

# *Planting Trees for Water Quality in Clarke County, Virginia*

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# Project Goals

- Identify priority locations for forest restoration to achieve WIP goals
  - Riparian buffers
  - Residential turf
- Implement planting projects to reforest up to 30 acres

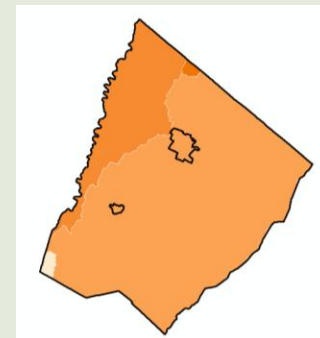
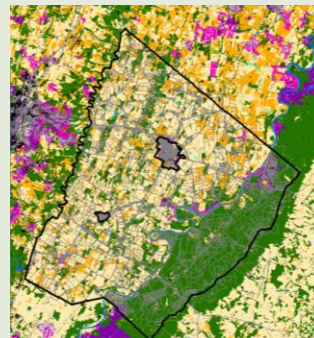
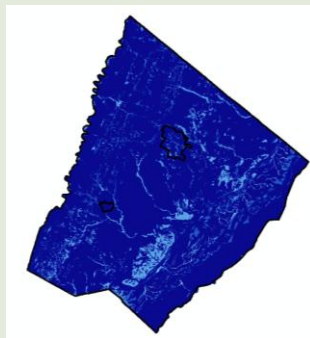
- Planting of riparian forest buffers in the Chesapeake Bay is one of the strategies of the Virginia Phase I WIP
- Research by the USGS and USDA has shown that nutrient removal effectiveness of riparian buffers is dependent on site-specific factors such as the depth to water table, soil properties and topography
- Okay and Feldt (2010) have proposed a GIS-based Riparian Forest Buffer Targeting Matrix to identify areas with greater nutrient removal potential



# Data Layers



Data Layer	Source
Depth to water table	SSURGO
Slope	County 10 foot contours
Land use	CBP watershed model land use data
Nutrient loading	SPARROW model





- Convert all layers to raster (grid) format
- Assign a rank to each cell based on cell values
- Multiply cell rank by weighted layer multiplier
- Sum all grids to get a final grid layer
- Overlay with parcel layer to identify parcels with “high priority” planting areas

