

Agroforestry and Nutrient Credit Trading: Balancing Agricultural Production and Ecosystem Services Markets in the U.S.A.'s Chesapeake Bay Watershed

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Forest Resources Environmental Conservation



Take Home

1) Agroforestry and nutrient credit trading in Virginia

2) State of affairs in Virginia (disclaimer)

What do projects look like on the ground?

How are tradable credits determined?

3) Ways in which agroforestry can be part of the future

Refine credit ratios and implement performance crediting

Scaling, adoption, landscape level impacts

Production possibility frontier

A photograph showing a group of sheep grazing in a lush green field. In the background, there are several tall, thin trees, likely poplars, planted in rows. The scene is enclosed by a wire fence. The text "Agroforestry is..." is overlaid in yellow on the left side of the image.

Agroforestry is...

Production and Conservation

Not...





Is...

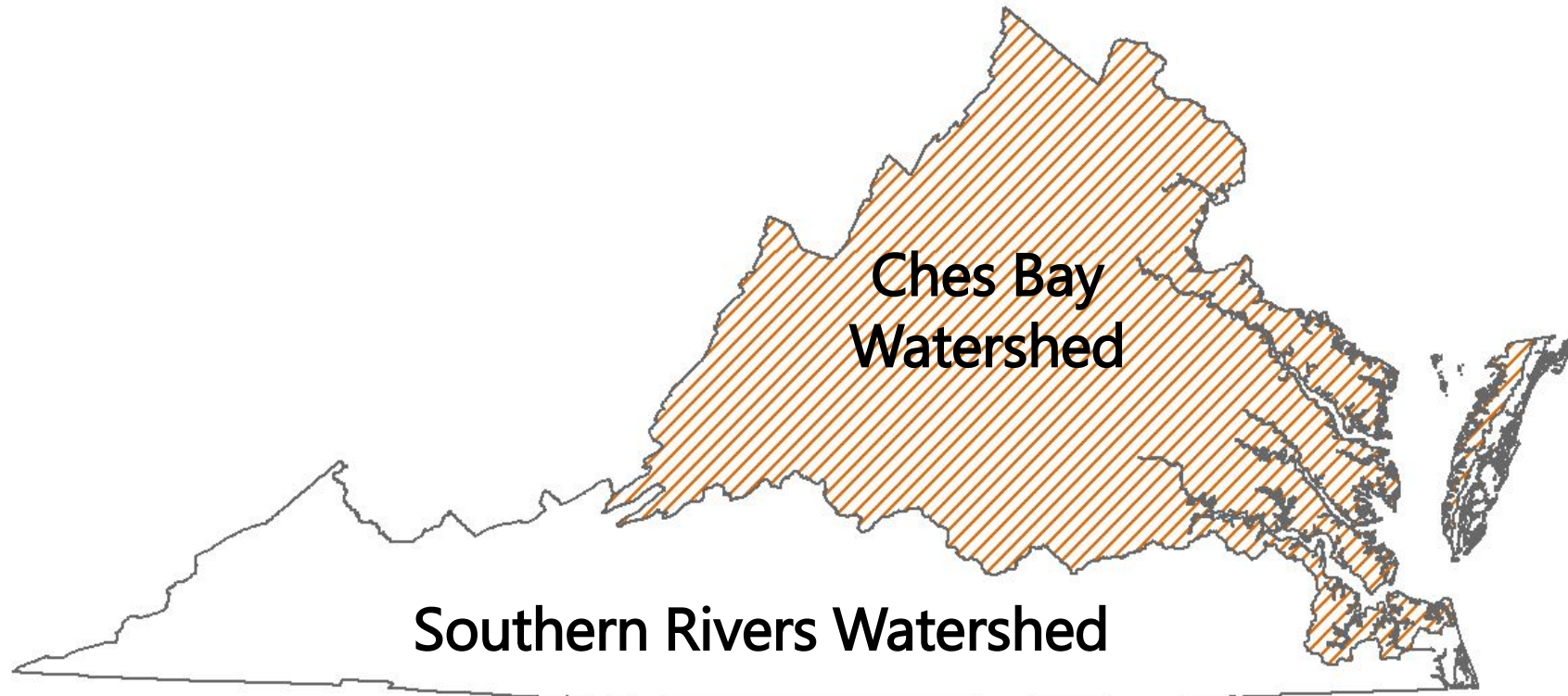


Photo courtesy of the National Agroforestry Center





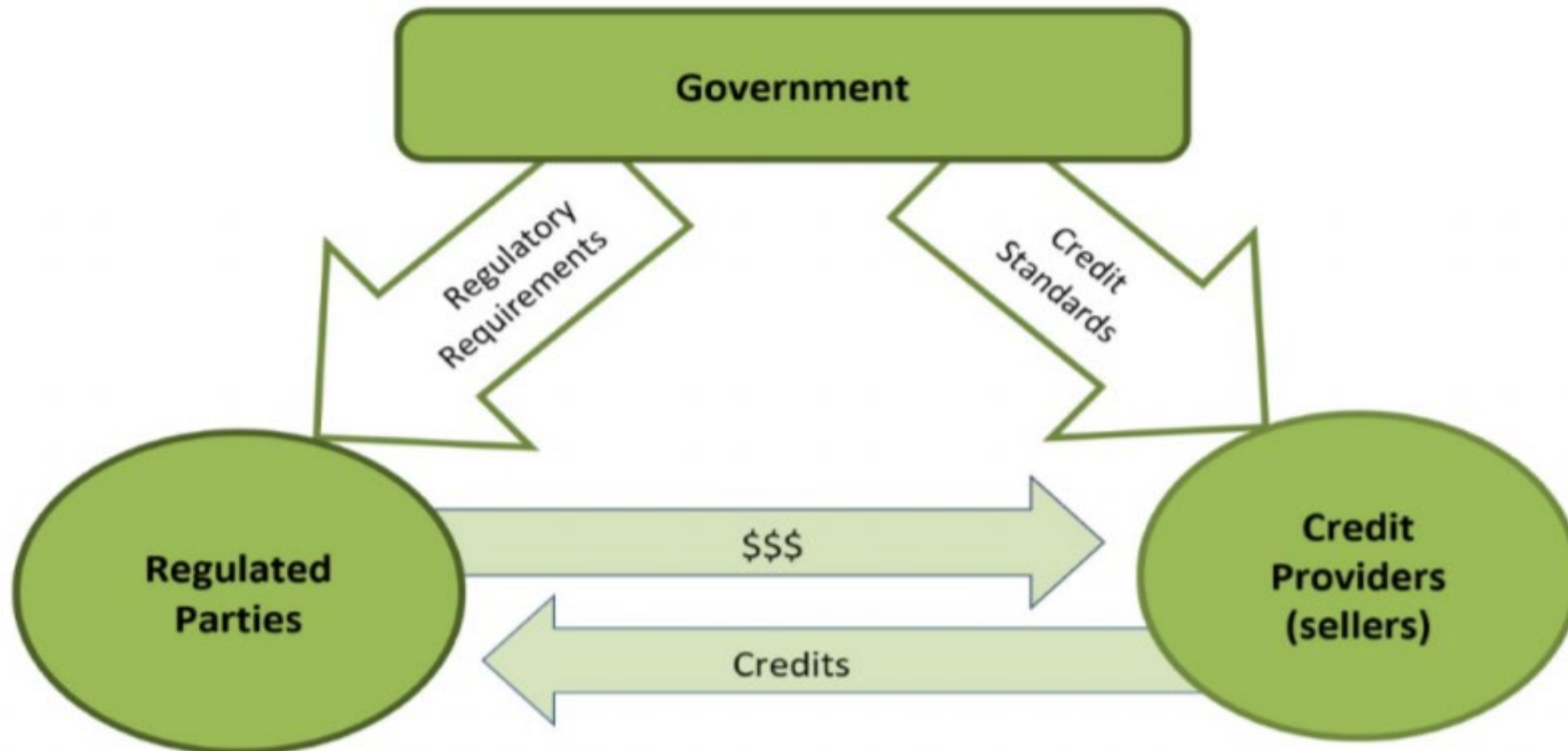
Virginia Nutrient Credit Trading Program



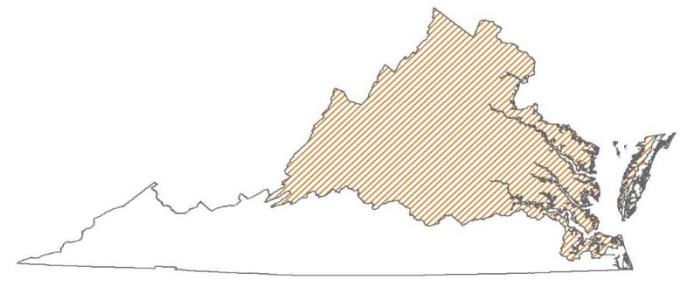
Focused on agroforestry as an accepted best practice in Virginia...

Private Market

Financial exchange between two actors that helps regulated parties come into compliance



VA Nutrient Credit Trading Program



Opened in 2009 – substantial prices for non-point credits

80+ non-point facilities (~80% CBW, ~20% SR, ~10-750 lb. P)

5,200+ pounds of P released from non-point

50%+ have been purchased, prices fluctuate

\$10k to \$67k (average ~\$20k; \$100+million, but declining?)

