

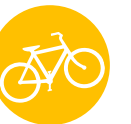
The background is a solid green color with several large, stylized, overlapping leaf shapes in a lighter shade of green. The leaves are arranged in a fan-like pattern, radiating from the bottom left towards the top right.

DEPARTMENT OF THE **ENVIRONMENT**

PRINCE GEORGE'S COUNTY
*UNDERSTANDING THE RELATIONSHIP
BETWEEN LAND USE PRACTICES & CLIMATE
CHANGE*

Presentation of Initial Assessment

July 23, 2021





Central China-July 21



California- June 1



Germany-July 16



Central China-July 21



Netherland- July 17



New York City- July 1

Year 2021
A Summer of Disasters
Around the World

ARE WE NEXT?

Pictures from Washington Post: A summer of floods July 22, 2021

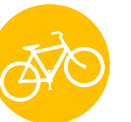
INTRODUCTION:

On May 21, 2021, the Climate Action Commission approved (27) CAC Priority Recommendations as the basis of its Climate Action Plan. The success of the following CAC Priority Recommendations will be directly dependent on our County's ability to both maintain and expand our County's EXSITING TREE and FOREST COVER.

#12-Establish a County no net loss policy. Strengthen Woodland Conservation Act. Create or expand existing incentives for residents and local businesses to plant trees that expand urban tree canopy.

#21- Preserve the flood retention capacity of existing floodplains. Preserve and increase, if possible, the capacity of natural areas to manage additional flooding per future climate projections.

#26- Integrate green infrastructure (GI) projects into County capital improvement budgets, including the prioritization of creating additional publicly accessible open, green spaces with potential for carbon sequestration on County properties. Prioritize nature-based solutions for carbon sequestration, flood prevention, and extreme heat mitigation by adopting and enforcing codes to require green infrastructure (GI) practices for new and existing properties.



PRESERVATION AND EXPANSION OF EXISTING TREE COVER WILL:


MODERATE temperatures through shade/evapotranspiration.

CREATE Community-wide flood resiliency to extreme precipitation events through natural ecosystem services which and increased flood storage.

PROVIDE natural filters for clean air and water

SEQUESTER CARBON to offset greenhouse gases





**Are we recovering what we are losing
by planting trees instead of
preserving trees?**

**Will it be enough to provide our
County with resiliency for climate
change?**

**Is there enough time to allow trees to
grow to provide resiliency to climate
change's extreme storm events?**



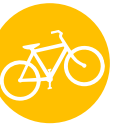
**THE ECONOMIC VALUES OF NATURE:
AN ASSESSMENT OF THE ECOSYSTEM SERVICES
OF FOREST AND TREE CANOPY**
Prince George's County, MD | April 2015



THERE IS ALSO ECONOMIC VALUE OF EXISTING TREE CANOPY

Economic values quantified in 2013, based on 2009 canopy data

- **52%* Canopy Coverage BENEFITS:**
 - **Removes** more than 5,100 metric tons of air pollution worth \$21 million in 2013
 - **Absorbs** 211,000 metric tons of carbon worth \$16.6 million in 2013
 - **Stores** 5 million metric tons of carbon over the lifetime of the forest, valued at \$395 million in 2013
- *University of Vermont data which tracks change over time.



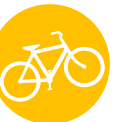
EXISTING RECOMMENDATIONS FROM CURRENT COUNTY PLANNING DOCUMENTS WHICH SUPPORT TREE CANOPY

Plan 2035

- Recommends sustaining the combined forest and tree canopy coverage at 52%
- Recommends targeting land acquisition or ecological restoration activities to stronghold watersheds.

Resource Conservation Plan(Functional Master Plan)

- Track forest and tree canopy coverage countywide
- Place green infrastructure network as the highest priority areas for preservation, restoration, and enhancement of natural resources.
- Focus conservation efforts on preserving existing forests and ensuring sustainable connectivity between forest patches
- Improve overall human health by providing equitable access to connected open and green spaces throughout the County



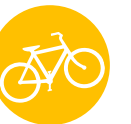
HOWEVER, OUR
COUNTY'S EXISTING
TREE COVER AND
FORESTS ARE UNDER
SIGNIFICANT THREAT
FROM LAND
DISTURBANCE
ACTIVITIES.



PLEASE NOTE: The following slides discuss what appears to be an overall decline of the County's existing tree cover. The data and timelines used for the initial findings are as follows:

Chesapeake Bay Program:

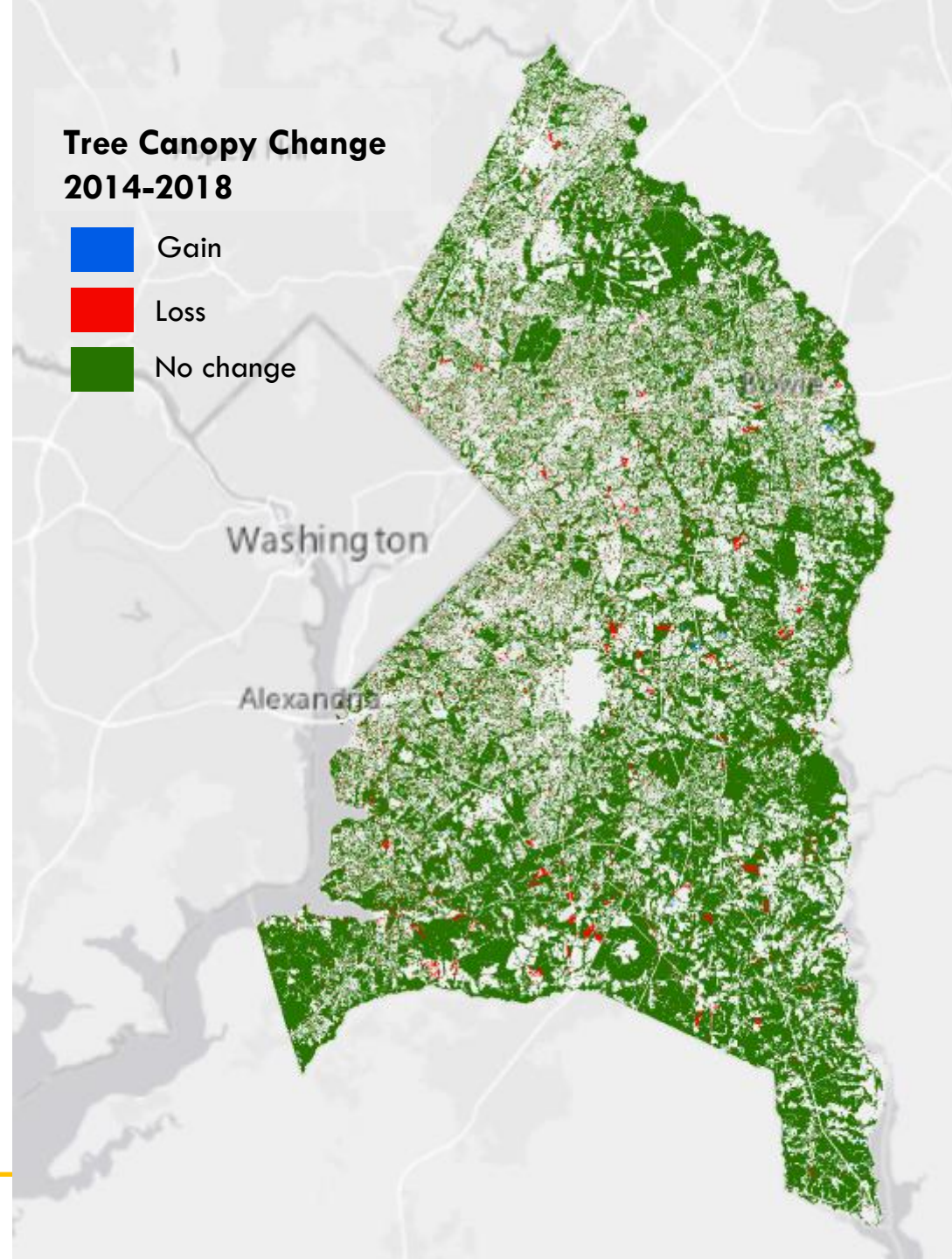
- 1-meter resolution data produced by the Chesapeake Conservancy (CC) and University of Vermont (UVM) for the years 2013/14 to 2017/18.
- Measures tree canopy change during the period 2014-2018.
- 2021/22 is forthcoming in the year 2023.



TREE CANOPY MEASURES

From Plan 2035

- “[Sustain] the County’s combined forest and tree canopy coverage at 52 percent.”
- “Increase tree canopy coverage countywide with a focus on existing communities where forest and tree canopy coverage is sparse.”