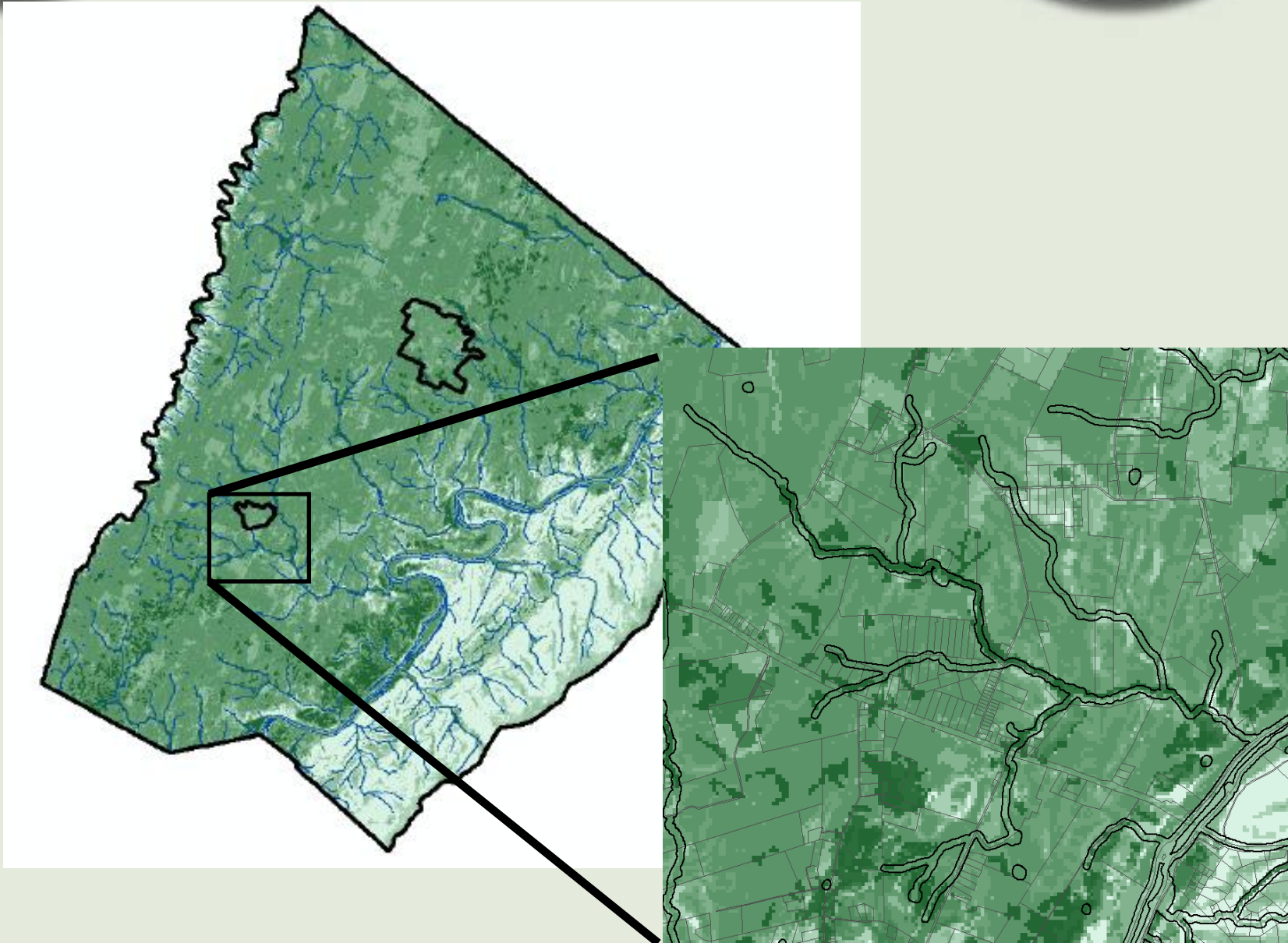


# Layer Ranking



Attribute	Rank					Weight
	4 (high)	3 (med-high)	2 (med-low)	1 (low)	0 (low)	
Depth to Water Table (inches)	0 - 39.37	39.38 – 78.74	N/A	N/A	> 78.74	10
Slope (%)	0-5	5.1-10	10.1-15	N/A	>15	8
Land Use (CBP)	Barren, crop, grassland, pasture/hay, suburban lawns, developed open space	Low and medium intensity developed	Emergent wetlands, shrub/scrub	Deciduous, evergreen, and mixed forest, suburban woods, woody wetlands	High intensity developed, open water, unconsolidated shore	6
Nutrient loading (kg/ha/yr)	>15	10.1-15	5.1-10	1.1-5	0-1	4
Total weight						28

# Final Grid



- Parcels located within 100 feet of stream
- Majority of cells within parcel with rank of 4 (high potential for nutrient removal)
- Drain to impaired waters
- Size > 2 acres
- Results: 14 priority parcels identified



- Data layers included parcels and CBP land use
- Parcels that contain greater than 1 acre of turf and categorized as “suburban lawns” were selected
- Spot check of selected parcels required deletion of road segments
- Results = 36 parcels in 3 “neighborhoods” with turf-to-trees potential