VDOT (~35%), private development (~55%), municipalities



Baseline

Tradable

Additionality

**Deed restricted easement
(400 tpa, management allowed)
Open land / agricultural retirement**





Baseline

Disproportionality; Essentially all upfront

Shenandoah-Potomac Basin Land Conversion

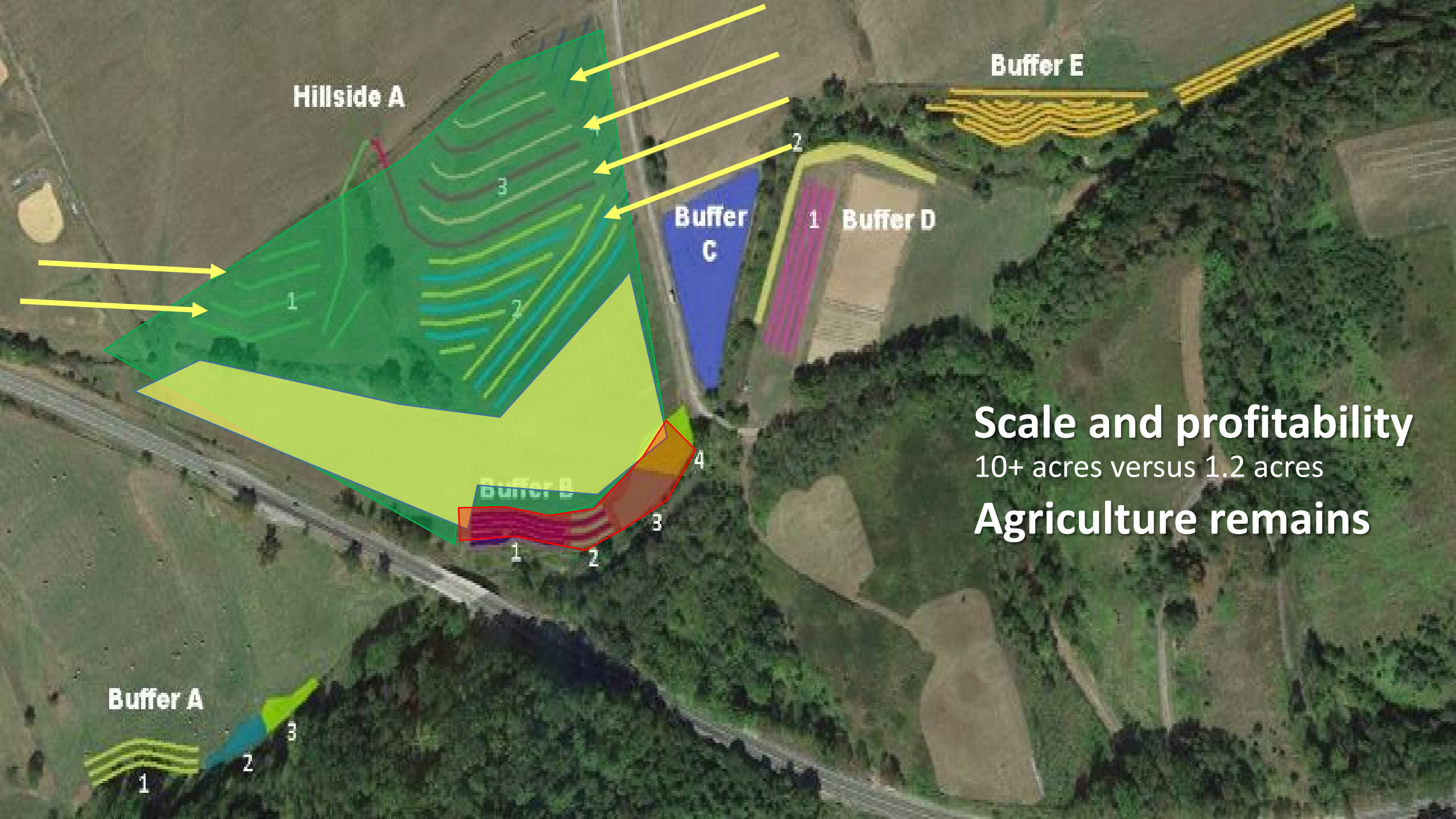
Land Conversion Type	West of I-95		East of I-95	
	TN	TP	TN	TP
Cropland to Forest	10.91	0.81	11.58	0.74
Cropland to Hay	5.77	0.58	6.40	0.26
Cropland to Mixed Open (fallow)	8.32	0.33	8.55	0.08
Hay to Forest	4.53	0.61	4.64	0.68
Hay to Mixed Open (fallow)	1.94	0.13	1.61	0.02
Pasture to Forest	0.91	0.32	2.85	0.85