TREE CANOPY CHANGE

Tree canopy is **decreasing*** Countywide

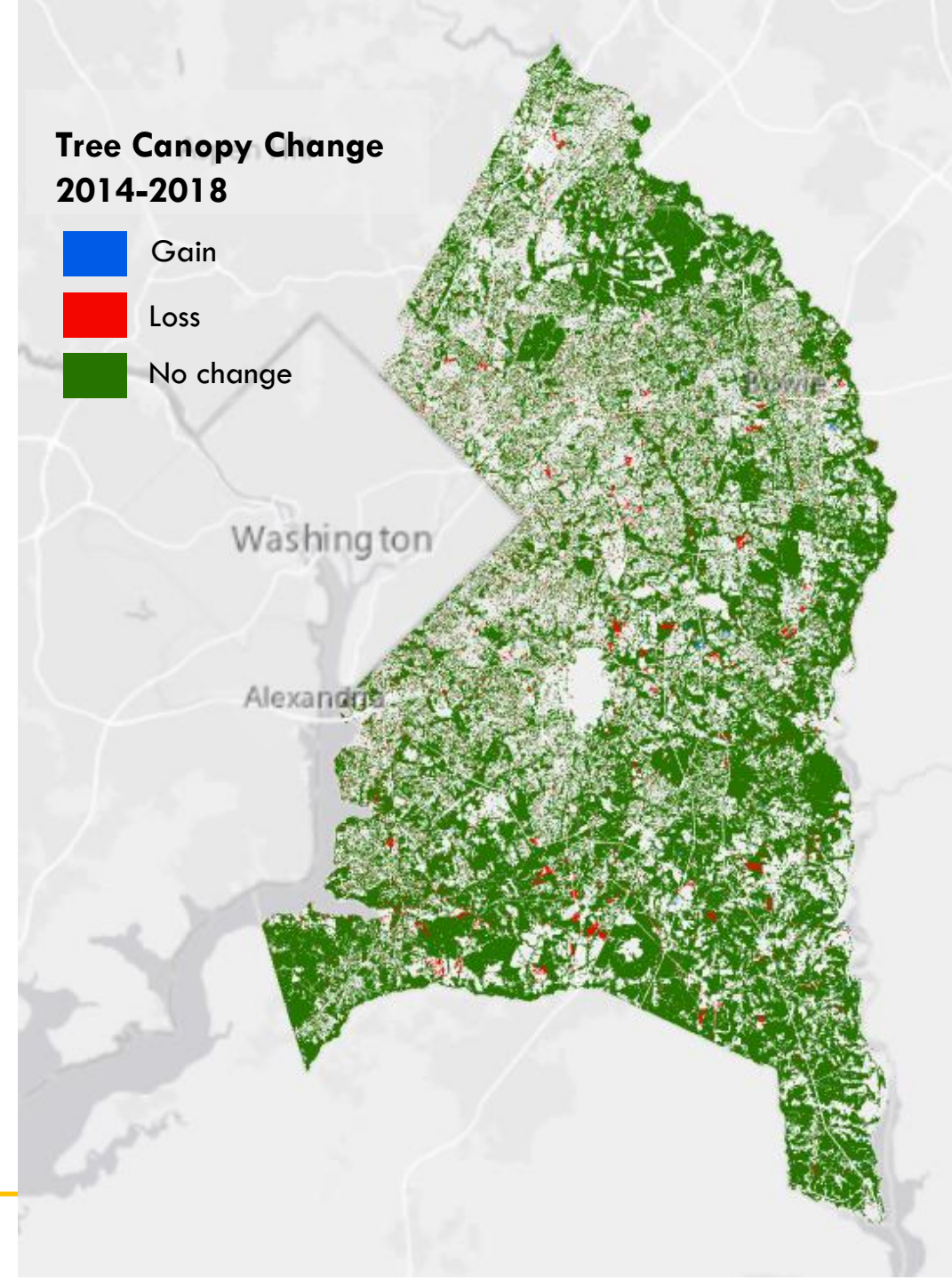
- 53.3% in 2014
- 51.0% in 2018

Tree canopy change includes Countywide gains and losses

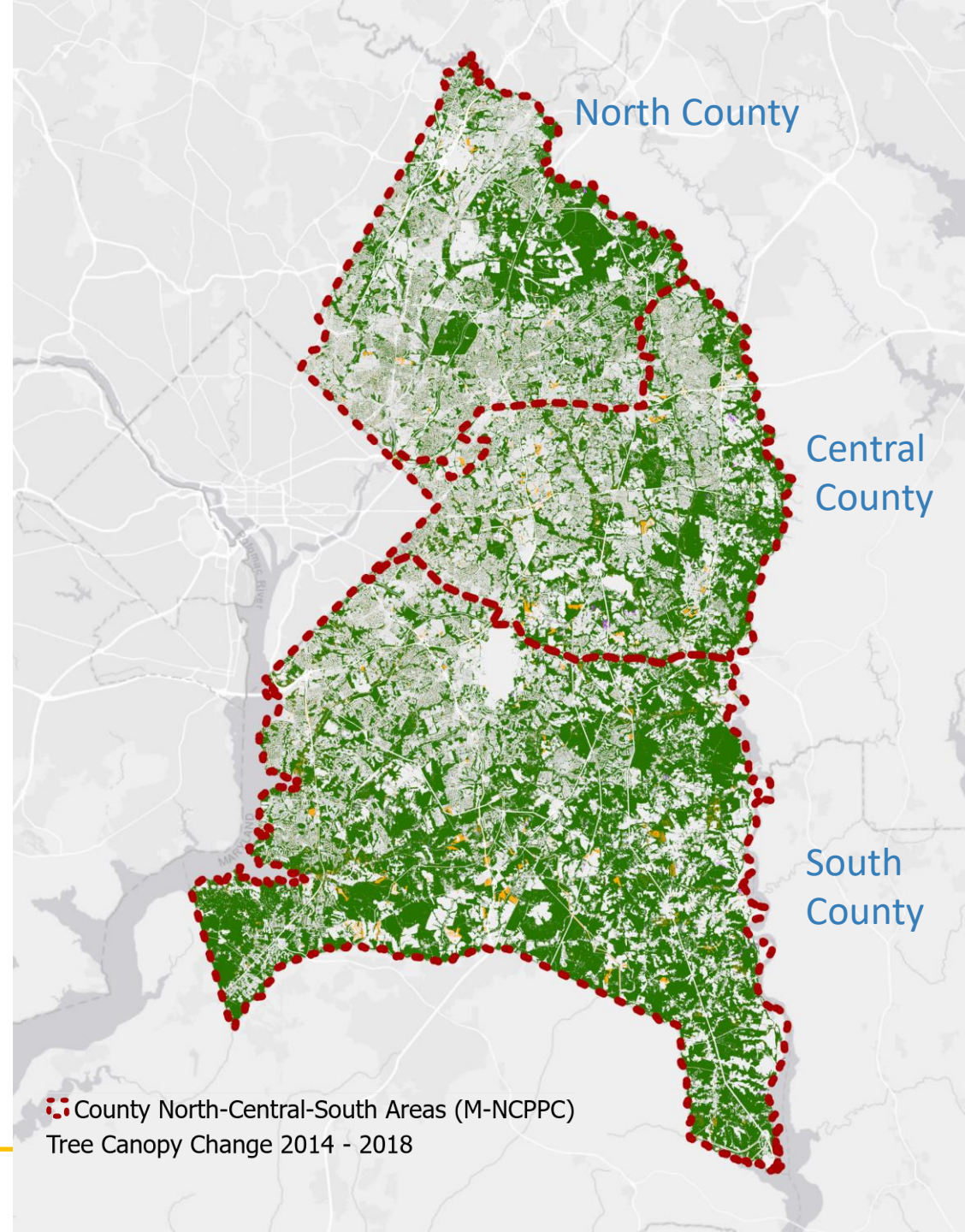
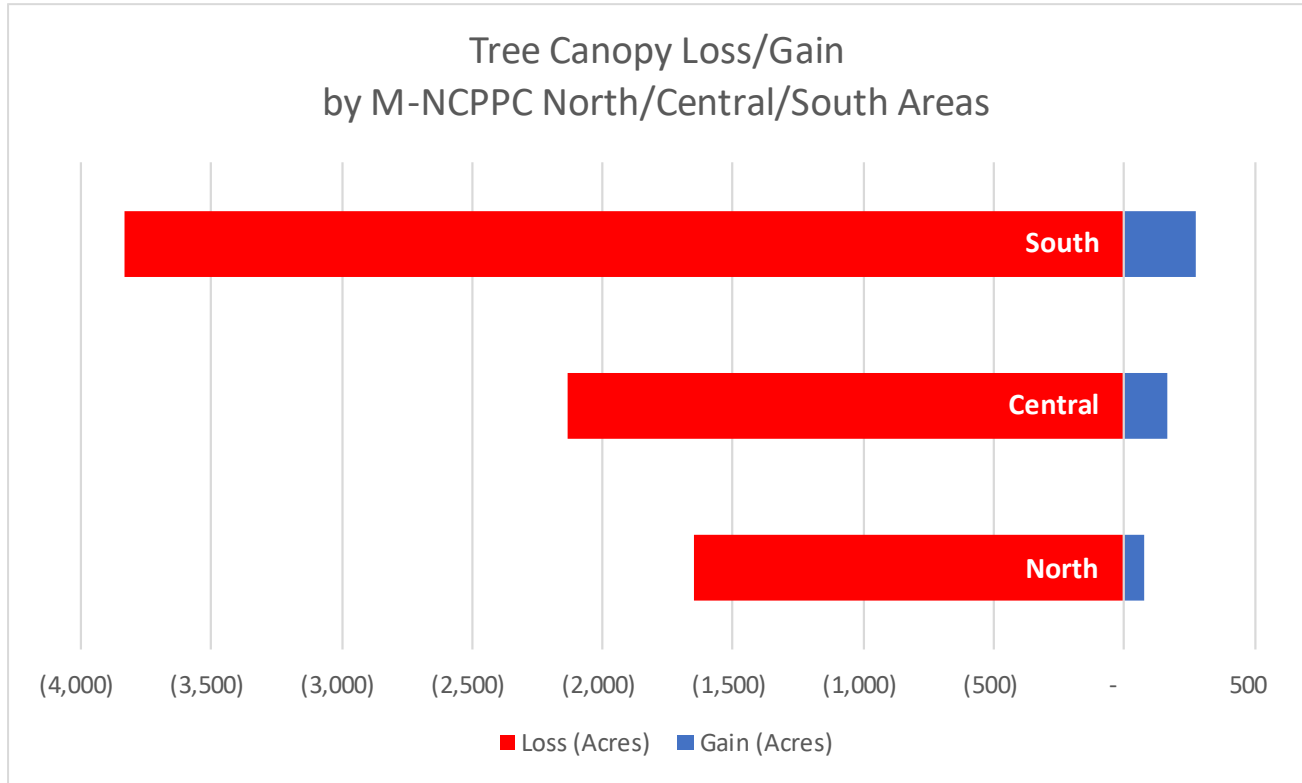
- **Gain:** 514.7 acres
- **Loss:** 7,628.7 acres
- **Net Loss: 7,114 Acres***

