Maryland Tree Canopy Change: Preliminary Results

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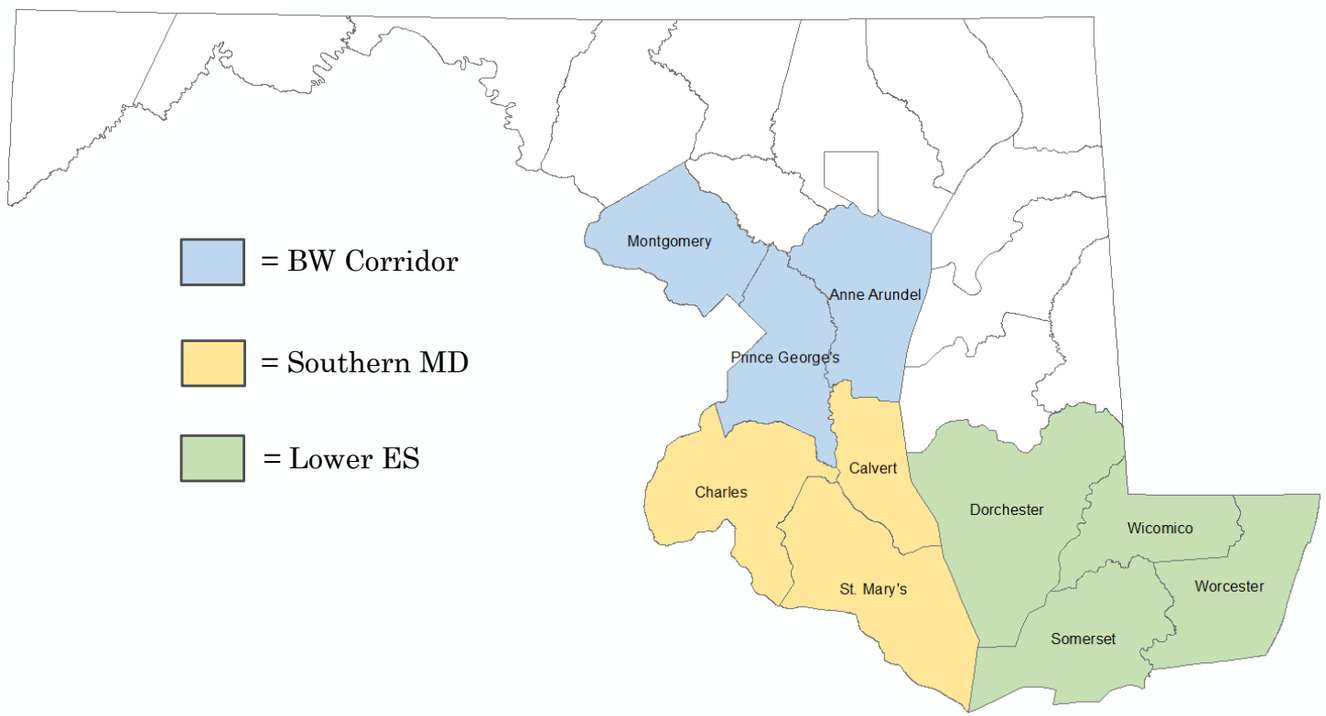
The Data

- Tree canopy gain and loss data from 2013/2014 – 2017/2018
- Derived from 1x1 meter land cover data from Chesapeake Conservancy
- Baltimore Washington Corridor
  - Anne Arundel
  - Montgomery
  - Prince George's
- Southern Maryland
  - Calvert
  - Charles
  - St. Mary's
- Lower Shore
  - Dorchester
  - Somerset
  - Wicomico
  - Worcester



Goals of Project

- Where is the loss happening?
- What are the drivers for loss?
- How do the patterns of loss differ between counties/regions?
- How much of the loss is permanent?

Summary of Loss

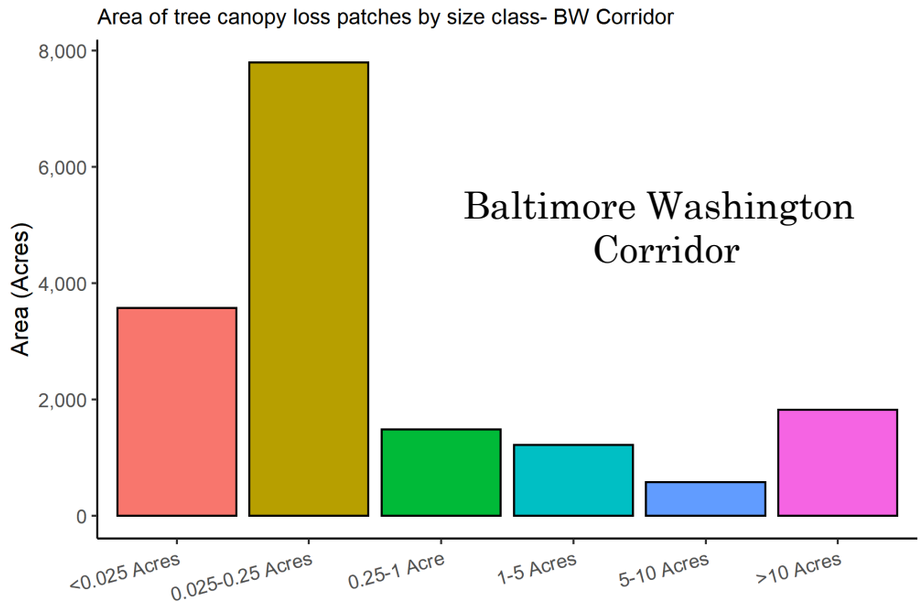
County	Tree Canopy Gain (acres)				Tree Canopy Loss (acres)			
	Total	In Urban Areas	In 100ft Stream Buffers	In Critical Areas	Total	In Urban Areas	In 100ft Stream Buffers	In Critical Areas
Anne Arundel	188.24	91.01	5.33	78.68	2,543.78	1,860.08	83.04	425.51
Montgomery	656.14	395.08	52.06	-	6,364.05	4,807.08	666.69	-
Prince George's	518.15	235.95	23.42	44.38	7,567.04	5,397.82	649.29	334.24
Calvert	899.24	267.05	24.29	117.67	1,566.72	643.00	28.28	134.22
Charles	1,478.35	197.91	69.31	65.89	2,529.30	634.85	66.38	87.19
St. Mary's	1,524.98	249.39	75.11	266.67	1,897.06	318.22	42.82	208.71
Dorchester	2,111.68	33.65	151.91	517.18	1,730.68	26.35	68.92	429.74
Somerset	4,778.99	43.09	123.04	626.04	1,258.22	17.18	44.45	123.11
Wicomico	3,703.89	481.81	157.95	206.13	2,337.47	288.33	76.60	181.30
Worchester	6,900.44	36.71	587.63	350.19	3,514.53	119.08	226.46	193.86
TOTAL	**22,760.11**	**2,031.66**	**1,270.03**	**2,272.83**	**31,308.86**	**14,111.98**	**1,952.93**	**2,117.86**