Conservation Credit for Agroforestry Production





Hillside A

Buffer E

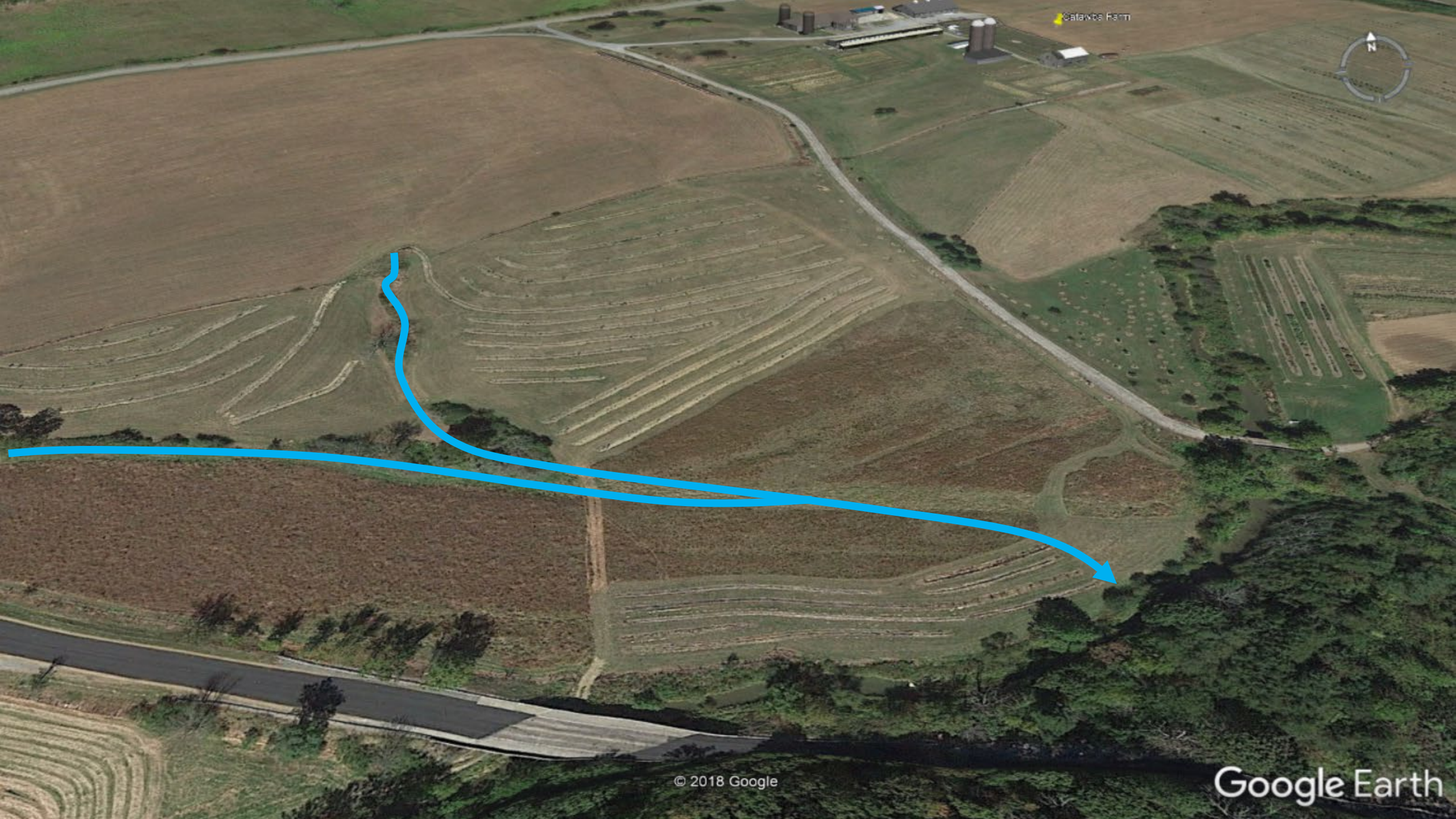
Buffer C

Buffer D

Scale and profitability

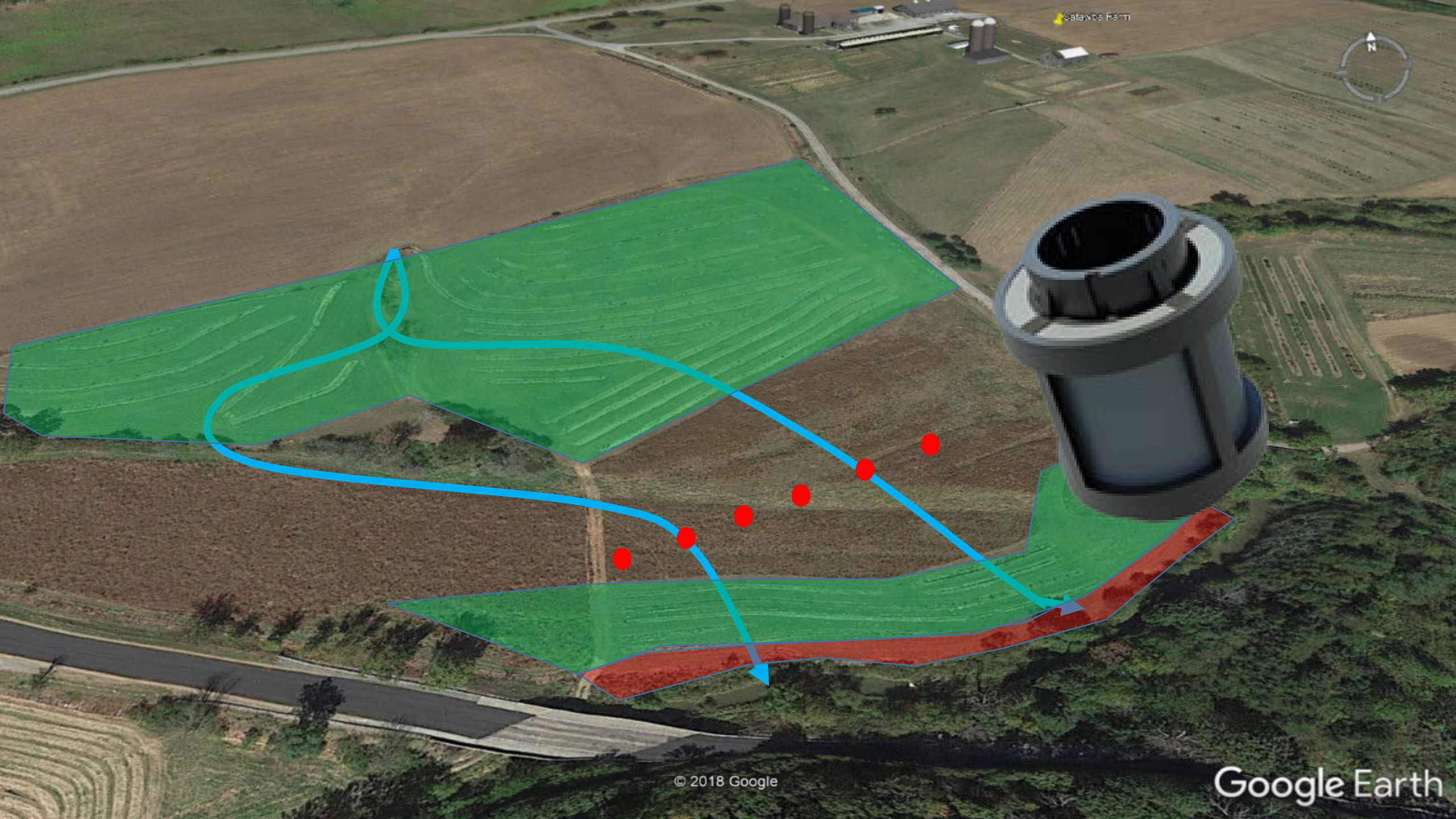
10+ acres versus 1.2 acres

Agriculture remains



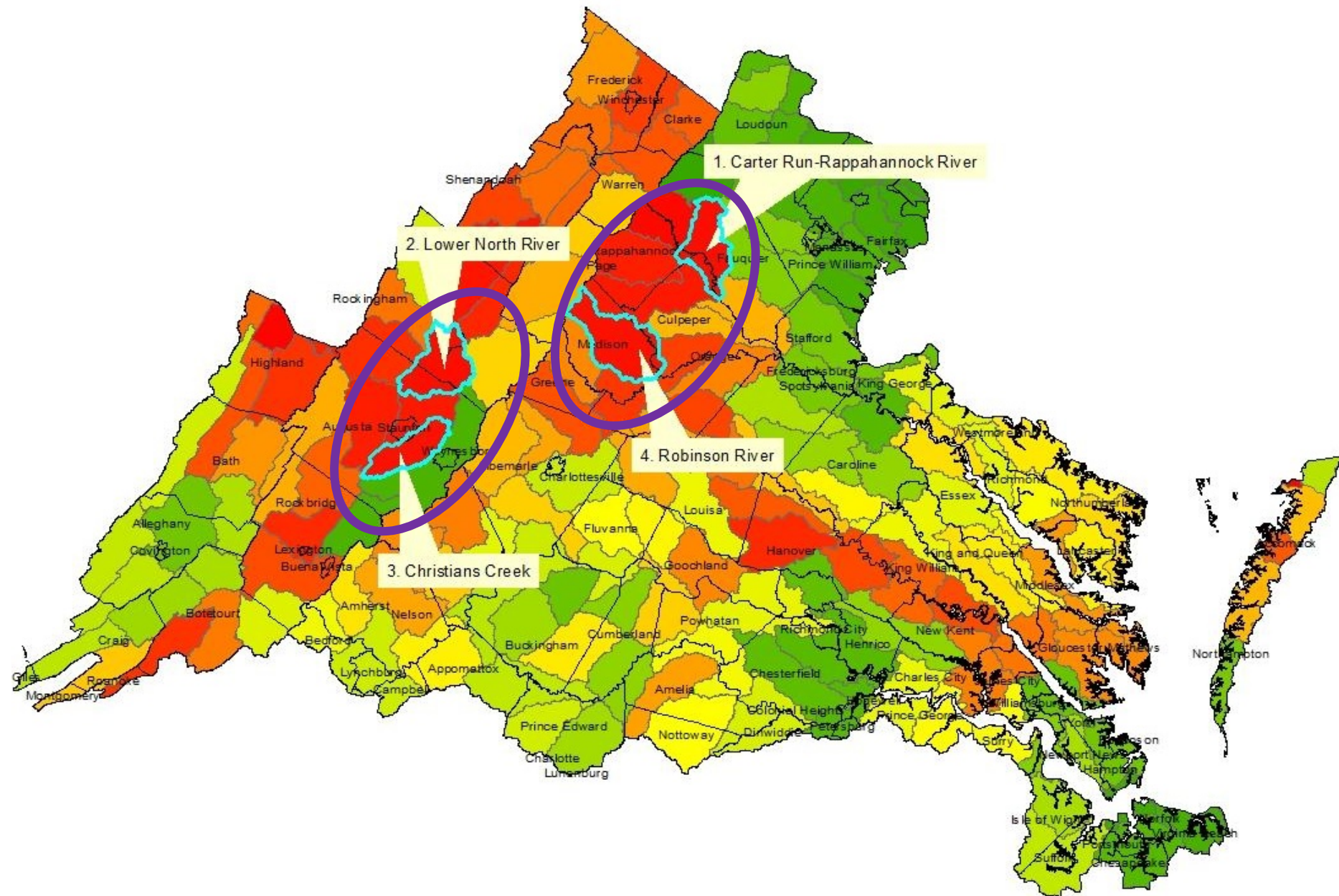
Catawba Farm





Catawba Farm