Relative decrease in tree canopy between 2014-2018 was 4.3%

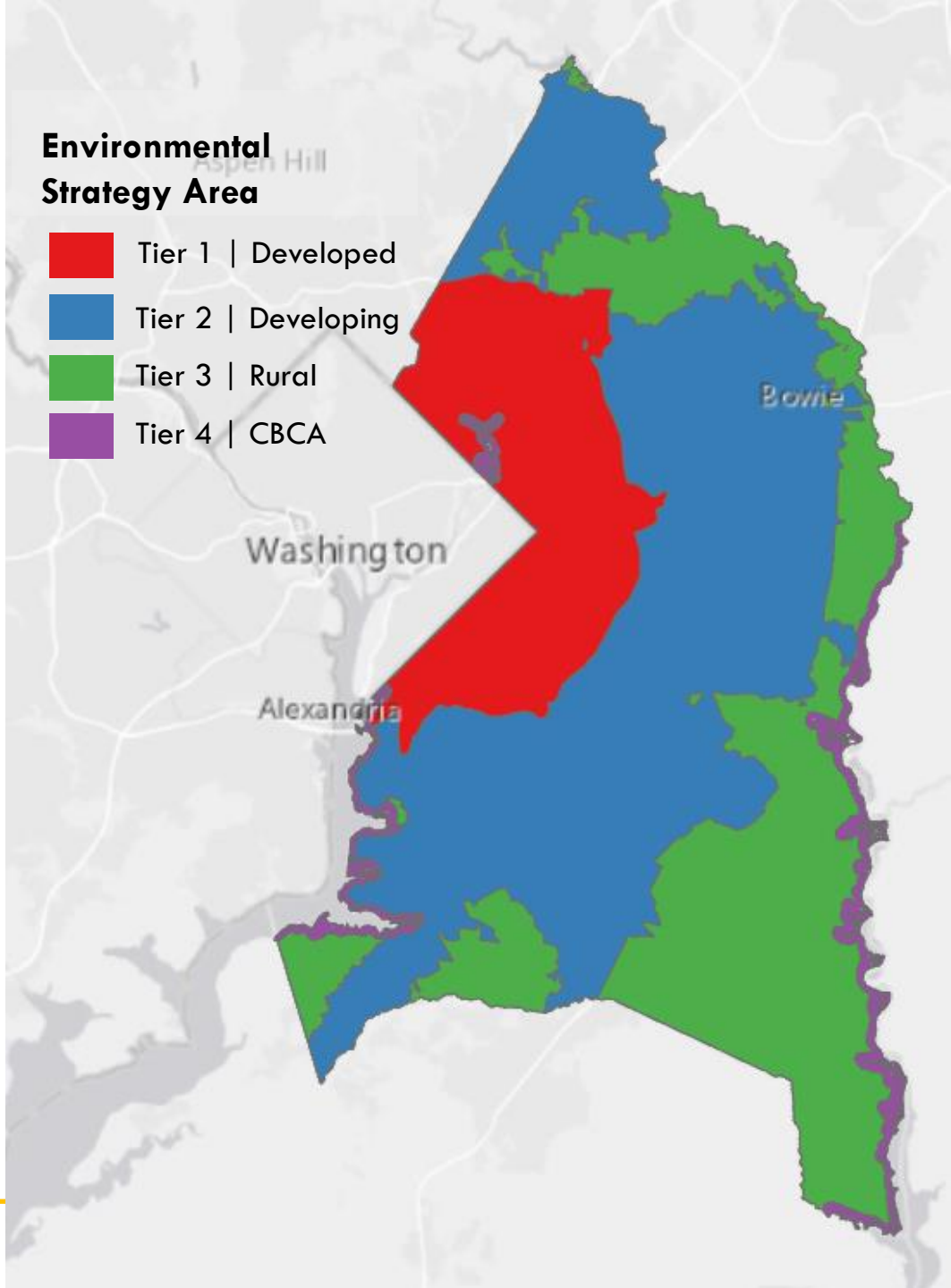
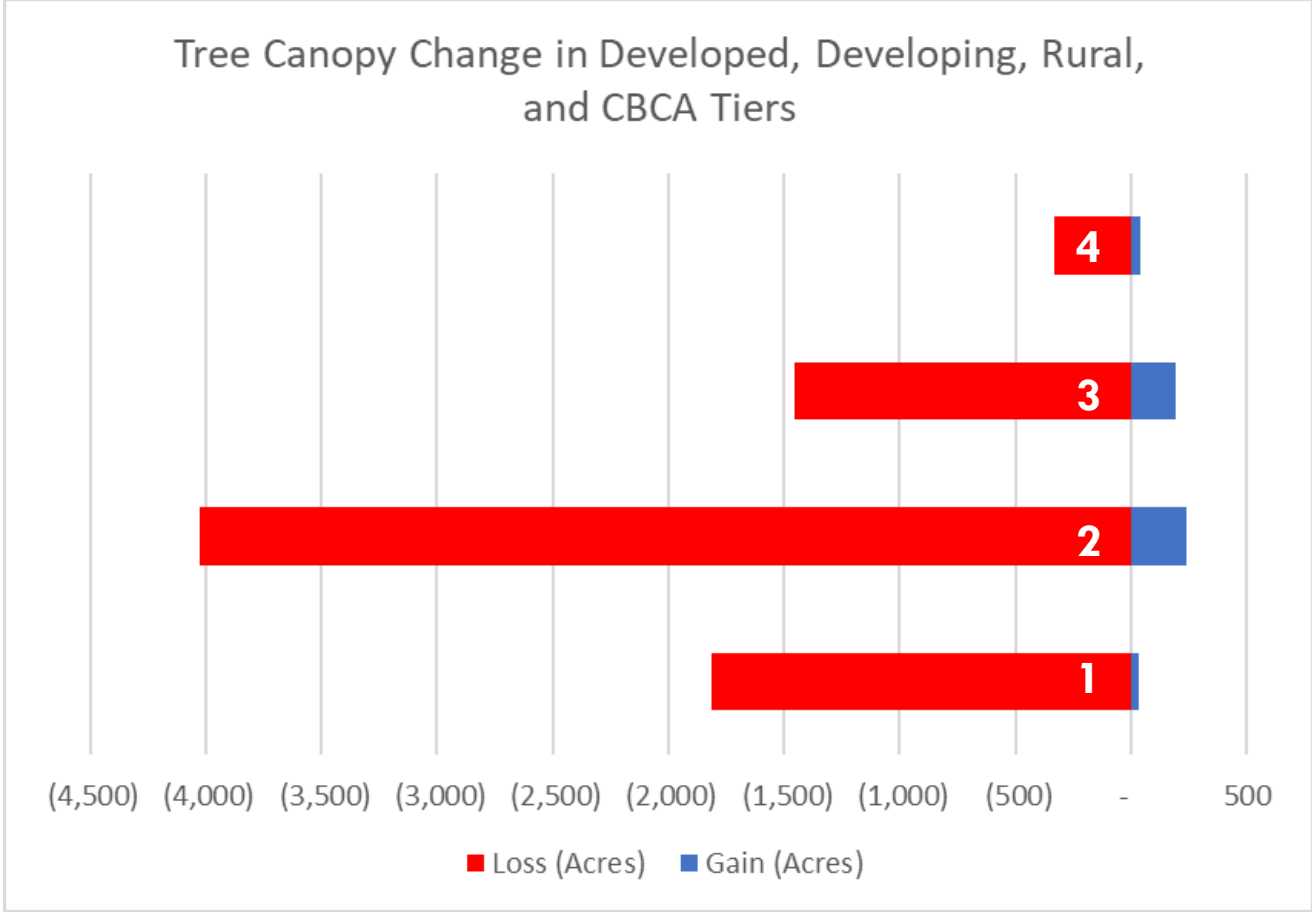
*See Study Methodology Notes-Presentation Appendix.