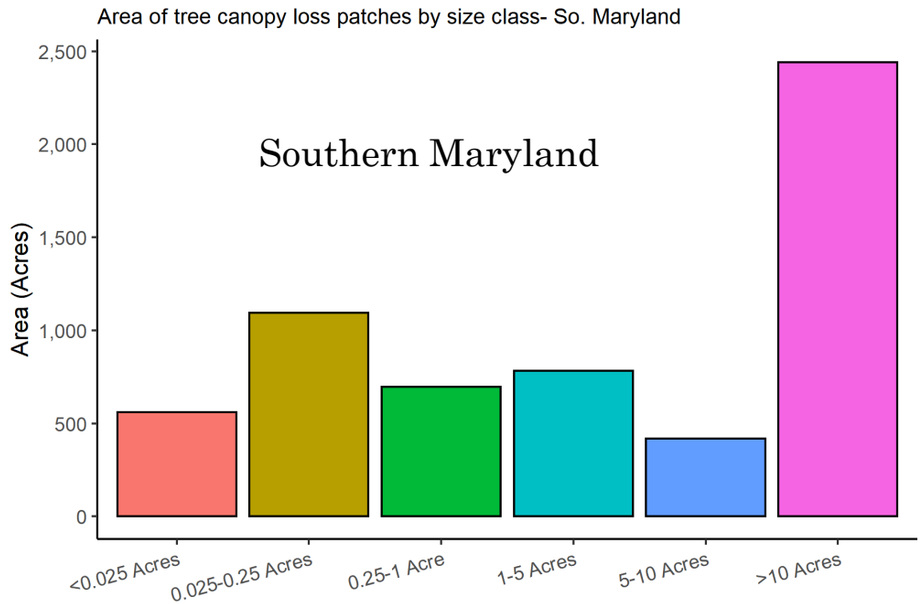
= BW Corridor

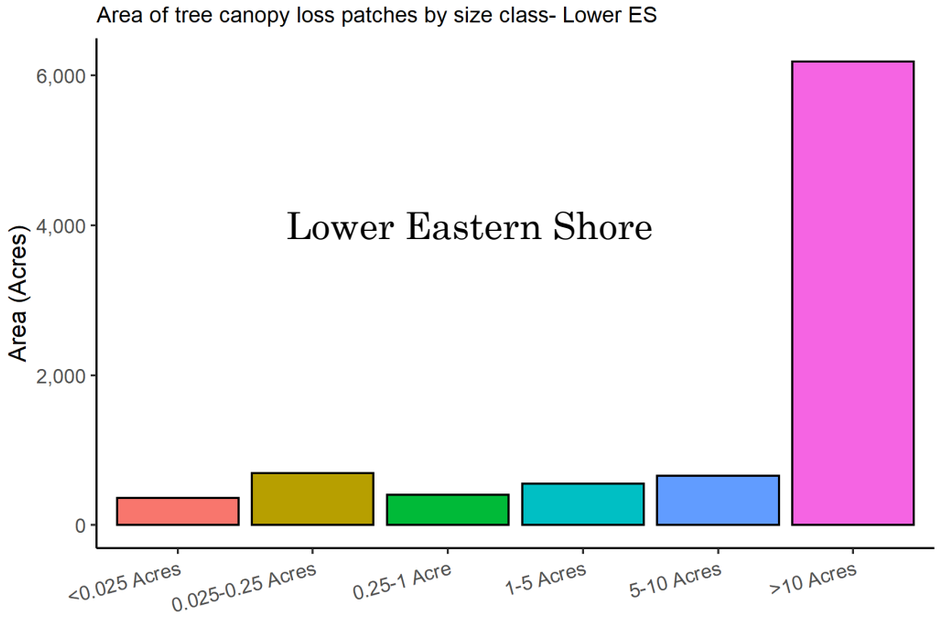
= Southern MD

= Lower ES

Summary of Loss

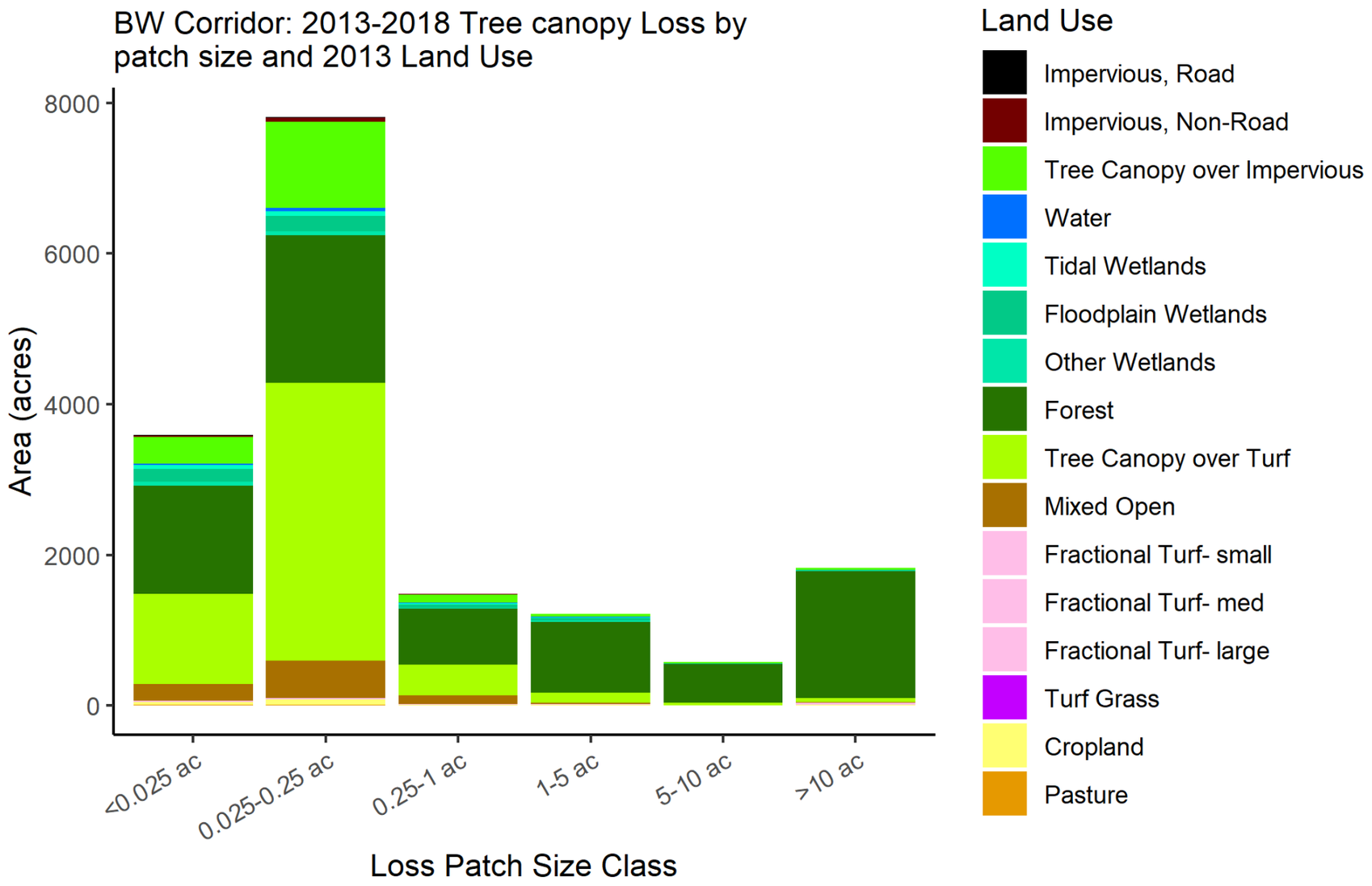






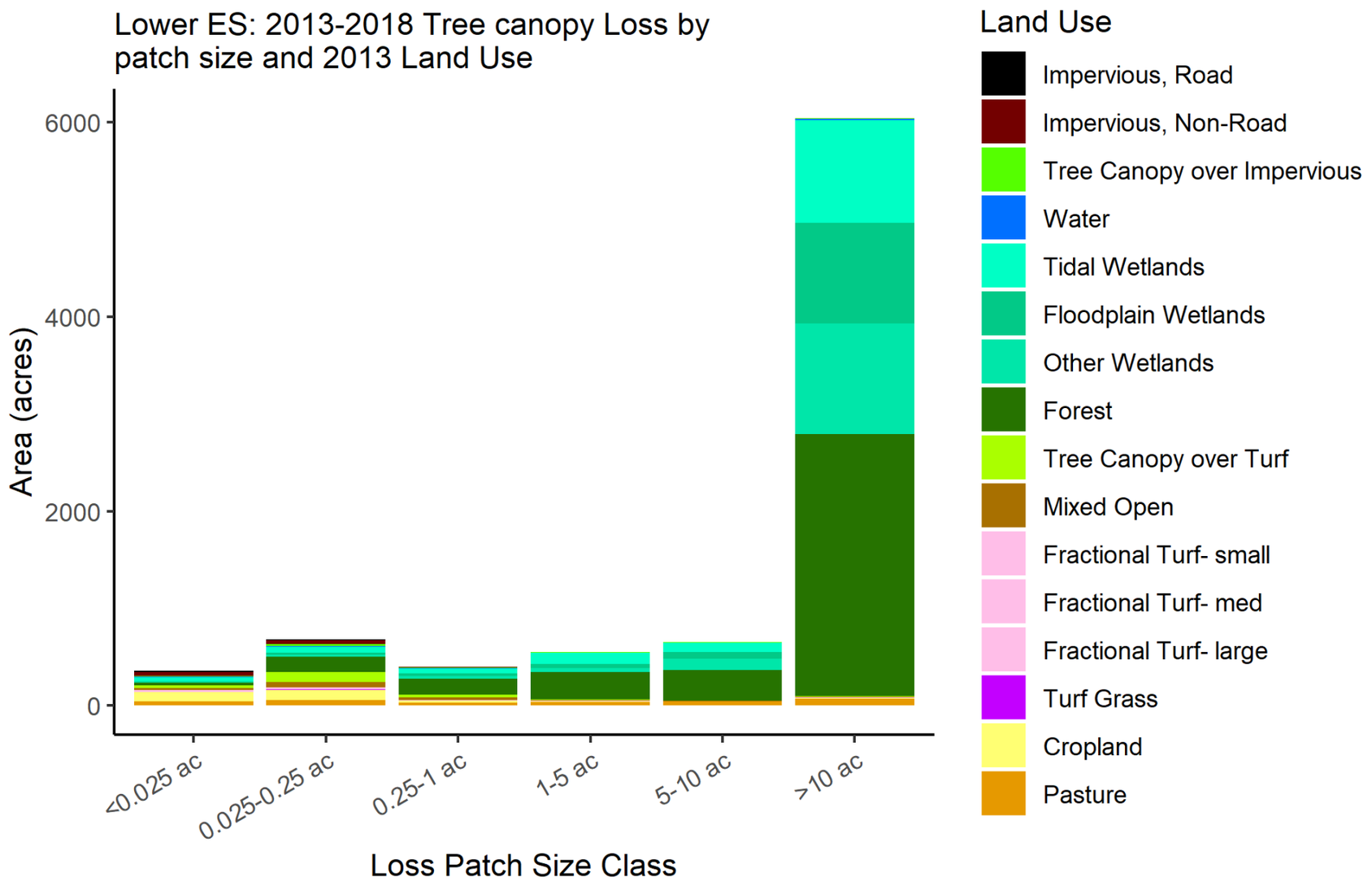
*Note different y-axis scales on these graphs