Projecting impact...

Trees in Farm Fields, Pastures, and Creek Sides

What do you think?

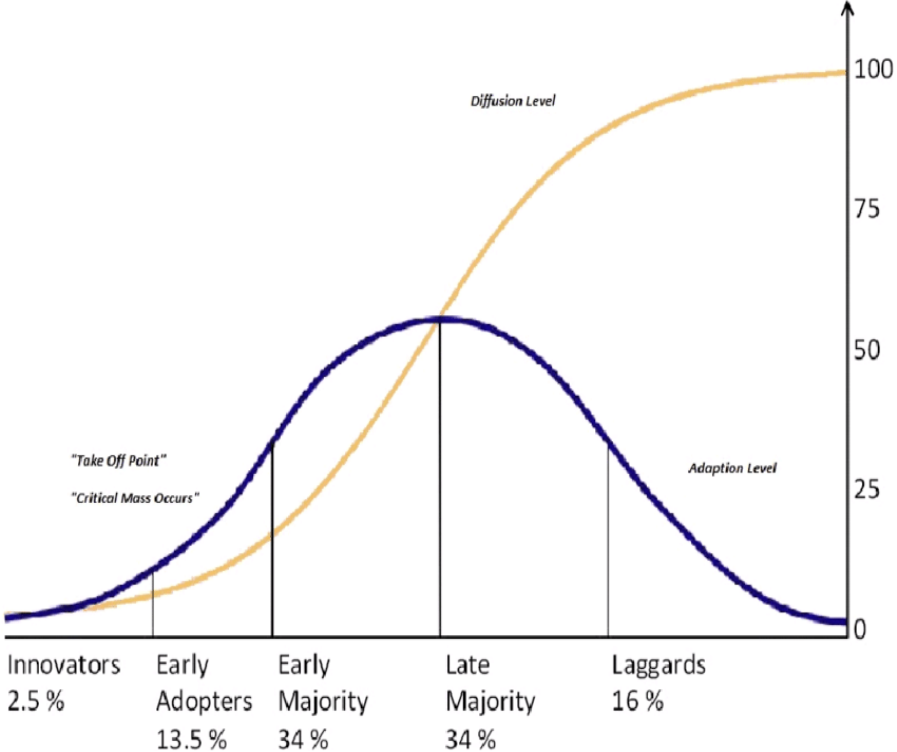


A Short Survey for Virginia Landowners

Whether you think the idea is great or terrible, your responses to this **short 3-page** questionnaire matter. They will help us piece together an honest picture of what Virginia landowners think about planting tree crops on farms, open fields and creek sides. The survey should take less than 10 minutes to complete and by law your responses will remain confidential. Thank you very much for participating. We would be happy to send you a general summary of the results if you enclose your name and address.