COUNTYWIDE TREE CANOPY

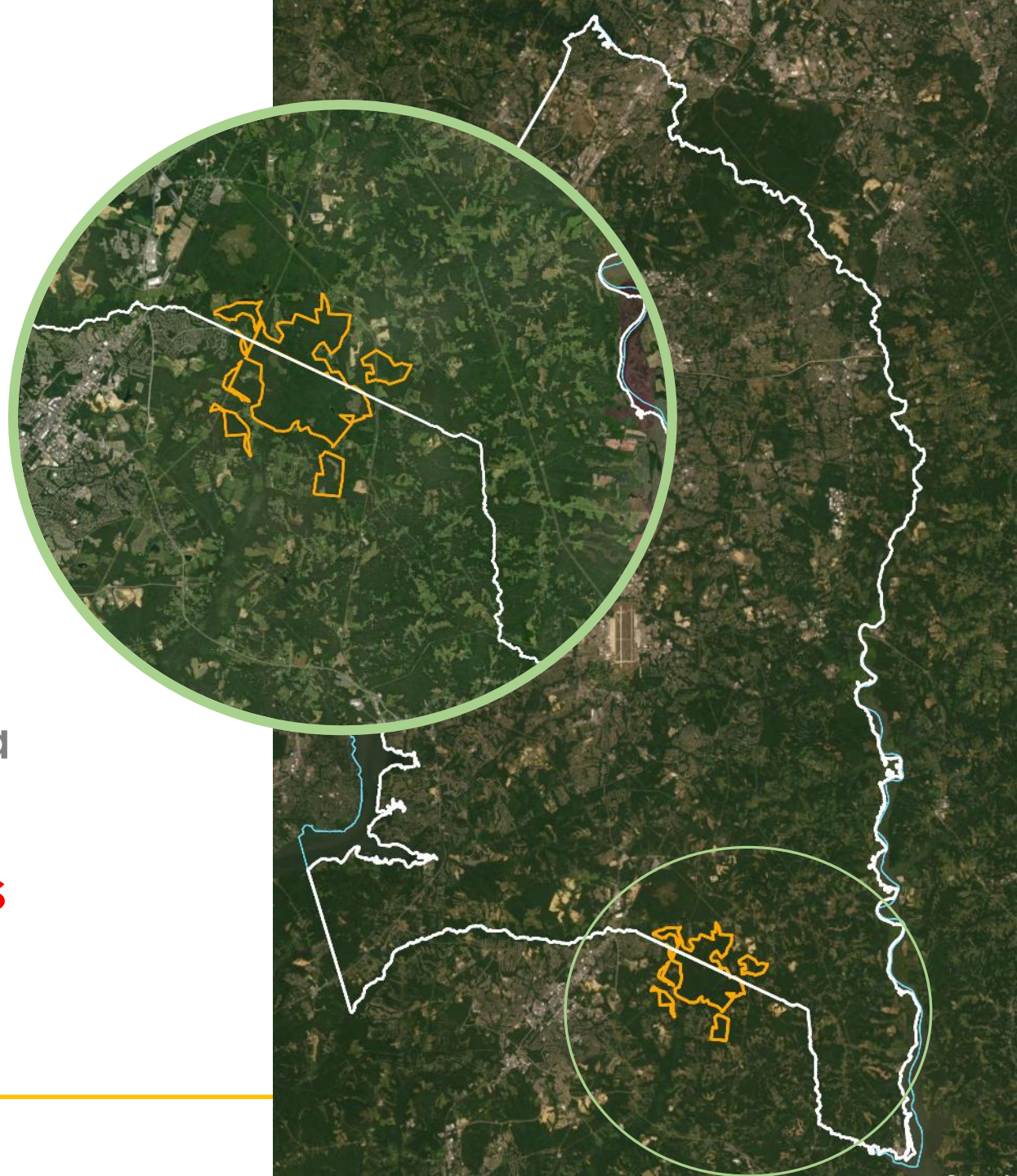


TREE CANOPY BY COUNTY TIERS



HOW MANY CEDARVILLE STATE FORESTS IS THAT?

Cedarville State Forest is an MD DNR-owned forest protection area on the border between Prince George's and Charles County. **It is 5.7 square miles in total size.**



EXAMPLE: LAND DISTURBANCE AND TREE CANOPY CHANGE

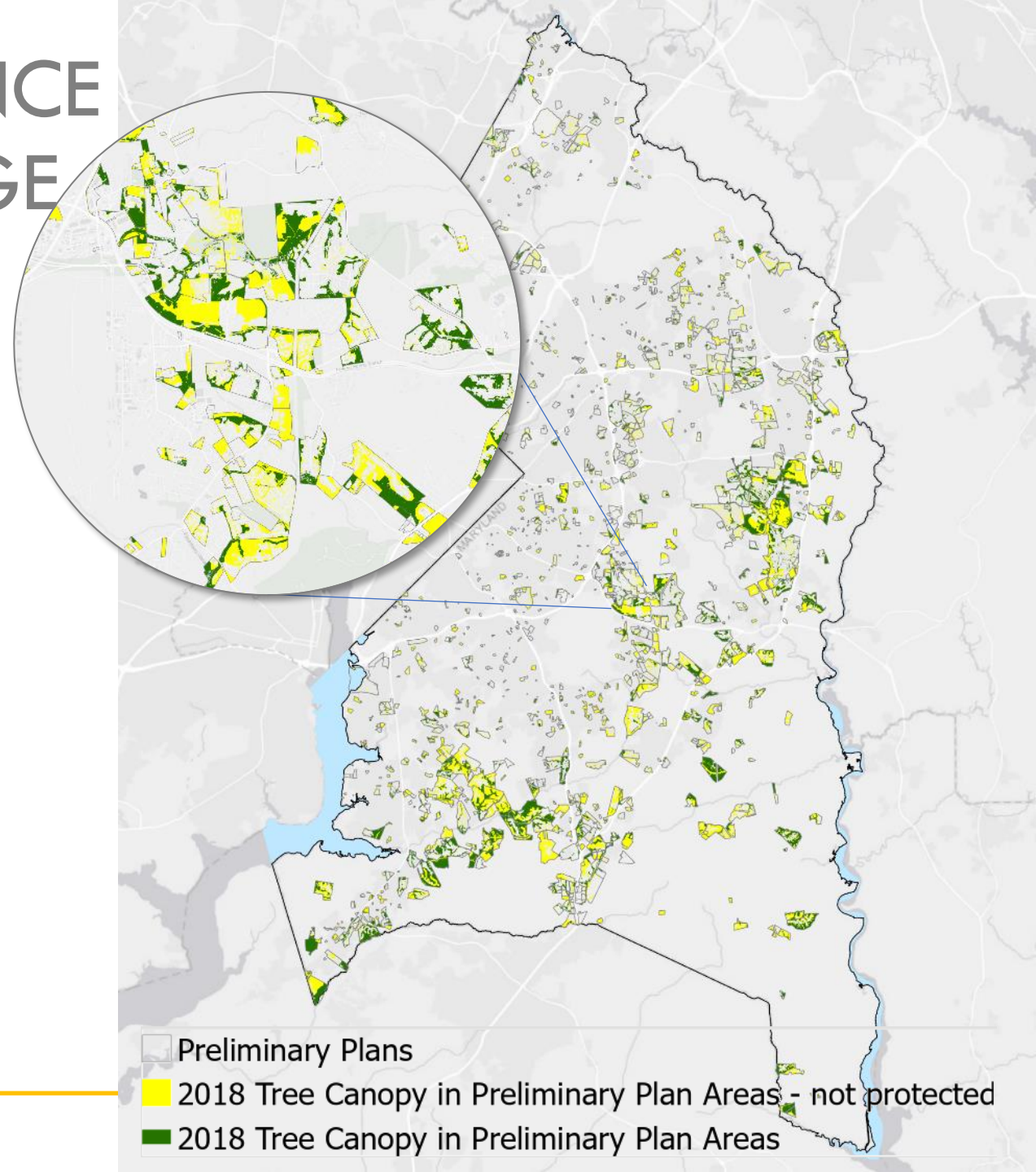
For discussion purposes only – lots of caveats!

