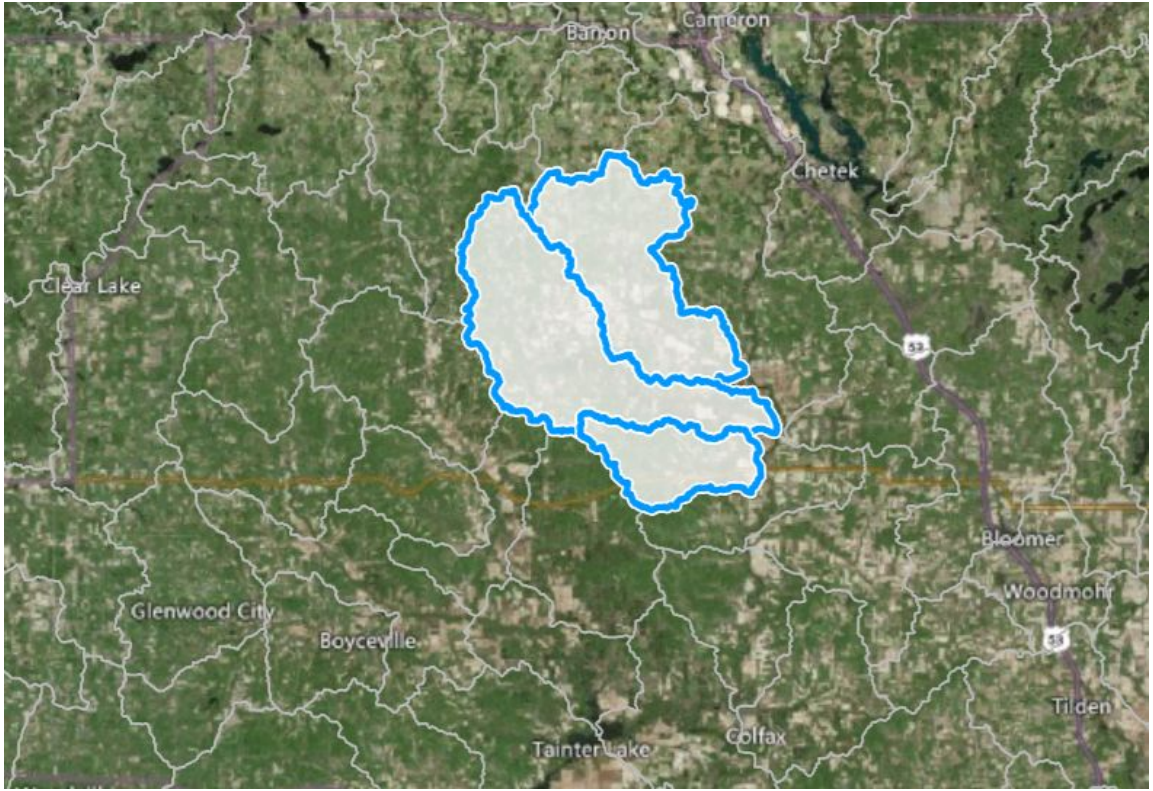
Attaining Phosphorus Reduction & Building Economic Opportunity in the Red Cedar

Can we build a local beef supply chain that will support meeting TMDL goals?

- TMDL for the Red Cedar call for a 65% reduction in Phosphorus
- What types of land conversion could allow those goals to be achieved?
- Using Grassland 2.0 tools to modeling scenarios. Modeling is intended to be illustrative, to get conversation rolling
- Case example is from the Pine Creek and Hay Creek sub watersheds.
- Converting all the continuous corn and cash grain rotations (9,376 acres = 13% of the watershed)

