

Fractional Land Uses

Peter Claggett, USGS

May 23, 2016

WQGIT Call

Q: How do we classify barren cover and herbaceous vegetation within land use polygons where such lands are not clearly 100% turf grass, impervious, or mixed open (e.g., junkyards, college campuses, federal facilities)?

Option #1: Cluster the local land use classes into groups wherein all barren and herbaceous vegetation will be classed as either 100% turf grass, 100% impervious, or 100% mixed open.

Option #2: Do #1 and create new groups for land uses wherein all barren and herbaceous vegetation will be classed as part turf, part mixed open, and/or part impervious.

IMPORTANT: These options ONLY apply to areas where we have accurate local or regional land use data and ONLY to barren and herbaceous land cover classes within select land uses.

Problem: How to Classify Barren and Low Vegetation Land Cover within different “Land Uses”

Classify as 100% Turf Grass

Class Name	Rationale
Mixed Single/Multi-unit Residential	Most likely lawns
Single Family Dwellings	Most likely lawns
Multi-family dwellings	Most likely lawns
Mobile Homes	Most likely lawns
Retail, wholesale, professional	Most likely lawns
Other Commercial	Theaters and hotels where pervious is maintained
Parking Lots	Most likely lawns
Marinas/Port Facilities/Docks	Most likely lawns
Other Urban	Most likely lawns
Recreational	Most likely lawns
CAFOs	Most likely lawns surrounding structures
Farmsteads	Most likely lawns surrounding structures
Cemetery	Most likely lawns
Sports Complex	Most likely lawns
Hospital	Most likely lawns
Seaport/Harbor	Most likely lawns
Shopping Centre	Most likely lawns
Amusement Park	Most likely lawns
Animal Park	Most likely lawns
Golf Course	Most likely lawns
Road Right-of-Way	Most likely lawns

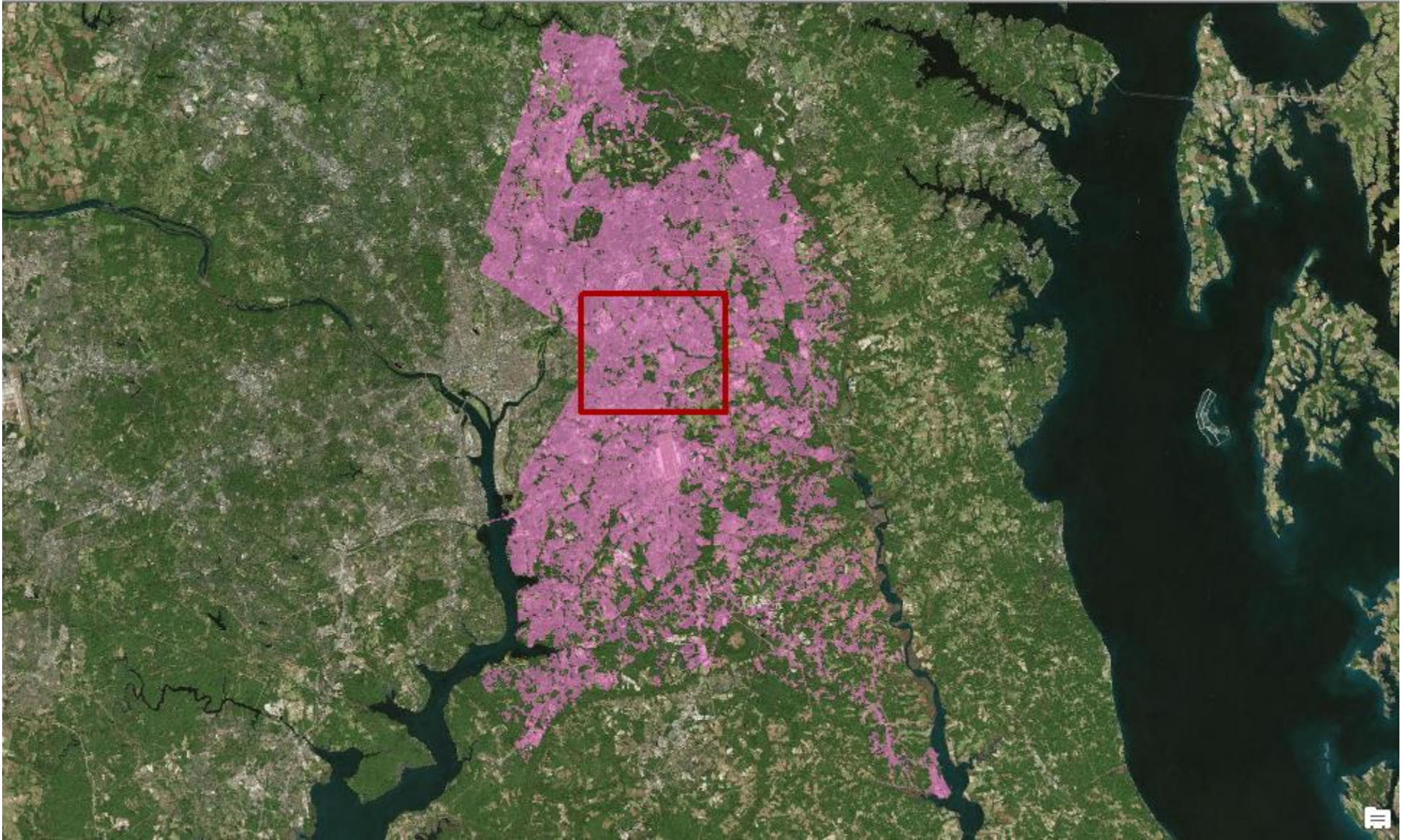
Problem: How to Classify Barren and Low Vegetation Land Cover within different “Land Uses”