Preliminary Plans as recorded 2007 - Present

Total Gross Acreage of Preliminary Plan Area 61,538 Acres

Estimated Tree Canopy in 2018 21,494 Acres

	% total land area	Cedarville State Forest Equivalent
Estimated Tree Canopy (2018)	35%	~6
Estimated Protected via Woodland Conservation	16%	~2.5
Estimated Unprotected	19%	~3.5



- Preliminary Plans
- 2018 Tree Canopy in Preliminary Plan Areas - not protected
- 2018 Tree Canopy in Preliminary Plan Areas

WHAT APPROXIMATE AMOUNT OF PROTECTION DOES THE TREE CANOPY ORDINANCE PROVIDE?

Tree Canopy Requirements by Zone

Zone	Minimum Tree Canopy Coverage
R-O-S, O-S, R-A	Exempt
R-E, R-L, V-L	20%
R-S, R-R, R-80, R-55, R-35, R-20, R-T, R-30, R-30C, R-18, R-18C, R-10, R-10A, R-H, R-U, R-M, R-M-H, V-M	15%
C-A, C-O, C-S-C, C-1, C-C, C-G, C-2, C-W, C-M, C-H, C-R-C, I-1, I-2, I-3, I-4, E-I-A, L-A-C, M-X-C, M-U-I, M-U-T-C, M-X-T, M-A-C, U-L-I	10%

For discussion purposes only – lots of caveats!

Assuming 20% Canopy Required		
	Acres	Cedarville State Forest Equivalent
Total Gross Acreage of Preliminary Plan Area	61,538	~17
Minimum Tree Canopy Required (Gross Acreage x 20%)	12,308	~3.5

***Note:** Tree canopy coverage are required for Building and grading permits that propose 5,000 square feet or greater of gross floor area or disturbance. Coverage requirements are based on the gross tract area. The tree canopy coverage requirements for the redevelopment of a previously developed site that is not exempt are based on the area within the limit of disturbance as shown on any Site Plan. *Waivers, Fee-In-Leu, and Offsite are possible-data on frequency of developments utilizing these options not available.*



WHAT PROTECTION DOES THE WOODLAND & WILDLIFE HABITAT CONSERVATION ORDINANCE PROVIDE?

For discussion

purposes only – lots of caveats!

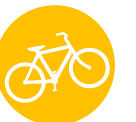
WCO Canopy Requirements by Zone

Zone	Woodland Conservation Threshold	Afforestation Threshold
R-O-S, O-S, R-A	50%	20%
R-E, R-L, V-L	25%	20%
R-S, R-R, R-80, R-55, R-35, R-20, R-T, R-30, R-30C, R-18, R-18C, R-10, R-10A, R-H, R-U, R-M, R-M-H, V-M	20%	15%
C-A, C-O, C-S-C, C-1, C-C, C-G, C-2, C-W, C-M, C-H, C-R-C, I-1, I-2, I-3, I-4, E-I-A, L-A-C, M-X-C, M-U-I, M-U-T-C, M-X-T, M-A-C, U-L-I	15%	15%

Assuming 20% Canopy Required		
	Acres	Cedarville State Forest Equivalent
Total Net Acreage of Preliminary Plan Area	46,314	~13
Minimum Tree Canopy Required (Net Acreage x 20%)	9,262	~2.5

*Note: WCO applies to applications pursuant to Subtitles 4 (Building Code), 24 (Subdivision Ordinance) and 27 (Zoning Ordinance) of the County Code; all activities by a public utility; all activities of a unit of County or municipal government; and all activities delegated to the local jurisdiction by the State.

Coverage requirements are based on the net tract area. *Based on Net Tract Area, requirements can be accomplished through Fee-In-Lieu, and/or Banks, Offsite without on-site tree preservation.*



THEN



Year 2000

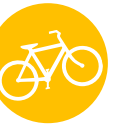
M-NCRPC, VITA, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, M-NCRPC

Vs. NOW



Year 2020

M-NCRPC, VITA, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, M-NCRPC





WHAT COULD
OUR COUNTY BE
LIKE WITH EVEN
MORE TREES?



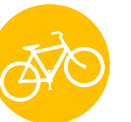
GREEN INFRASTRUCTURE NETWORK

Plan 2035

- Place green infrastructure network as the highest priority areas for preservation, restoration, and enhancement of natural resources.

Our **STUDY** Question:

“How much tree canopy has been gained/lost in the green infrastructure network’s regulated area between 2014 – 2018?”



CANOPY CHANGE IN GREEN INFRASTRUCTURE NETWORK REGULATED AREAS

Tree canopy is decreasing

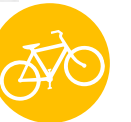
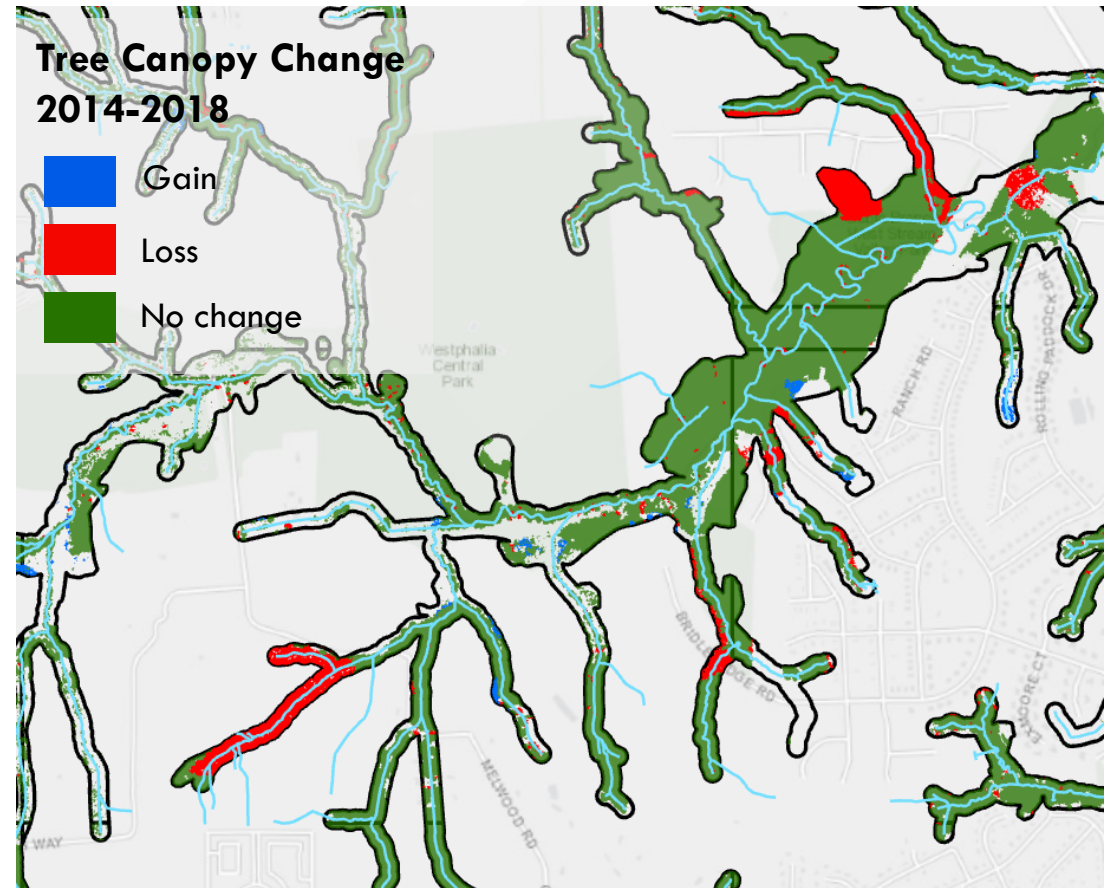
- 74.1% in 2014
- 71.9% in 2018