2013 Land Use on Areas of TC Loss - BW

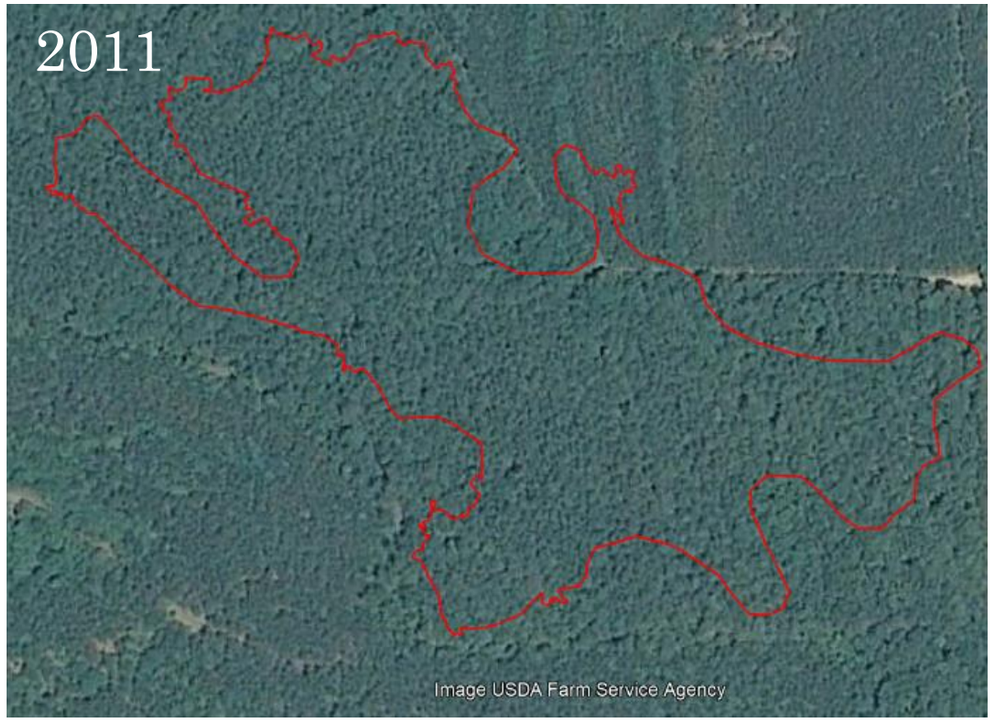


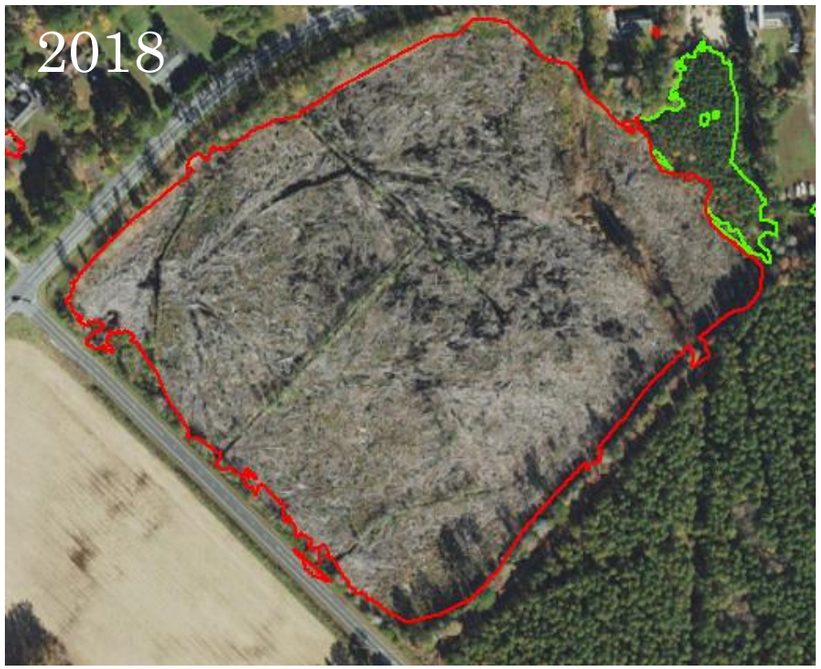
Prince George's County

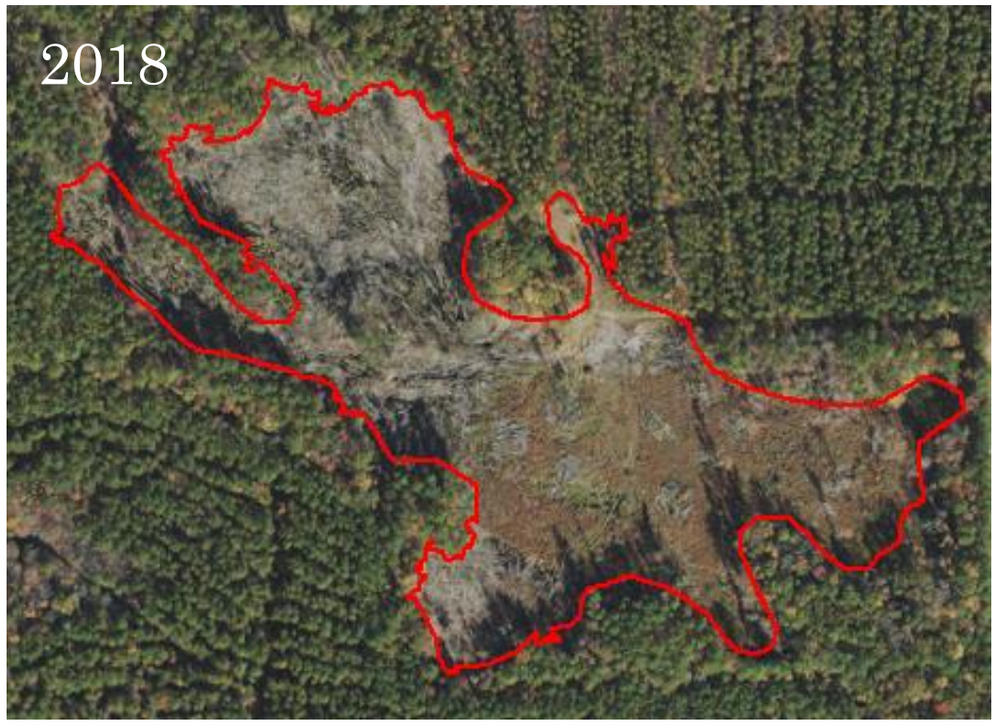
2010 Land Use on Areas of TC Loss- Lower ES