Classify as 100% Mixed Open

Class Name	Rationale
Other transportation/utilities	Pervious is minimally maintained
Utilities	Pervious is minimally maintained
Herbaceous Rangeland	Pervious is minimally maintained
Shrub/Brush Rangeland	Pervious is minimally maintained
Mixed Rangeland	Pervious is minimally maintained
Beaches	Pervious is minimally maintained
Inland sandy areas	Pervious is minimally maintained
Extractive	Mix of quarries (permitted) and abandoned mines
Vacant lots	Pervious is minimally maintained
Waterbody margins	Barren is associated with exposed shorelines during low water

Classify as 100% Non-Road Impervious Surfaces

Class Name	Rationale
Railroad Right-of-Way	Pervious is compacted and graded promoting runoff



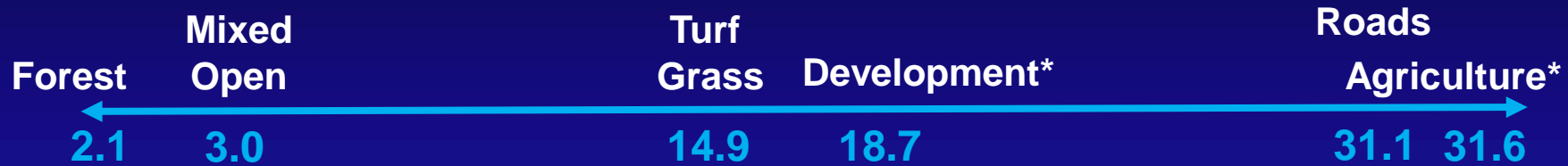
What About Road Right of Way?