Tree canopy gains and losses

- Gain: 142.5 acres
- Loss: 2,052.1 acres
- **Net Loss: 1,909.6 acres (3 Square Miles)**

Relative decrease between 2014-2018 was 3.0%

No assessment on impact to connectivity



Example of Green Infrastructure within Preliminary Plan Areas



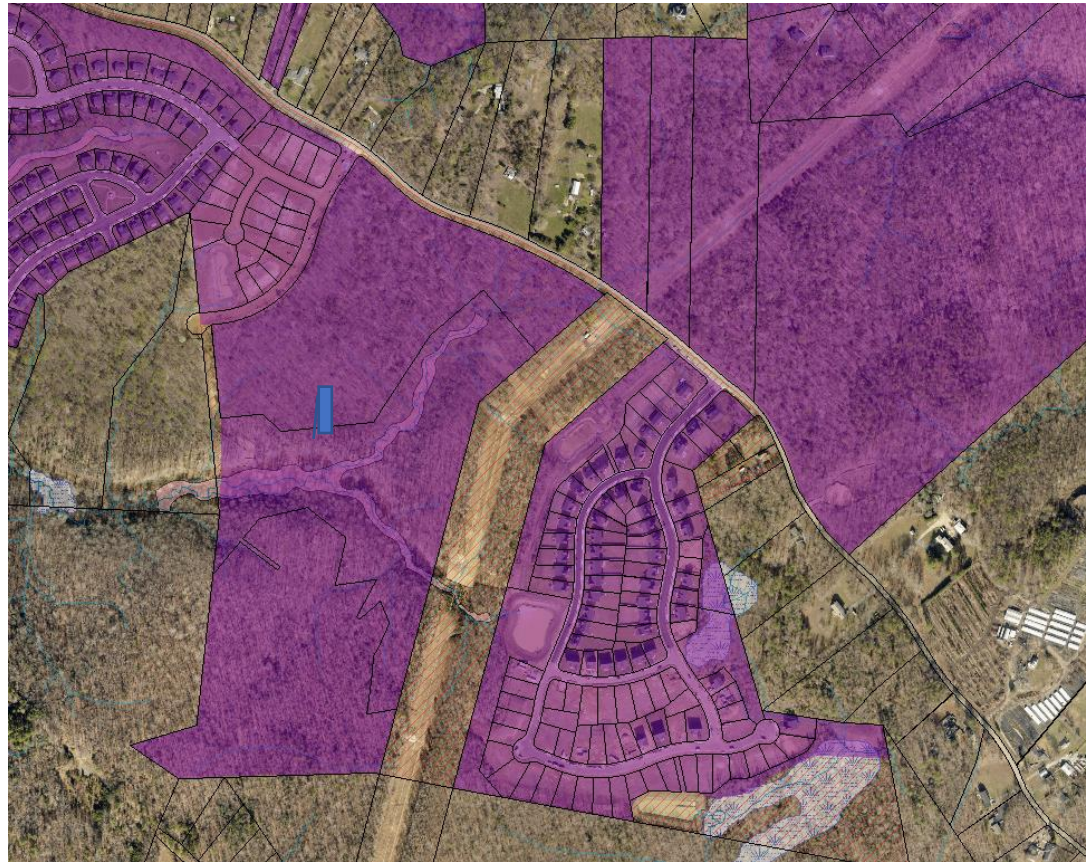
Under Preliminary Plan

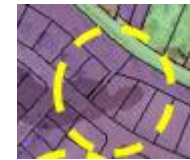


Green Infrastructure(Unregulated)



Green Infrastructure(Regulated)





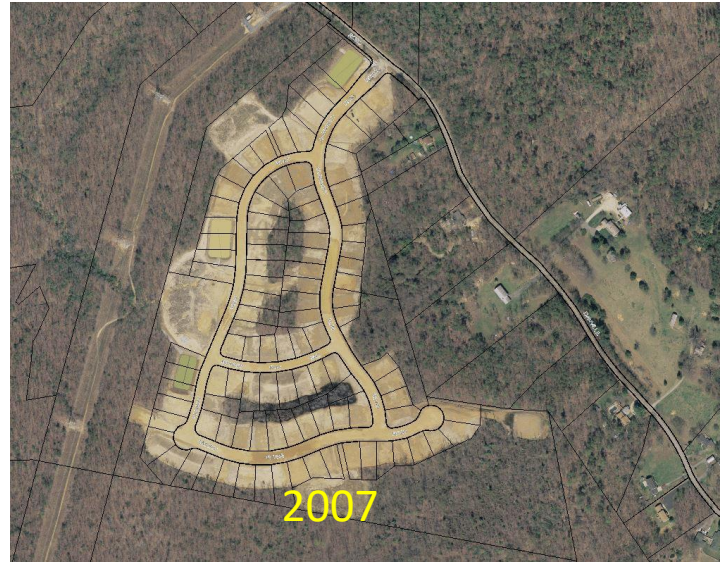
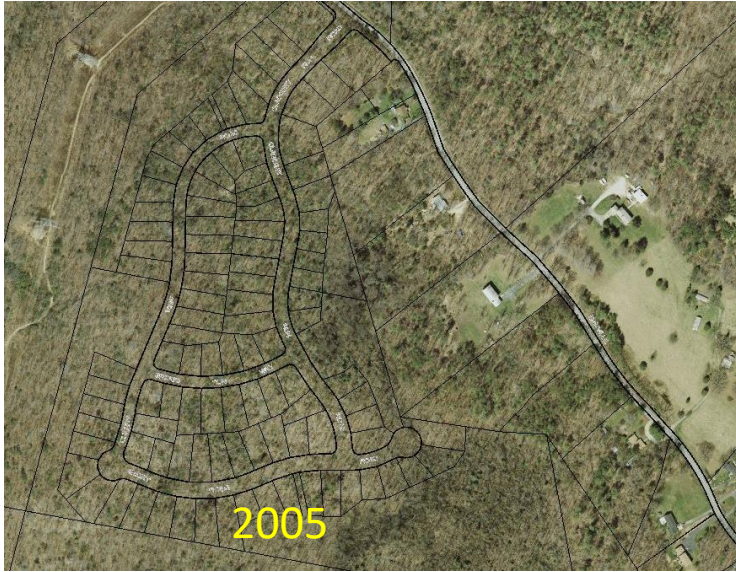
Locations where both stream, buffer, and trees were lost in the Regulated Areas of the Green Infrastructure



Area in 2005-Total Forest Cover



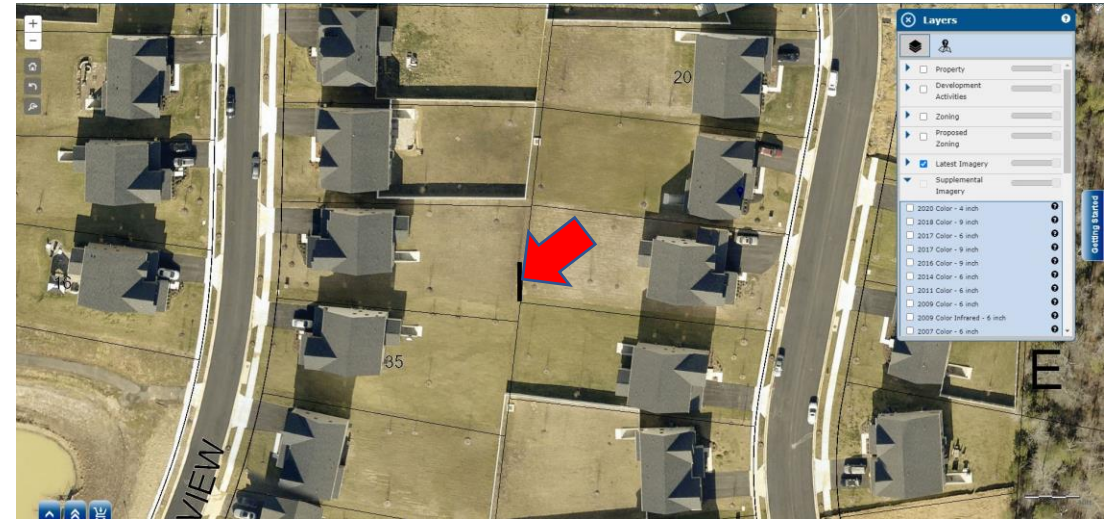
EXAMPLE OF LAND DISTURBANCE OVER 16 YEARS



FOREST REGENERATION WAS REMOVED



2016



2020





2005 Tree Canopy Before Rough Grading



2016 Tree Canopy Regeneration(Oppportunity)

Plan Key

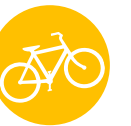
● Trees planted post development For Tree Canopy

➡ Same Location over time



2020 Installed Tree Canopy

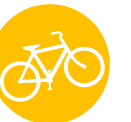
Zone R-L(1.0-1.5)
25% Conservation
20% Tree Cover



TREE CANOPY CHANGE DATA

Chesapeake Bay Program

- 1-meter resolution data produced by the Chesapeake Conservancy (CC) and University of Vermont (UVM) for the years 2013/14 to 2017/18.
- Measures tree canopy change during the period 2014-2018.
- 2021/22 is forthcoming in the year 2023.