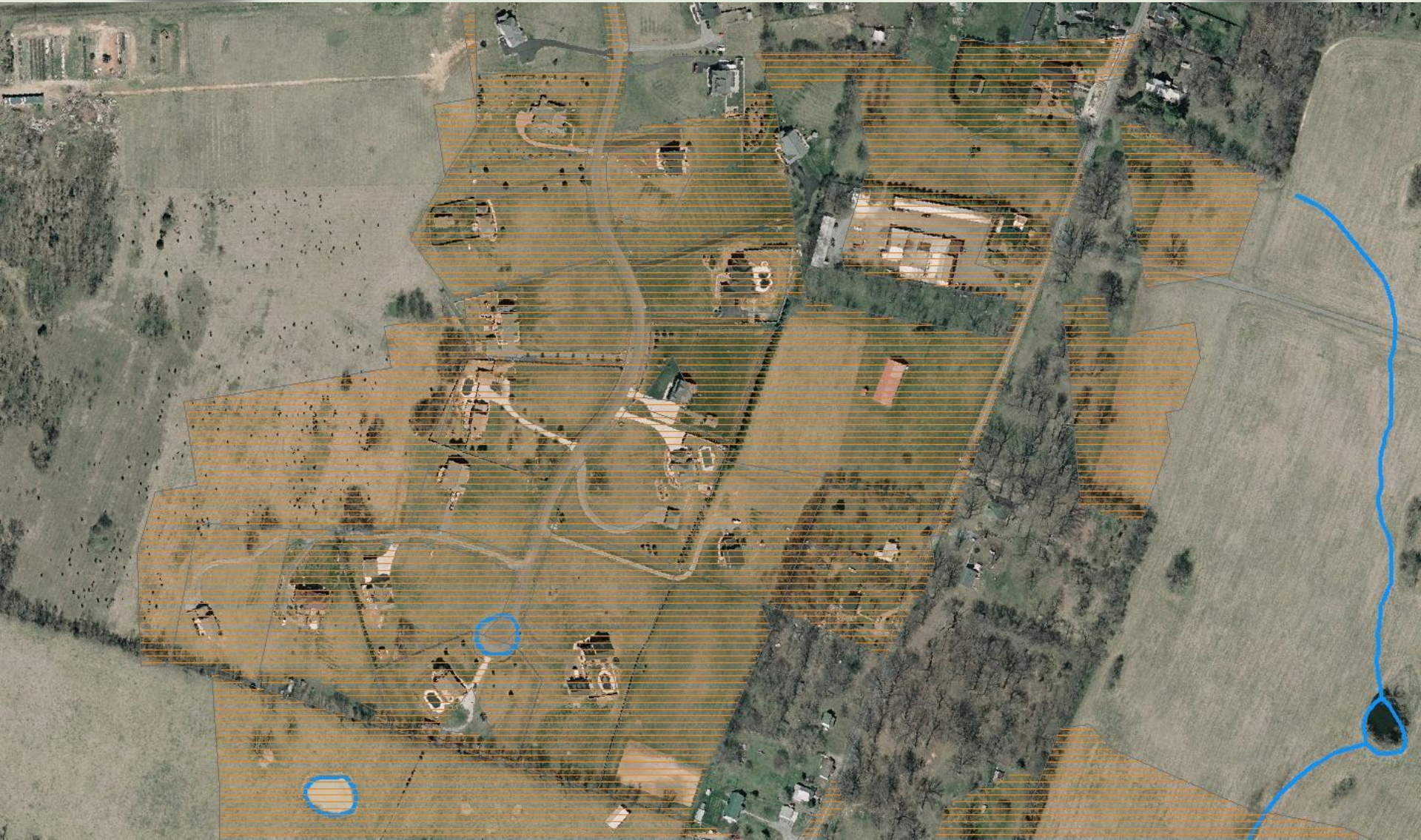


# Top Priority Sites



Jurisdiction	Street Name	No. of Parcels	Nutrient Reduction Score
1. Clarke County (SW)	Vista Lane (off Lord Fairfax Hwy)	19	Portion has high score
2. Clarke County (NE of Town of Berryville)	Along Trapp Hill Rd. between N. Buckmarsh St. and Blakemore Ln.	10	Mostly moderately ranked.
3. Town of Berryville (SW corner)	Dunlap Drive, Craigs Run, Hermitage Blvd	7	Mostly moderately ranked.
Additional lots that are not residential (i.e. open space or large tracks of land behind residential lots, agricultural lands, cemetery, school, and commercial)			





- Field verification of riparian targeting tool for a subset of parcels
- Verify land use for priority parcels, contact landowners
- Re-query parcel layer to identify second tier or priority sites
- Focus discussions with homeowners in priority neighborhoods to identify specific planting areas within the neighborhoods



- Town of Berryville WWTP
- HOA land in Town of Berryville (near Rt. 340)
- Arkfeld property (agricultural)
- To date: 18 acres of new riparian forest buffer on 6,740 linear feet of stream



# Berryville/HOA Site





# Questions?

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