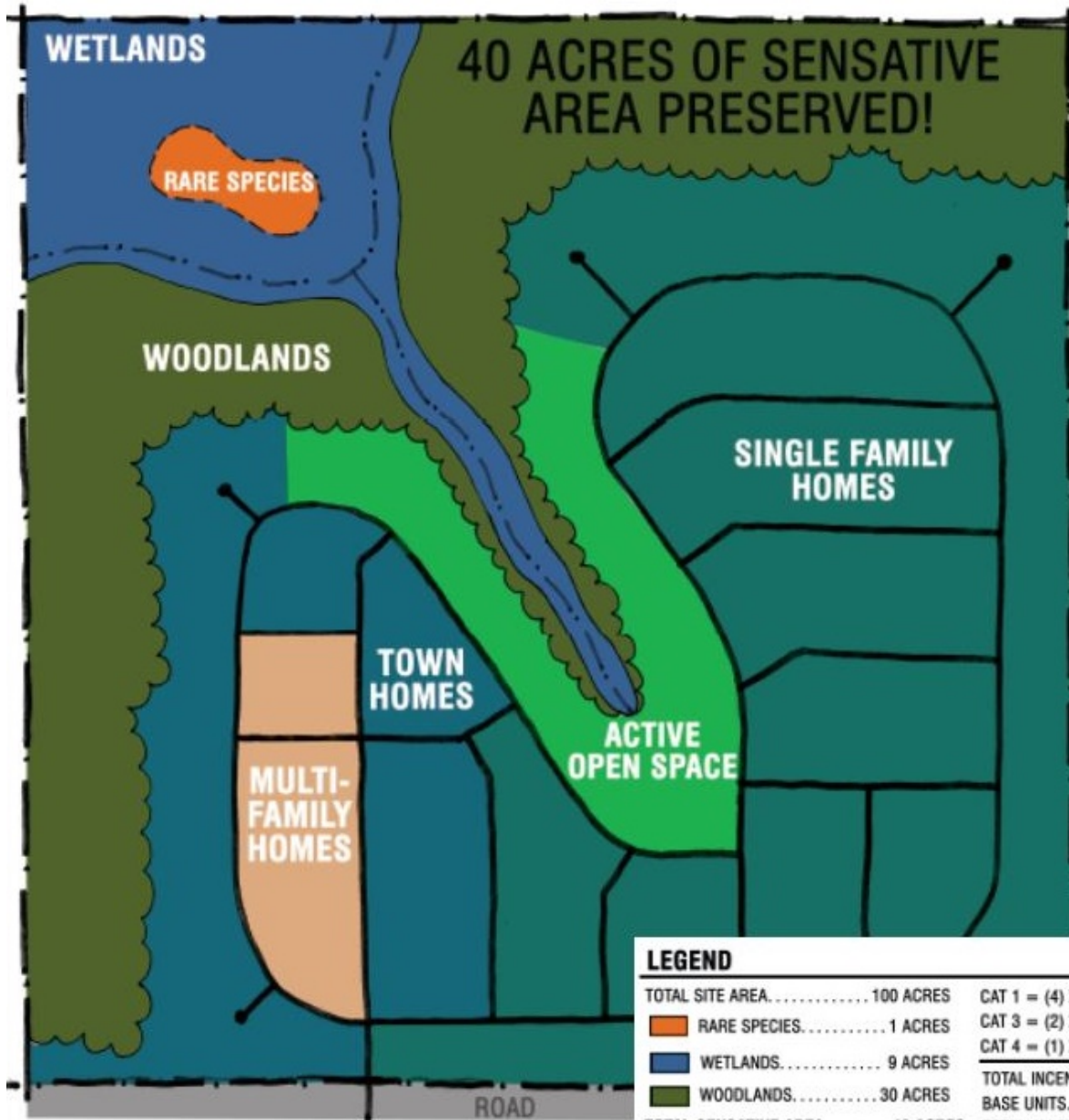


TOTAL DENSITY  
= 3 UNITS/ACRE

**LEGEND**

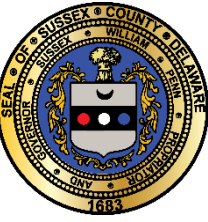
- TOTAL SITE AREA..... 100 ACRES
- WETLANDS..... 10 ACRES
- ALLOWABLE DEVELOPMENT... 100 ACRES
- 100 AC X3 LOTS/ACRE..... 300 UNITS
- SINGLE FAMILY UNITS.... 30 ACRES
- OPEN SPACE





TOTAL DENSITY  
= 4.56 UNITS/ACRE

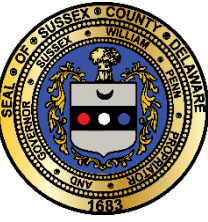
LEGEND		UNIT COUNTS	
TOTAL SITE AREA.....	100 ACRES	CAT 1 = (4) X 1ac X (3).....	12
RARE SPECIES.....	1 ACRES	CAT 3 = (2) X 9ac X (3).....	54
WETLANDS.....	9 ACRES	CAT 4 = (1) X 30ac X (3).....	90
WOODLANDS.....	30 ACRES	TOTAL INCENTIVE UNITS.....	156
TOTAL SENSATIVE AREA.....	40 ACRES	BASE UNITS.....	300
TOTAL AREA REMAINING.....	60 ACRES TO BE DEVELOPED	TOTAL ALLOWABLE UNITS.....	456
		SINGLE FAMILY-COTTAGE AND SINGLE LOTS.....	202 UNITS
		TOWNHOMES.....	158 UNITS
		MULTI-FAMILY.....	96 UNITS
		OPEN SPACE.....	
		TOTAL LOTS.....	456



# Unique Sites / Uses

- Environmental Learning Centers/Waterfront Uses: many programs identify special land uses that need to be in close proximity with the water's edge. Some programs use the Waiver program for all uses, but some identify these special uses and allow case-by-case submittals for buffer compliance or create separate buffer program for these uses.
- Sites <1 acres, <5 acres: many programs include a Waiver or Exceptions for smaller sites in categories <1 acre, < 5 acres, etc. Site size can be significantly influenced by resources and buffers for certain land uses. These clauses are intended to reduce "Land/Development Rights" takings filings.
- Industrial Processes: Ordinances often indicate that buffer widths are only associated with residential, commercial, or public use land uses, while industrial sites require site-specific evaluation for buffers and always wider and more restrictive than the standard program.



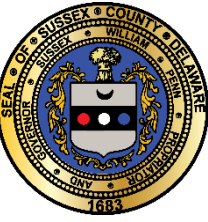


# Ordinance Preamble

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Refer to Suggested Revisions from Group





# Next Meeting

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- Wednesday, May 29
- Anticipated Goals
- Homework