Wicomico County

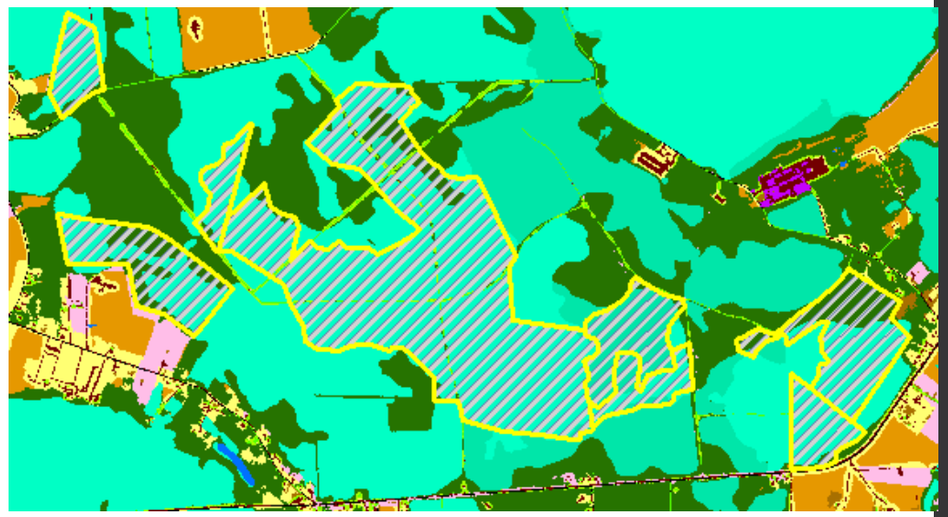


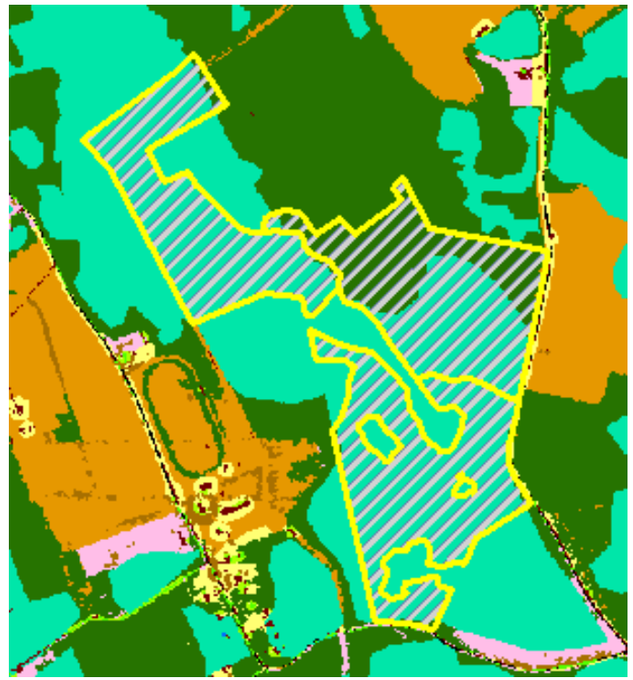




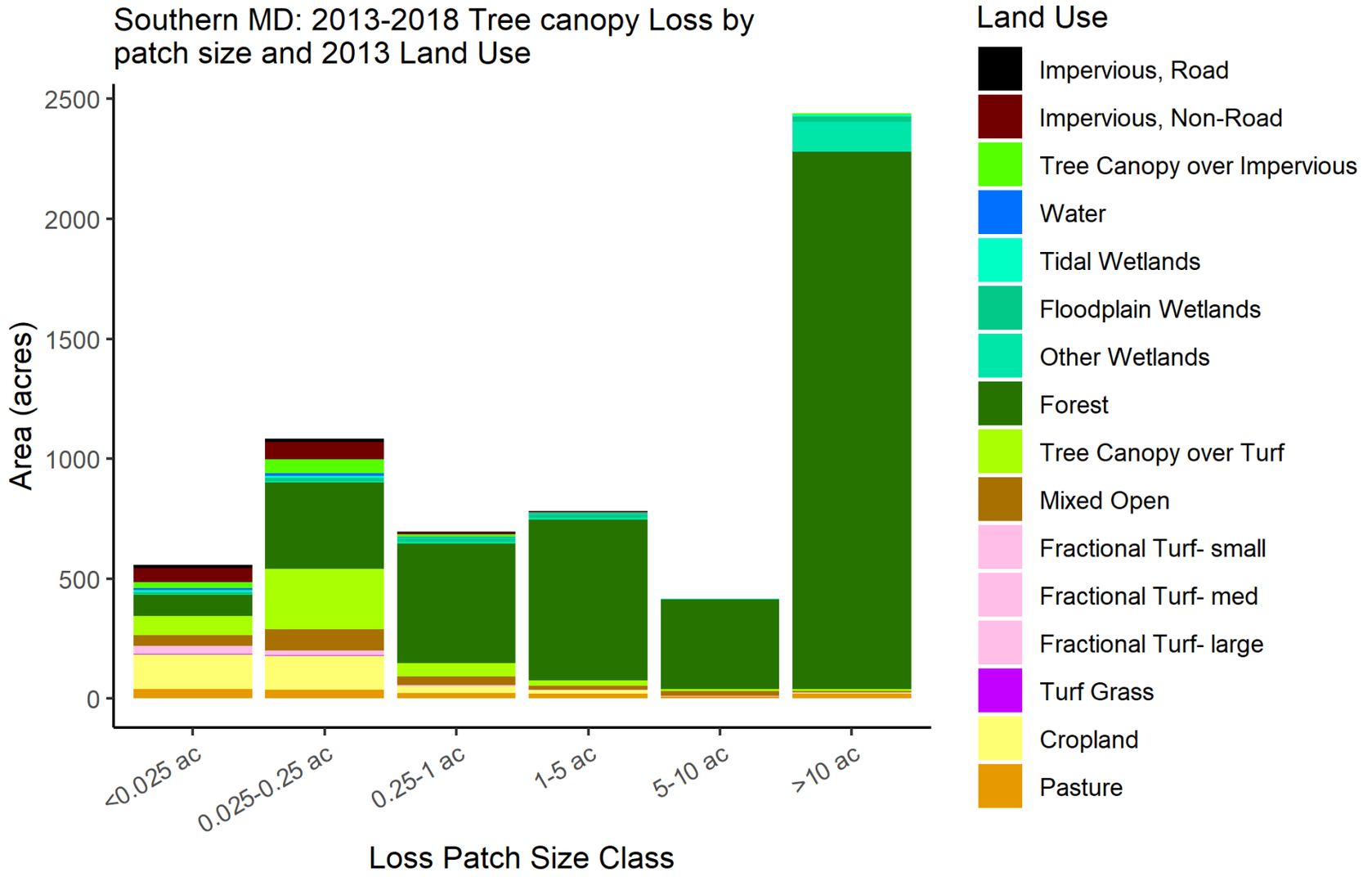
Wetland Loss?

County	TC In Saltwater Intrusion			Total Area of Saltwater Intrusion
	No Change	Gain	Loss	
Dorchester	32,269.09	107.30	337.64	57,897.90
Somerset	3,519.39	68.95	7.59	8,216.50
Wicomico	2,494.21	8.89	26.27	5,433.19
Worcester	2,674.80	4.90	1.29	3,265.98
TOTAL	40,957.49	190.03	372.79	74,813.57