COUNCIL OF GOVERNMENTS EQUITY EMPHASIS AREAS

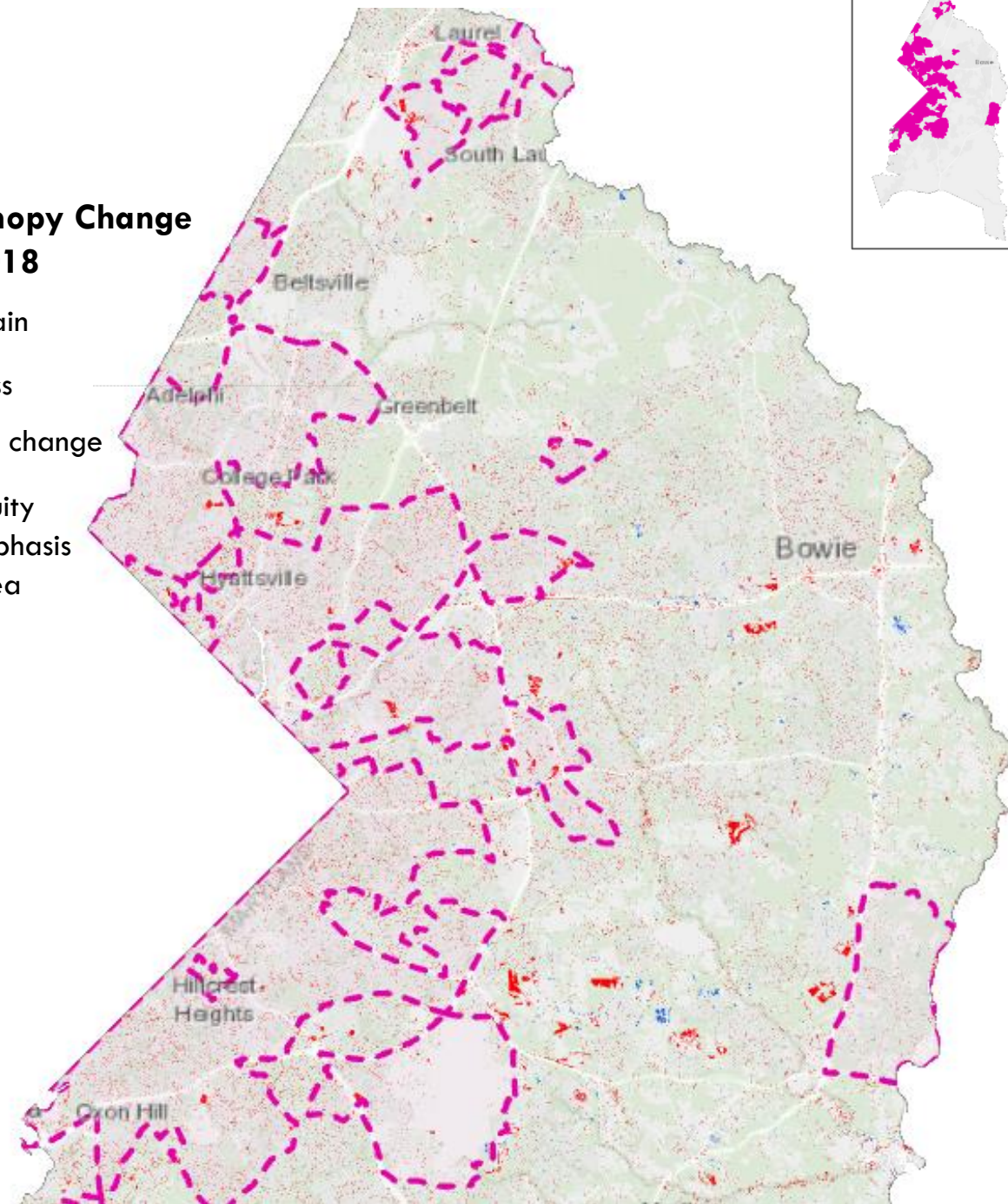
	Equity Emphasis Area	Rest of County
Total Gain (Acres)	42.7	472.1
Total Loss (Acres)	1,710.4	5,918.3
No Change (Acres)	20,019.9	137,866.3
Net Loss (Acres)	1,667.7	5,446.8

	Equity Emphasis Area	Rest of County
Percent Tree Canopy in Year 2014*	38.8%	56.5%
Percent Tree Canopy in Year 2018*	35.8%	54.4%

*As a percentage of land cover

Tree Canopy Change 2014-2018

- Gain
- Loss
- No change
- Equity
Emphasis
Area

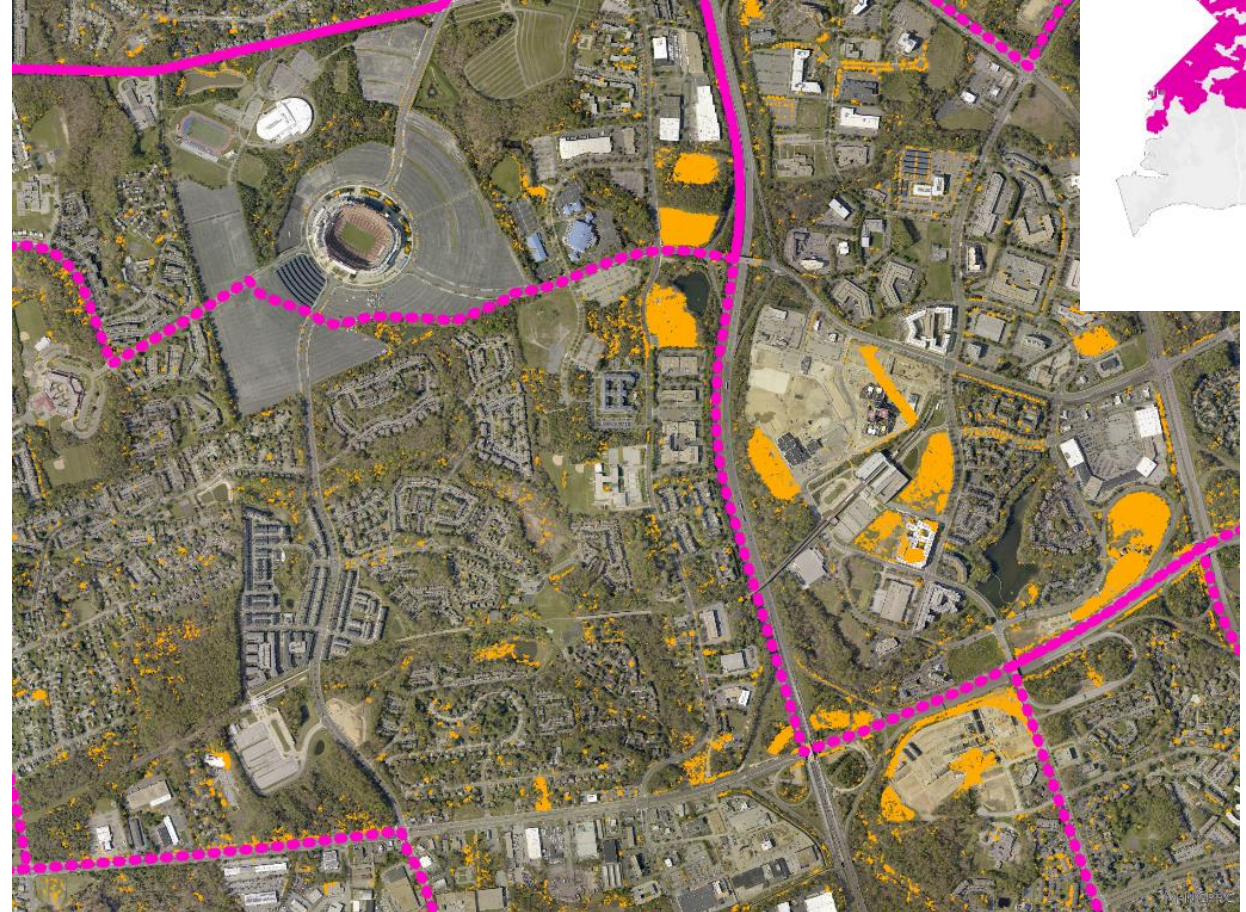


COUNCIL OF GOVERNMENTS EQUITY EMPHASIS AREAS

Equity Emphasis Areas tend to be highly developed with a high proportion of impervious surfaces.