Pine and Hay Creek Example



SmartScape - Decision Support Tool

grassLAND 2.0

convert cash grain and corn to pasture	9,376	13

3) Manage Your Land Transformations

1 convert cash gra

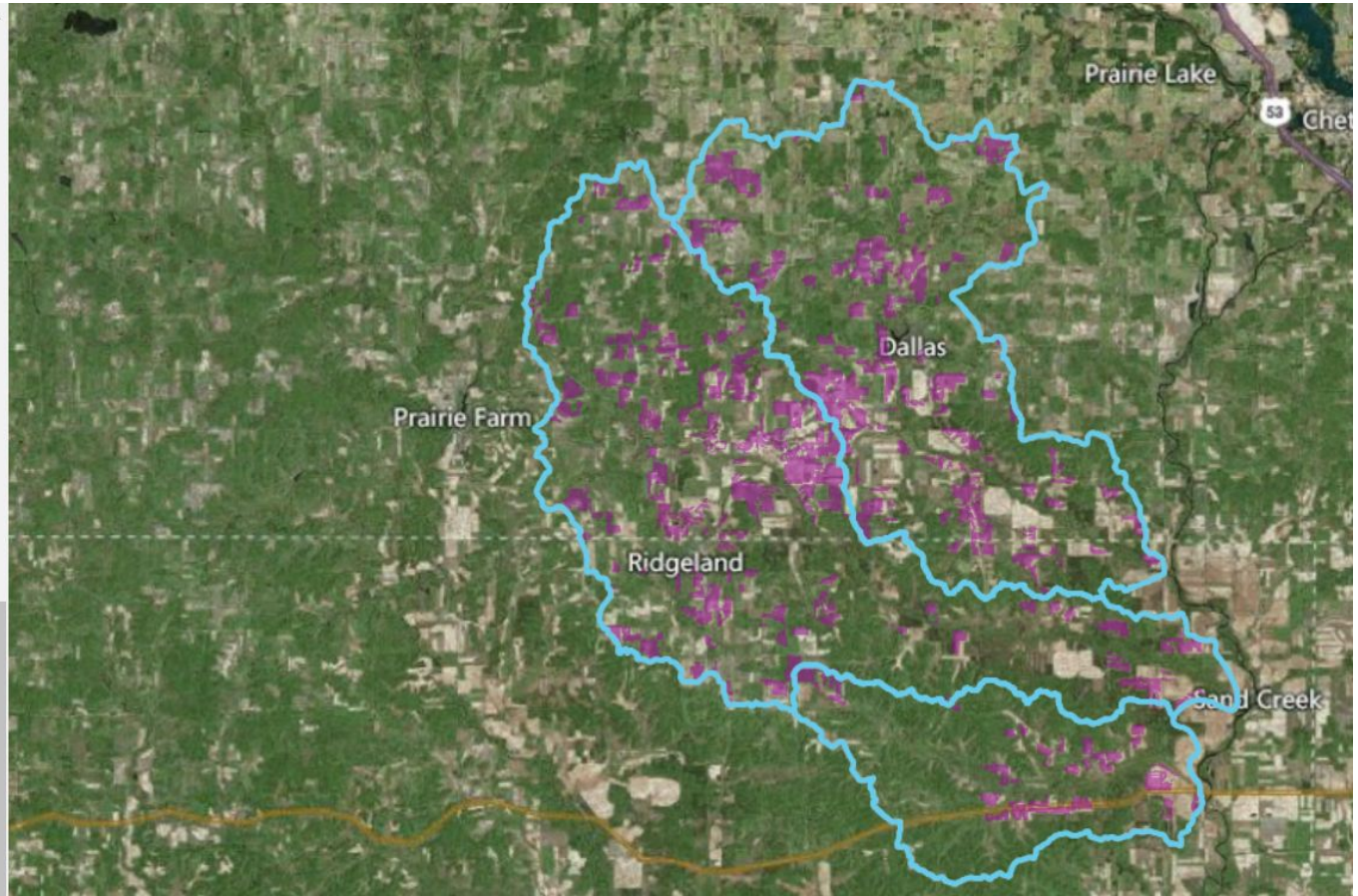
+

4) Assess Your Scenario

Assess Scenario

Loading...

Base Assumptions



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By Selection

	Per Acre			Total			
Variable	Base	Transformation	Units	Base	Transformation	Units	Relative Change
Yield	2.28	2.75	tons-dry matter/acre/year	21,346.23	25,792.14	tons-dry matter/year	21
Erosion	3.42	0.10	tons/acre/year	32,023.69	937.60	tons/year	-97
Phosphorus Loss	5.70	0.15	lb/acre/year	53,453.47	1,422.76	lb/year	-97
Total Nitrogen Loss to Water	107.72	3.87	lb/acre/year	1,009,980.46	36,248.12	lb/year	-96
Soil Conditioning Index	0.20	1.88	sci	NA	NA	NA	840
Runoff (3 inch Storm)	1.11	0.51	inches	870.94	401.64	acre-ft	-54
Honey Bee Toxicity	0.51	0.00	insecticide index	NA	NA	NA	-100
Curve Number	76.7	62.3	curve number	NA	NA	NA	-19
Bird Friendliness	0.25	0.53	bird friendliness index	NA	NA	NA	112
Cost per Ton-Dry	6249	233	$/acre/year	58,593,176	2,185,914	$/year	-96