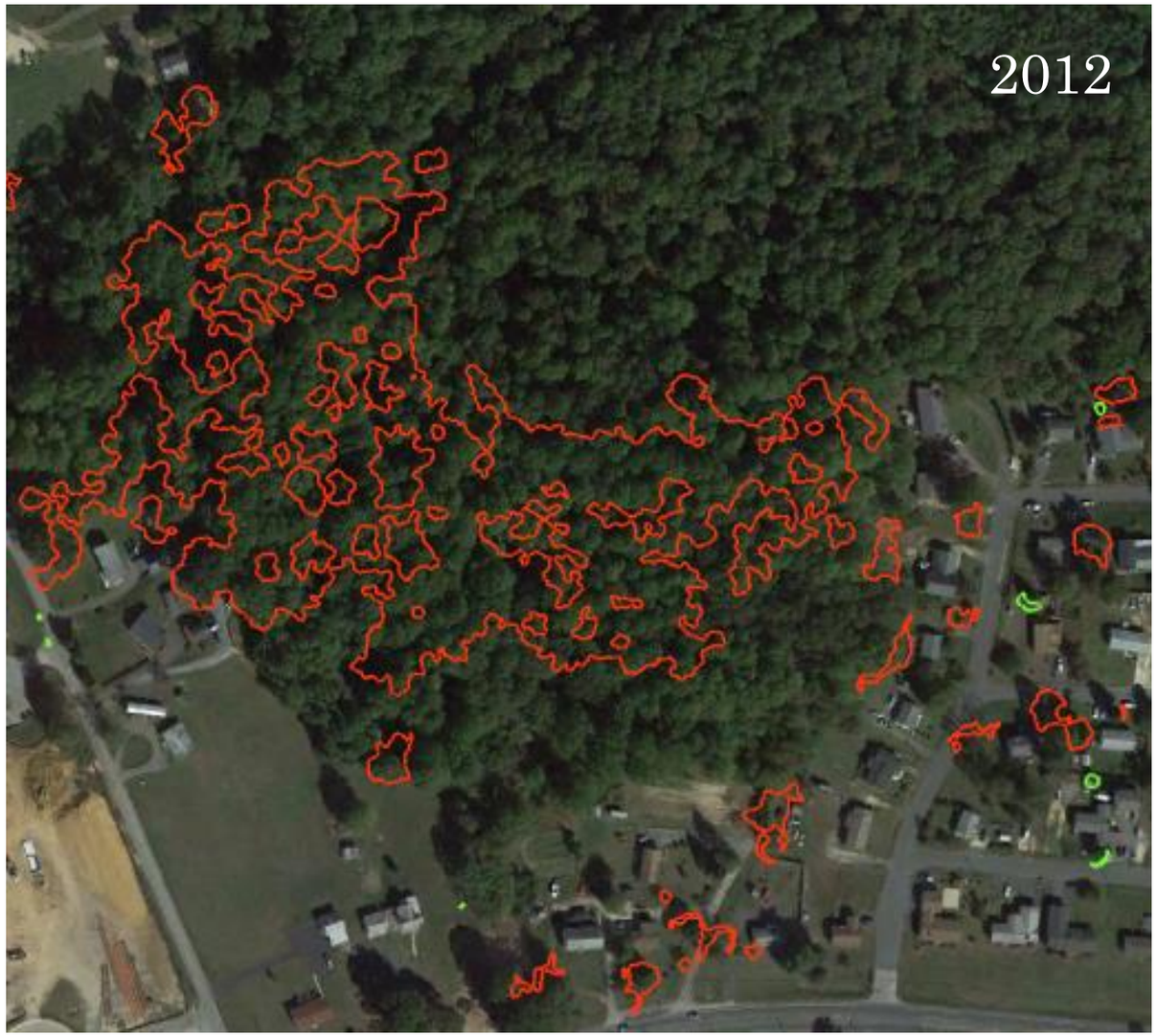


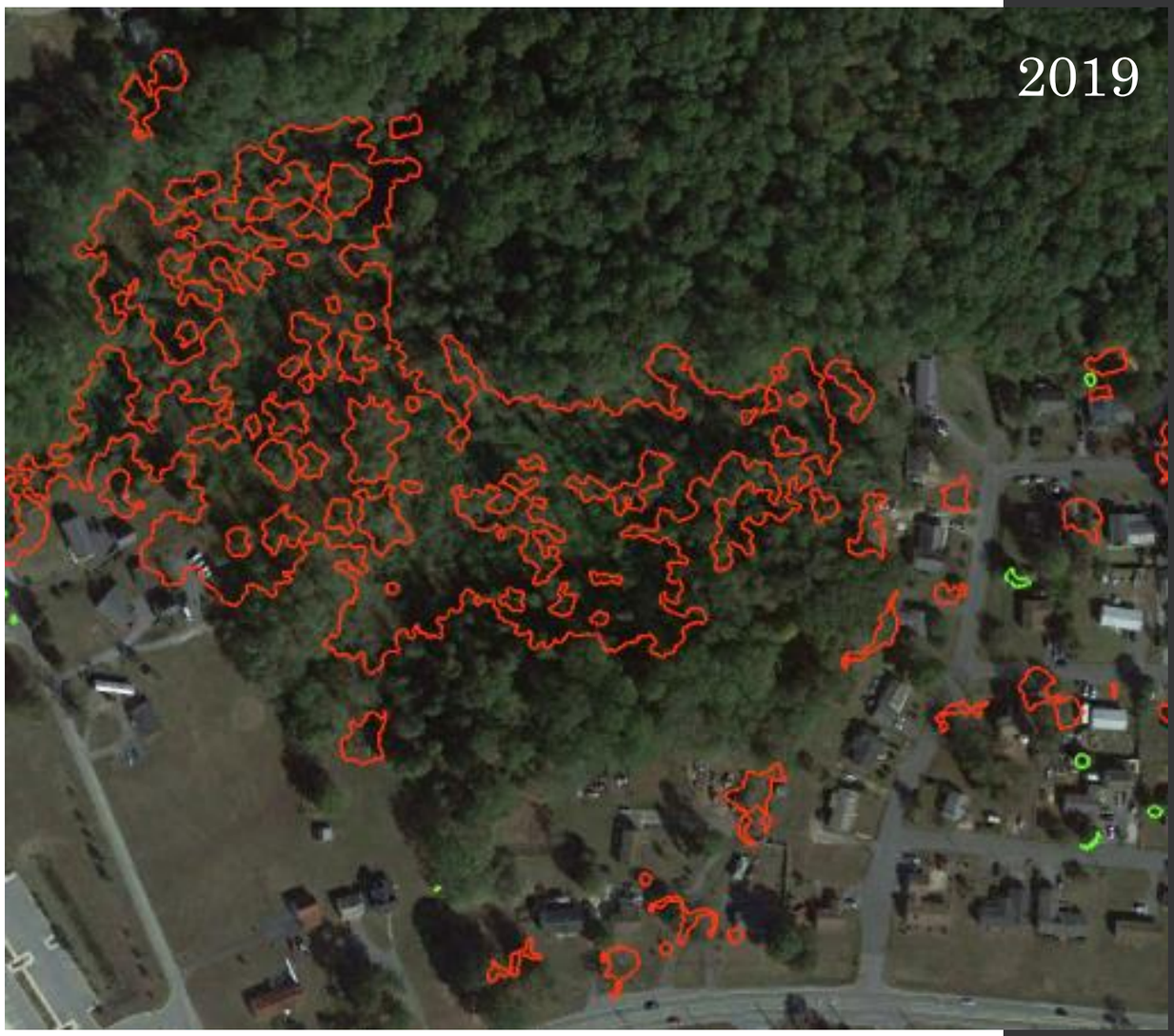


2010 Land Use on Areas of TC Loss- So. MD



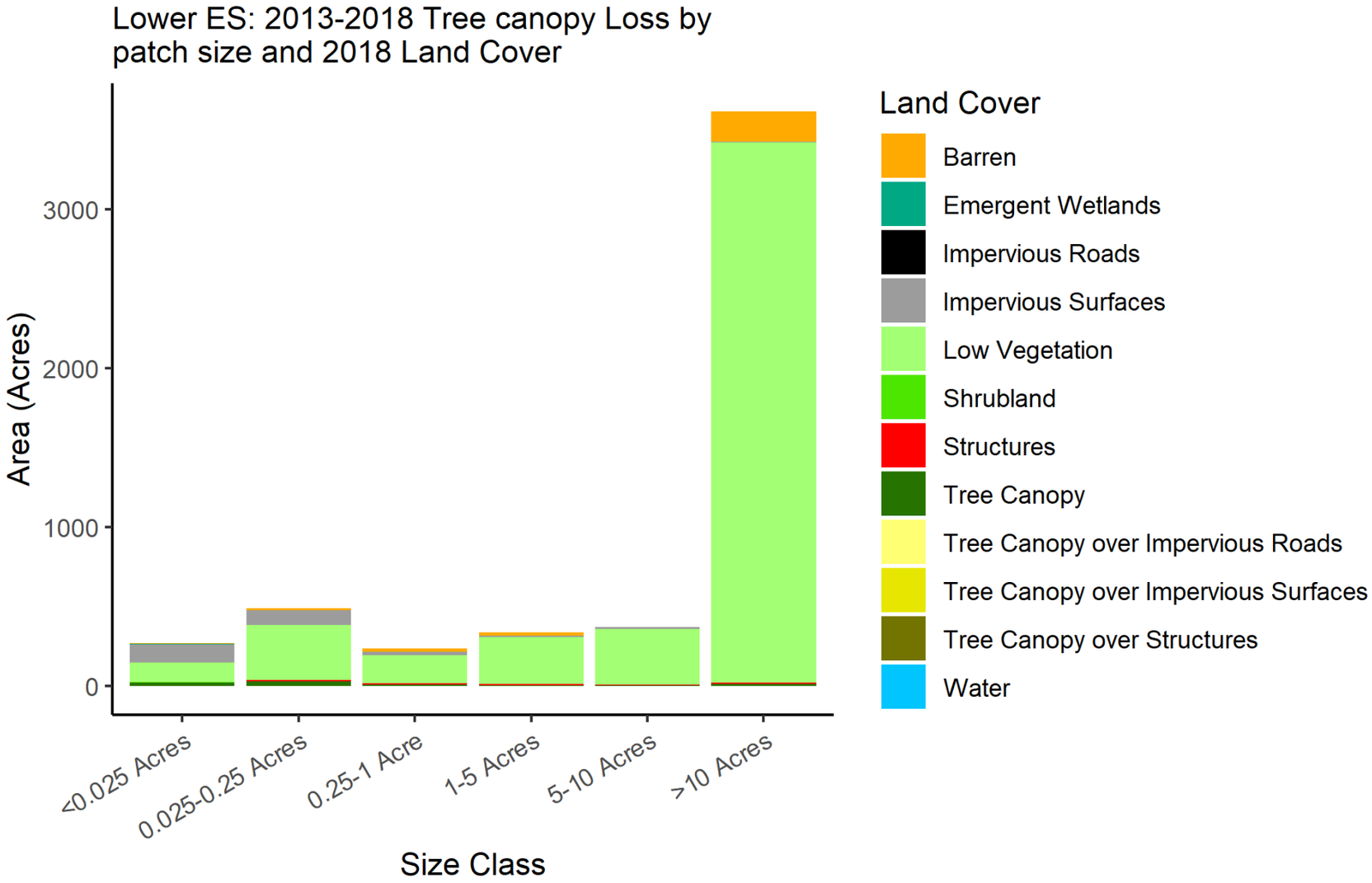
Calvert County





2018 Land Cover on Areas of TC Loss

Dorchester, Somerset, Wicomico Counties



Natural Canopy Gaps

County	Area of Natural Canopy Gap (acres)		Total Area of TC Loss (acres)
	Edge	Interior	
Anne Arundel	252.70	29.42	2,543.78
Montgomery	1,360.30	404.56	6,364.05
Prince George's	1,608.96	542.63	7,567.04
Calvert	262.86	13.56	1,566.72
Charles	225.66	48.32	2,529.30
St. Mary's	163.34	16.80	1,897.06
Dorchester	67.44	3.98	1,730.68
Somerset	45.18	3.30	1,258.22
Wicomico	114.25	11.62	2,337.47
Worcester	73.54	12.17	3,514.53
TOTAL	4,174.22	1,086.34	31,308.86