My Scenarios

+ Add New Scenario					
Scenario ▲	Facility	Share With			
(11) Hay without Nutrients; 0% Forest Buffer and 0% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(12) Hay without Nutrients, Agroforestry (36% Forest Buffer and 37.5% Tree Planting)	CBAFP1762	No Users	View	Edit	Delete
(13) Hay without Nutrients, 100% Forest Buffer and 100% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(21) Hay and Alfalfa All, 0% Forest Buffer and 0% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(22) Hay and Alfalfa All, Agroforestry (36% Forest Buffer and 37.5% Tree Planting)	CBAFP1762	No Users	View	Edit	Delete
(23) Hay and Alfalfa All, 100% Forest Buffer and 100% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(31) Pasture All, 0% Forest Buffer and 0% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(32) Pasture All, Agroforestry (36% Forest Buffer and 37.5% Tree Planting)	CBAFP1762	No Users	View	Edit	Delete
(33) Pasture All, 100% Forest Buffer and 100% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(41) Row Crops All, 0% Forest Buffer and 0% Tree Planting	CBAFP1762	No Users	View	Edit	Delete
(42) Row Crops All, Agroforestry (36% Forest Buffer and 37.5% Tree Planting)	CBAFP1762	No Users	View	Edit	Delete
(43) Row Crops All, 100% Forest Buffer and 100% Tree Planting	CBAFP1762	No Users	View	Edit	Delete