**Tree LOSS in an Equity
Emphasis AREA**

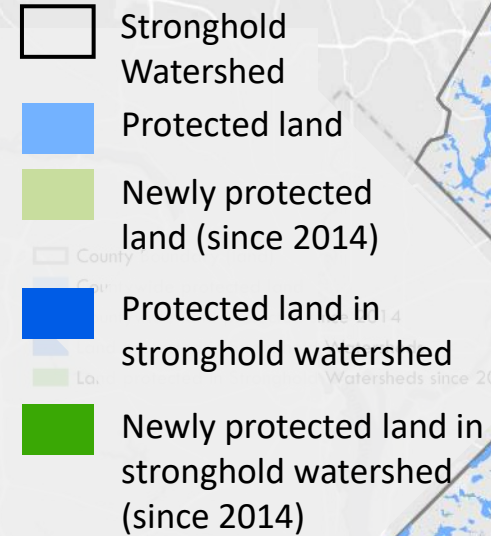


STRONGHOLD WATERSHEDS-IDENTIFIED BY STATE OF MARYLAND AS IMPORTANT TO PROTECT

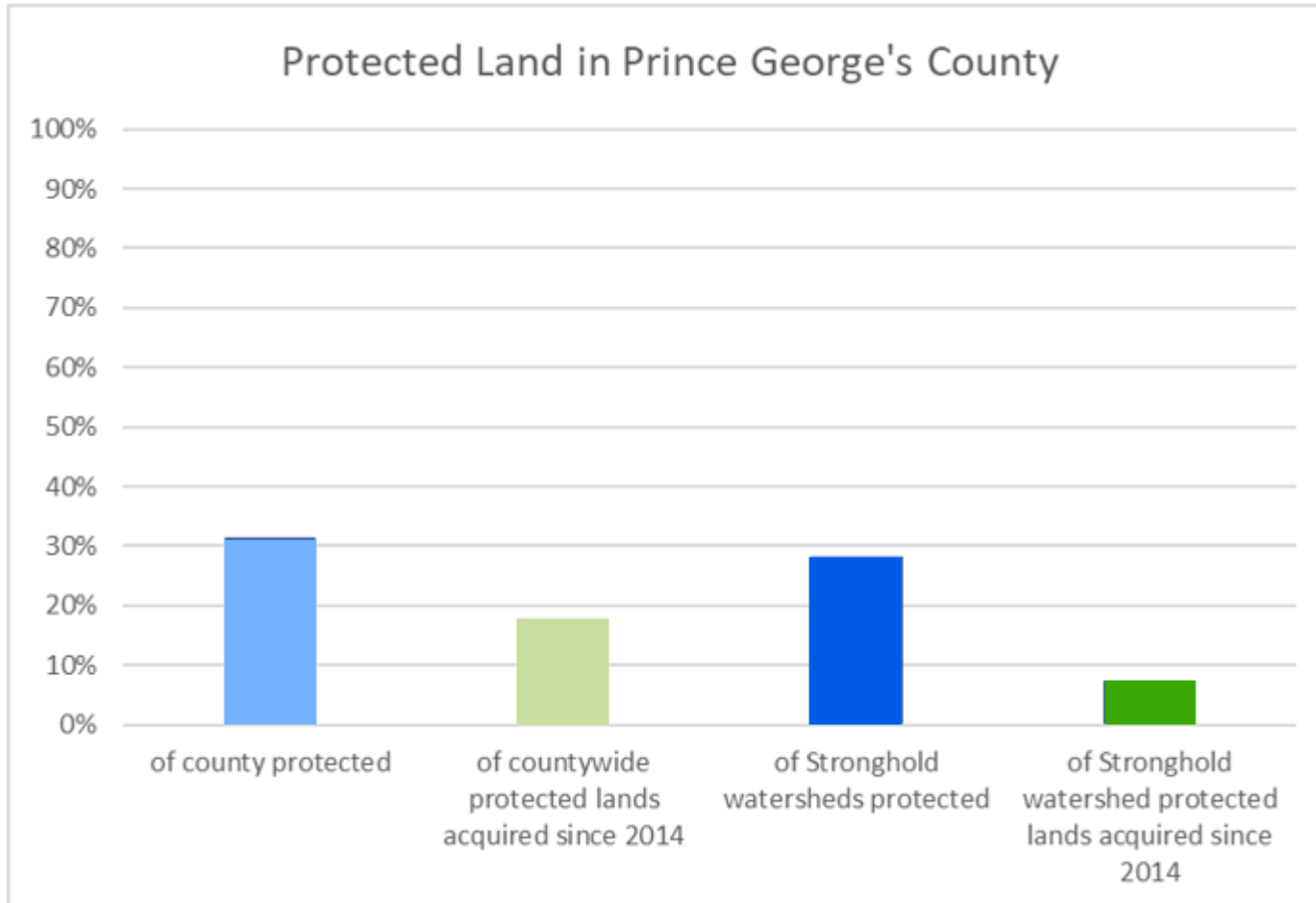
Plan 2035

- Target land acquisition or ecological restoration activities to stronghold watersheds (NE 2.3).

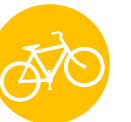
Land Acquisition in Stronghold Watersheds



WHERE HAS LAND ACQUISITION OCCURRED?



- Not much difference between percent of land protected with Stronghold watersheds vs. without overall.
- No indication that land protection efforts have been targeted to stronghold watersheds since Plan 2035 was put in place in 2014.



QUESTIONS FOR DISCUSSION:

- How can land use policy support climate resiliency?
- Is it possible to accomplish our Carbon Sequestration goals without amending our current land disturbance practices?
- Policy vs. Practice, what are the carbon footprint benefits of preservation of existing tree canopy vs. new tree plantings?
- Why are existing forested properties targeted for development vs. infill development?
- How does a no NET Loss tree Policy fit into this discussion?
- How do we balance incentivizing transit- oriented activity centers(denser growth) with without compromising fragile urban tree canopy and forest?





CONTACT US

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1801 McCormick Drive, Suite 500
Largo, Maryland
(301) 883-5810



APPENDIX-DATA SOURCE EXPLANATION

The CBP data was selected to evaluate tree canopy change because it was specifically designed for monitoring change. The University of Vermont and developed a land cover change classification directly from spectral change over two dates in addition to developing a 2017/18 land cover dataset to monitor change, versus evaluating change using two independently-produced datasets. In addition, while the threshold for the M-NCPPC appears to have been set to 40 square feet, which equates to roughly 3.7 square meters, the CBP data was set to measure change down to 1 square meter (~10.8 square feet), allowing for smaller trees to be picked up by the analysis.

Prince George's County Department of the Environment Draft Methodology for Countywide Canopy Change July 22, 2021

Description: This indicator utilizes the Chesapeake Conservancy's Change in Tree Canopy 2014-2018 and its 2018 Land Cover dataset to determine the total acreage of tree that was canopy gained or lost, or where no change was observed for the specified time period. The Change in Tree Canopy 2014-2018 data includes four change scenarios:

- Gain (areas where tree canopy was gained from 2014-2018)
- Loss (areas where tree canopy was lost from 2014-2018)
- Tree Canopy (areas where there was no change in tree canopy from 2014-2019)
- No Tree Canopy (areas where no tree canopy existed at either time period). The "water" category from the Chesapeake Conservancy's 2018 Land Cover data was utilized to exclude water from CBP tree canopy change layer to account for inability for trees to be grow in water.

Both of the Chesapeake Conservancy's datasets were converted from raster to polygon features to simplify the analysis. Area calculations were prepared for change scenarios using the following geographic breakdowns: Countywide; North/Central/South; Environmental Strategy Areas; and MWCOG's Equity Emphasis Areas (2012-2016).

About the Chesapeake Conservancy Data: Under a 6-year Cooperative Agreement with the Chesapeake Bay Program, the Chesapeake Conservancy (CC) and University of Vermont (UVM) are producing 1- meter resolution land cover datasets for the years 2013/14, 2017/18, 2021/22 using the best available Light Detection and Ranging (LiDAR) and National Agriculture Imagery Program (NAIP) aerial imagery for the Chesapeake Bay watershed (including Prince George's County).

Information for 2013/14 is complete. Information for 2017/18 is still considered draft. The data is currently in it's Version1 form. A Version 2 of this dataset will be available in December 2021