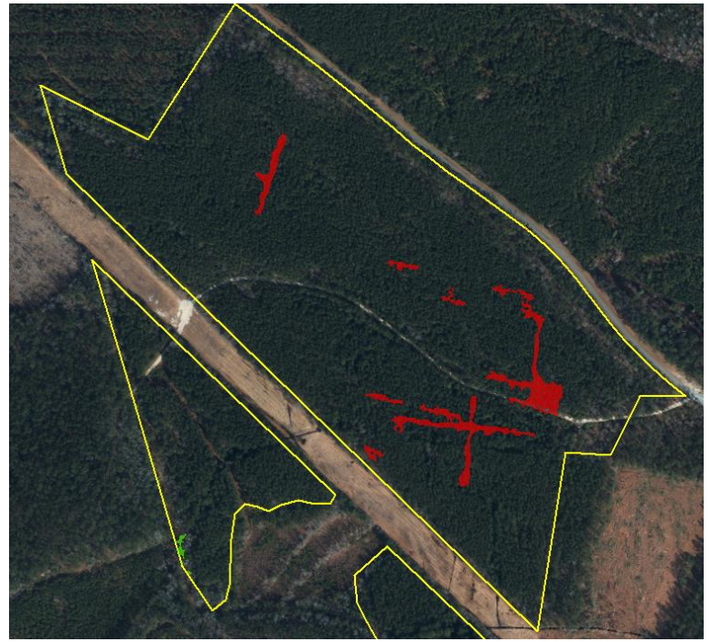
County	Healthy			Unhealthy		
	Sample Size	% TC Loss	% TC Gain	Sample Size	% TC Loss	% TC Gain
Anne Arundel	7	0	0.0005	19	5.7845	0
Prince George's	4	0.7554	0.0001	2	2.5995	0
Calvert	3	0.3412	0.1228	2	1.0649	1.0836
Charles	9	0.2094	0.8945	2	0.0654	0.0100
St. Mary's	2	0.2625	0.0048	2	2.7741	0.9098
Dorchester	2	0.0912	10.5140	6	0.0492	8.1895
Somerset	3	0	0.1078	3	0.0968	18.2604
Wicomico	2	0.0765	0.2745	6	0.0006	4.8432
Worcester	3	0	27.2065	0	NA	NA
Average		0.1940	3.1986		2.9405	3.2615

= BW Corridor = Southern MD = Lower ES

Harvests on State Forests

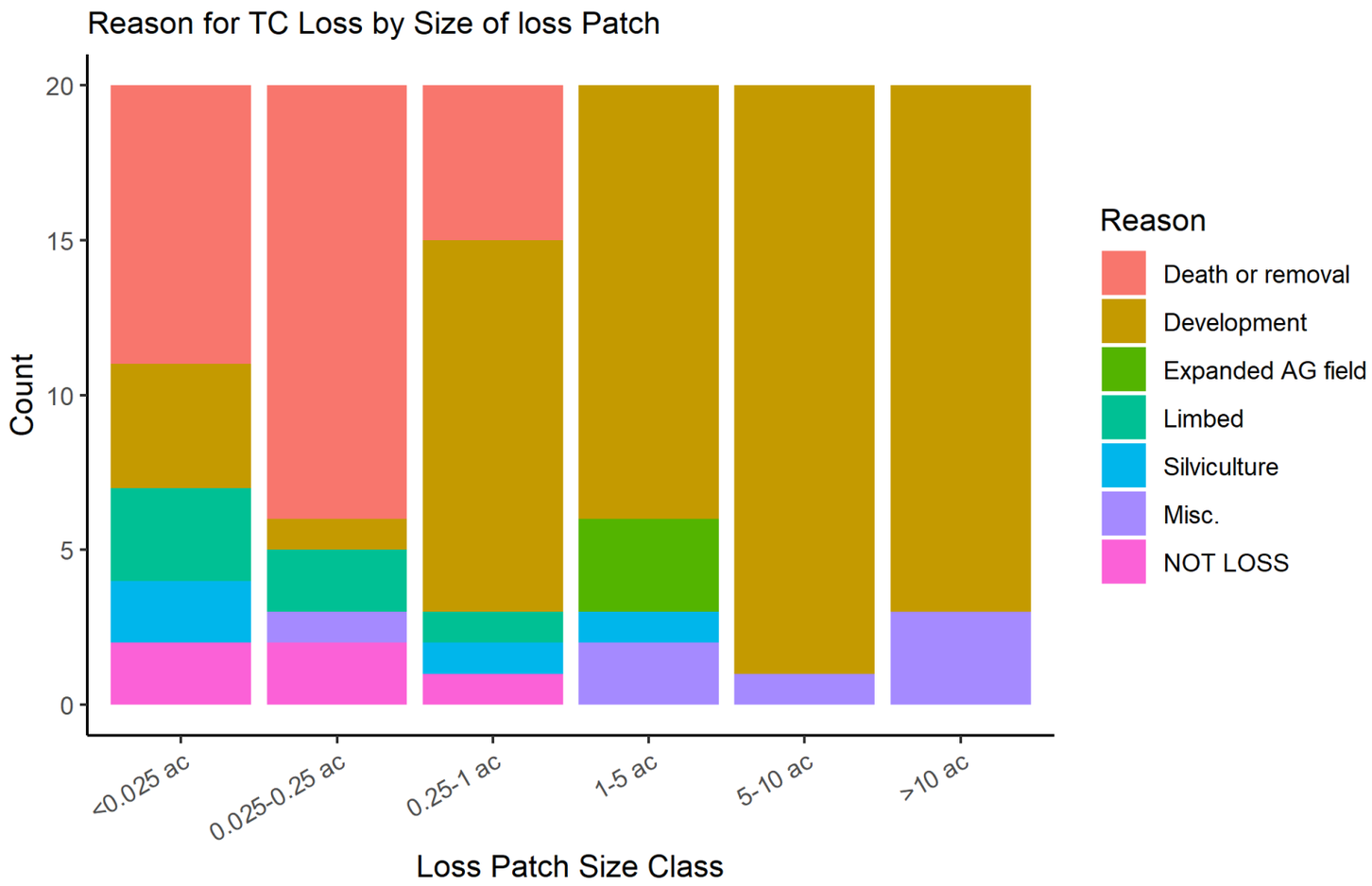
		Area on State Forest Harvests (acres)	
County	State Forest	TC Gain	TC Loss*
Dorchester	Chesapeake Forest Lands	2.20	12.26
Somerset	Chesapeake Forest Lands	1.27	33.82
Wicomico	Chesapeake Forest Lands	16.68	47.98
Worcester	Chesapeake Forest Lands	1.83	153.63
Worcester	Pocomoke State Forest	18.10	109.97
TOTAL		40.08	357.66