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	Per Acre			Total				
Variable	Base	Transformation	Units	Base	Transformation	Units	Relative Change	Help
Yield	1.63	1.70	tons-dry matter/acre/year	113,472.91	117,918.86	tons-dry matter/year	4	
Erosion	1.25	0.79	tons/acre/year	86,584.48	54,574.69	tons/year	-37	
Phosphorus Loss	2.28	1.53	lb/acre/year	158,202.36	106,187.78	lb/year	-33	
Total Nitrogen Loss to Water	33.96	19.95	lb/acre/year	2,359,996.43	1,386,264.64	lb/year	-41	
Soil Conditioning Index	1.66	1.88	lb/acre/year	NA	NA	NA	13	
Runoff (3 inch Storm)	0.83	0.75	inches	4,802.99	4,333.68	acre-ft	-10	
Honey Bee Toxicity	0.11	0.04	insecticide index	NA	NA	NA	-64	
Curve Number	68.6	66.6	curve number	NA	NA	NA	-3	
Bird Friendliness	0.20	0.28	bird friendliness index	NA	NA	NA	40	
Cost per Ton-Dry Matter	1036	225	$/acre/year	72,013,419	15,606,178	$/year	-78	

Building Grass-Fed Beef Supply Chains to Support Water Quality

Production Assumptions on Beef Cattle and Stocking Rates

Cow/Calf- Birth to 700#

- .4 head/acre
- Profit $132/acre

Stockers- on pastures at 700# and off at #970

- 1.2 head/acre
- Average 1.5lbs of daily gain
- Profit $298/Acre

Finishing- on pastures at #970 and off at #1300

- .8 head/acre
- Sold for $1,665/hd at open market. Sold for $2,200 in grass fed market (Wisconsin Grassfed Co-op; or 1000 Hills)
- If sold at Co-op, profit $477/acre

	All Values on a Per Head Basis											
	Weight at Beginning	Weight at End	Age in Mo at End	Acres Needed Pasture + Hay *		Purchase Price Beginning ($/Hd)**	Price at End of Phase ($/Hd)**	Cost of feed	Other Cost	Total Cost	Profit per Head	**Profit per Acre**
Cow Calf - Weaned Calf Sold Weaned		550	7	2 3/5	2.60		$1,045	$453	$250	$703	$342	$132
Weaned calf to pre-feeder	550	700	12	1/2	0.52		$1,200	$155	$50	$205		
Total for Feeder (Stocker)								$608	$300	$908	$292	$94
Stocker (Pre-feeder to Transfer to Finishing)	700	970	18	5/6	0.83	$1,200	$1,510	$62		$62	$248	$298
Finishing - Grassfed (Stocker to Finished)	970	1300	24	1 1/4	1.25	$1,510	$2,200	$94		$94	$596	$477

*Dunn Co. Sandy Loam Soils and Assumes

**Prices based on grassfed beef for finishing. USDA AMS Conventional price for feeders and stockers.

Some guides for estimating beef product output

https://beef.unl.edu/beefwatch/2020/how-many-pounds-meat-can-we-expect-beef-animal

Wholesale cut	Pounds	Percent of carcass
Chuck	236	26.8
Rib	84.5	9.6
Brisket	33.5	3.8
Shank	27.4	3.1
Short Plate	73	8.3
Flank	45.75	5.2%
Round	197	22.4
Loin	151.4	17.2
Hanging tender, kidney fat & cutting losses	31.7	3.6
Total	880	100%

Source: How Much Meat to Expect from a Beef Carcass, University of Tennessee Extension PB1829

Appendix

Notes acres to animals - stocking rates

https://beef-cattle.extension.org/how-many-acres-does-it-take-to-run-a-beef-cow/

John Strauser
7:17 PM Today

Jim thinks the number here is low. He advised we take the total weight 1300 and do 58% of that as the meat.

John Strauser
7:19 PM Today

So we would have about 754lbs of meat per animal.

John Strauser
7:21 PM Today

624 of sellable beef.

John Strauser
7:25 PM Today

average beef consumption 57lbs/year