Production frontier

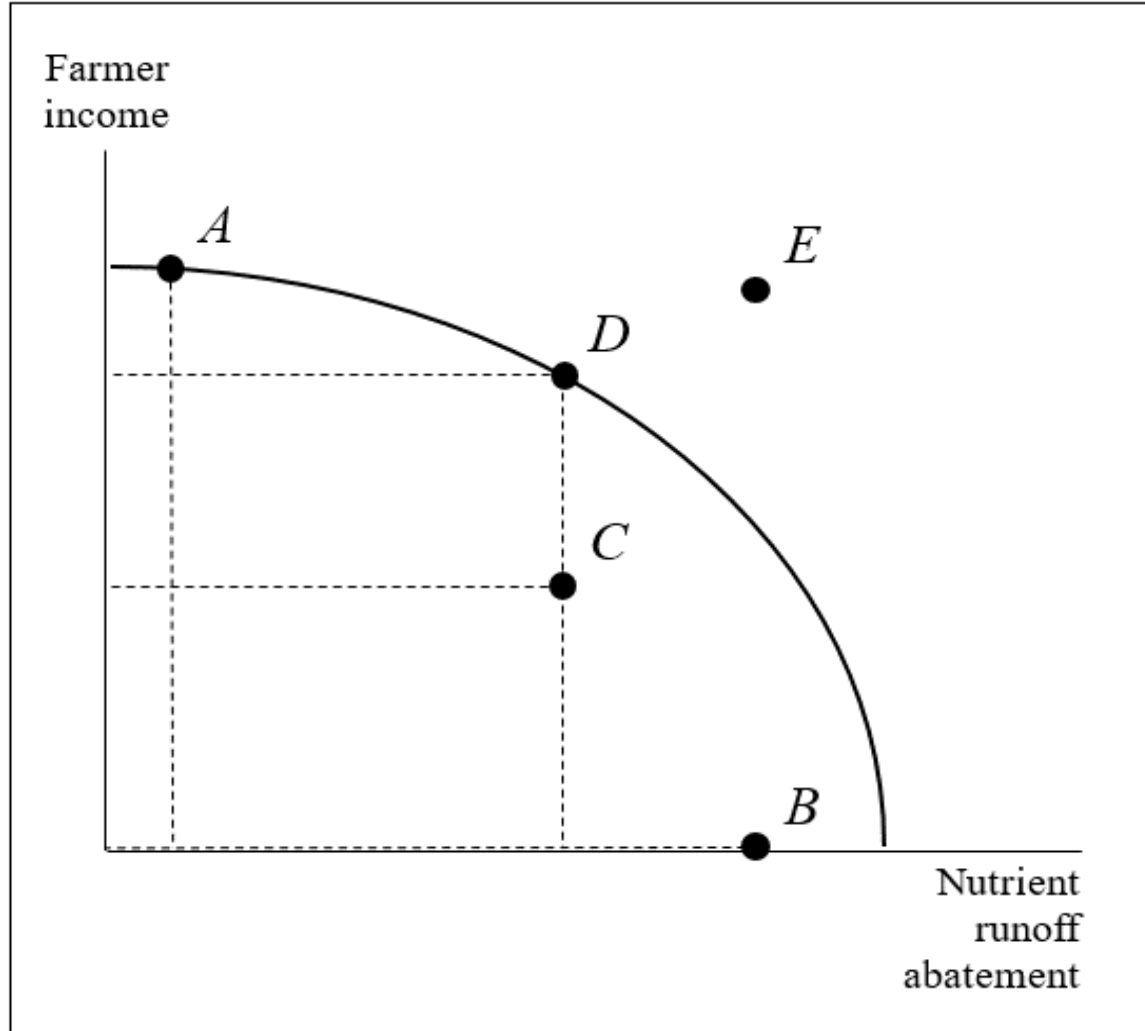


Figure 2: PPF illustrating various farm management scenarios.

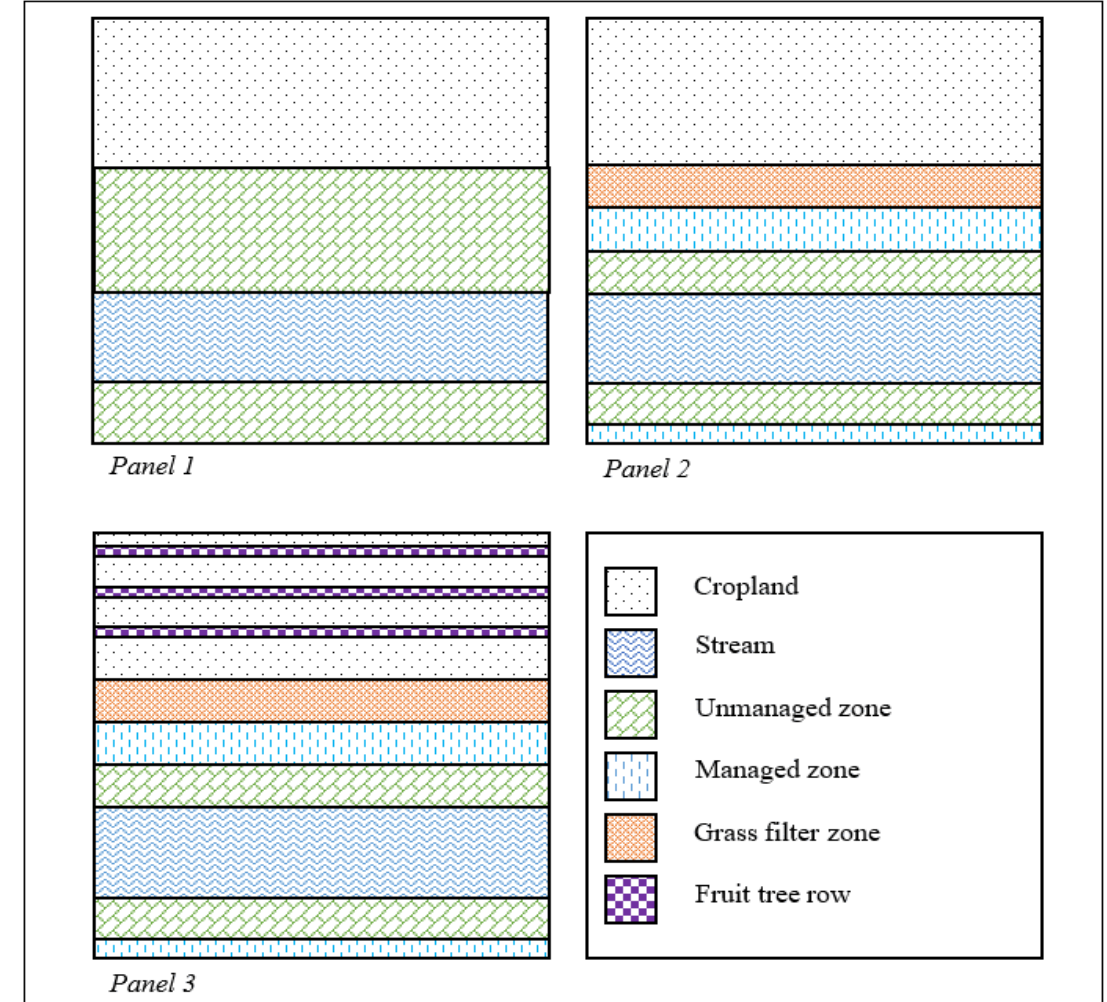


Figure 3: Graphical representation of management scenarios. Panel 1: Second alternative. Panel 2: Third alternative. Panel 3: Fourth alternative.

“Everybody loves progress,
but nobody likes to change”

Thanks