*Not actual TC Loss- it will grow back



Reasons for loss in Anne Arundel

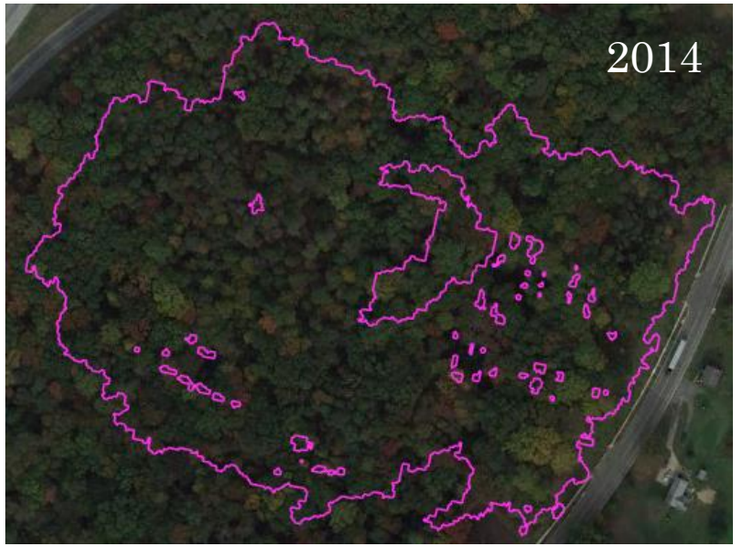
- Looked at a subset of 20 patches per size class on Google Earth



Misc. Reason:

- Stream restoration
- Road expansion
- Cell phone towers
- Shooting range
- Some not clear

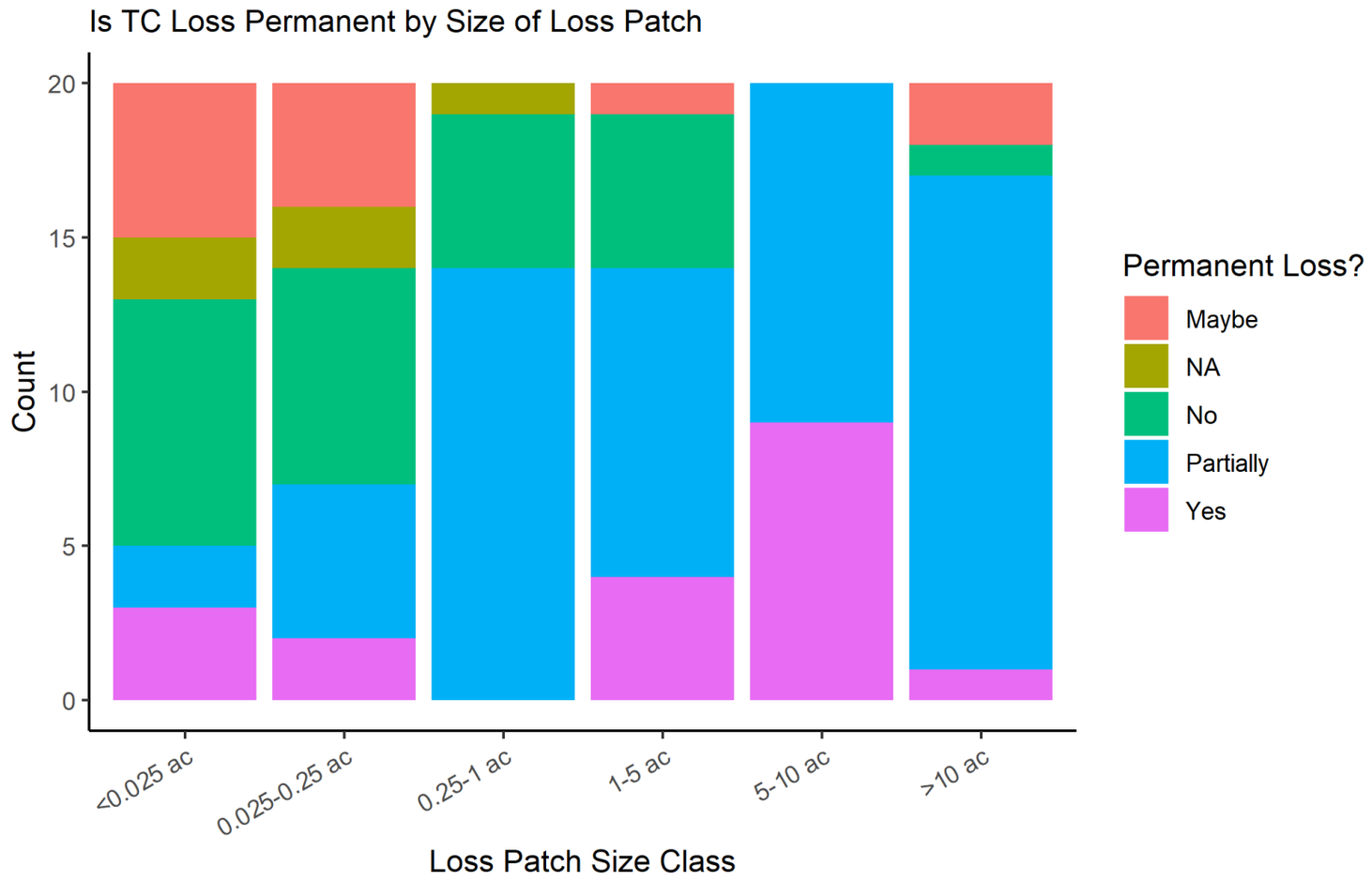
Development – 11ac Loss



Death/Removal – 0.07ac Loss

Limbed – 0.02ac Loss

Is Loss in AA Co. Permanent?

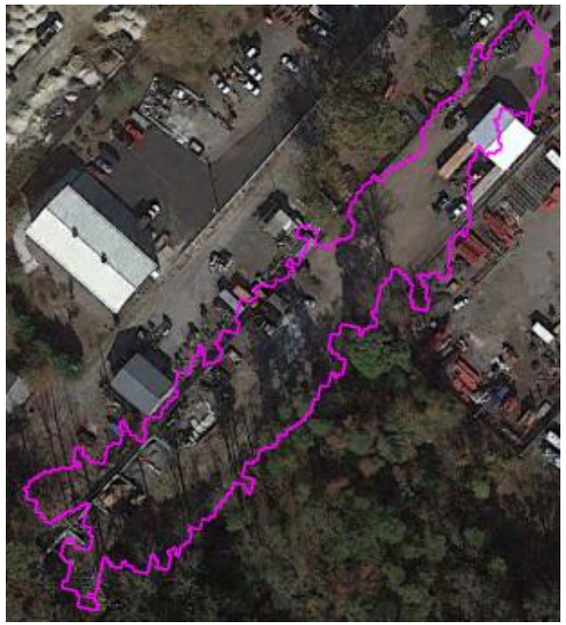


Permanent- 3.3ac

Partially Permanent- 0.4ac

Not Permanent- 1.3ac

Permanent- 1.1ac



Partially Permanent- 3.8ac

Not Permanent- 0.01ac

Conclusions

- Urban counties (BW corridor) experiencing more TC loss
  - Majority is happening in small patches in residential areas and forests
- Majority of the “loss” on the eastern shore and southern MD is from larger sections of forest being cleared
  - Mainly converted to low vegetation (Timber harvest? Ag? Something else?)
  - Likely that it is not all loss- timber harvests grow back
- Around 1/5 of TC loss seems to be “natural mortality events” in forests, but 4/5 of natural mortality in forest edge
- Timber harvests are showing up as TC loss
  - The type of harvest matters- regeneration harvest vs. thinning
- Development the main reason for large patches of loss in AA Co., death/removal for smaller patches

Planned Work

- Collect more data on healthy vs unhealthy forests
- Collect more harvest data
- Use google earth to look at loss in other counties

Questions?

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