Relative Nutrient Export Rates

(Forests vs Other Land Uses)



Relative Nitrogen Export Rate (lbs/acre/yr)



Relative Phosphorus Export Rate (lbs/acre/yr)

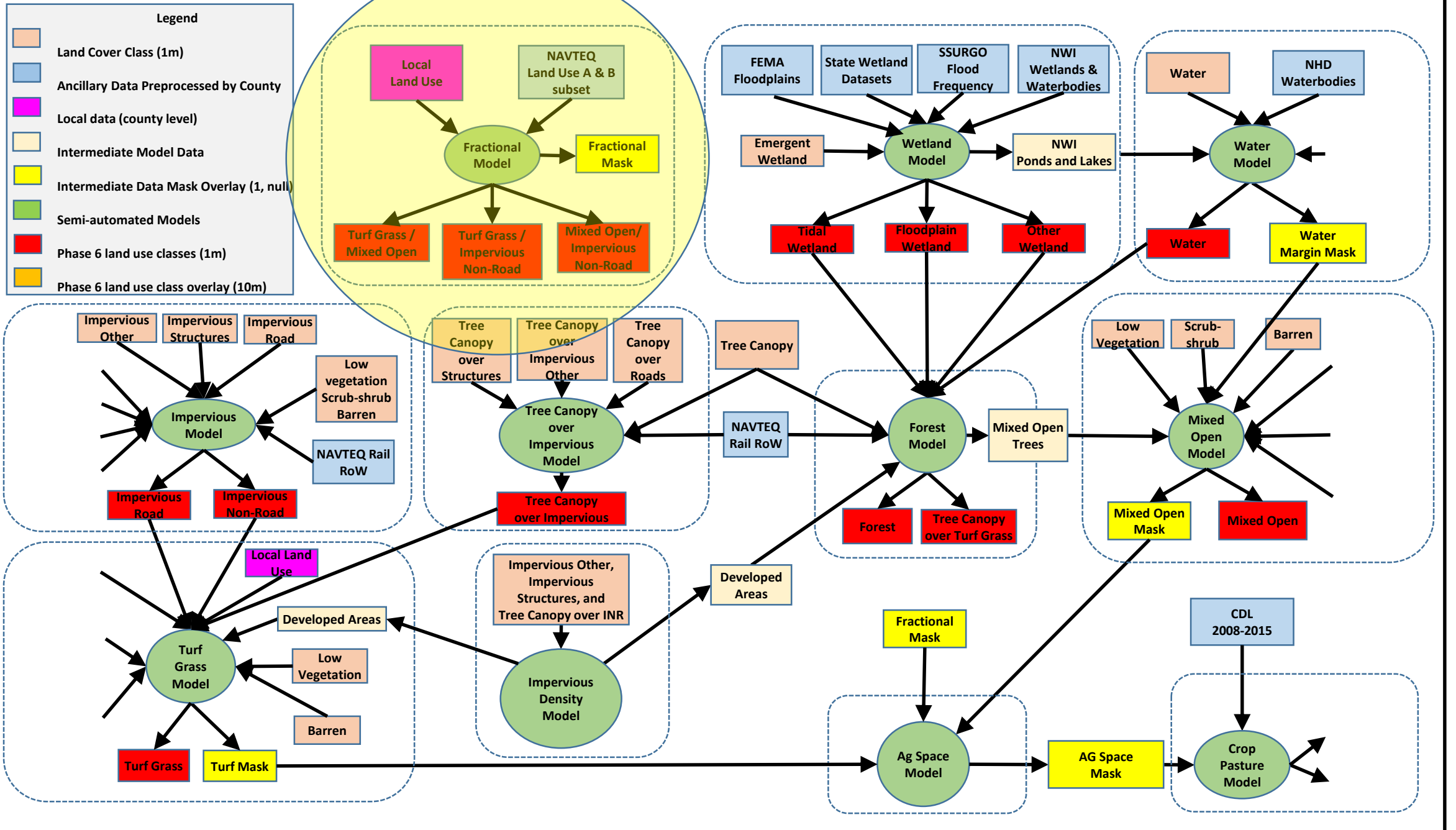
* Values for agriculture represent area-weighted averages over multiple crop and pasture types and different management regimes. Values for developed represent area-weighted averages over impervious surfaces and turf grass under different stormwater management regimes.

Only about 1.5% (285 mi²) of the non-impervious, non-tree, non-agricultural land in the watershed falls within public/protected lands.

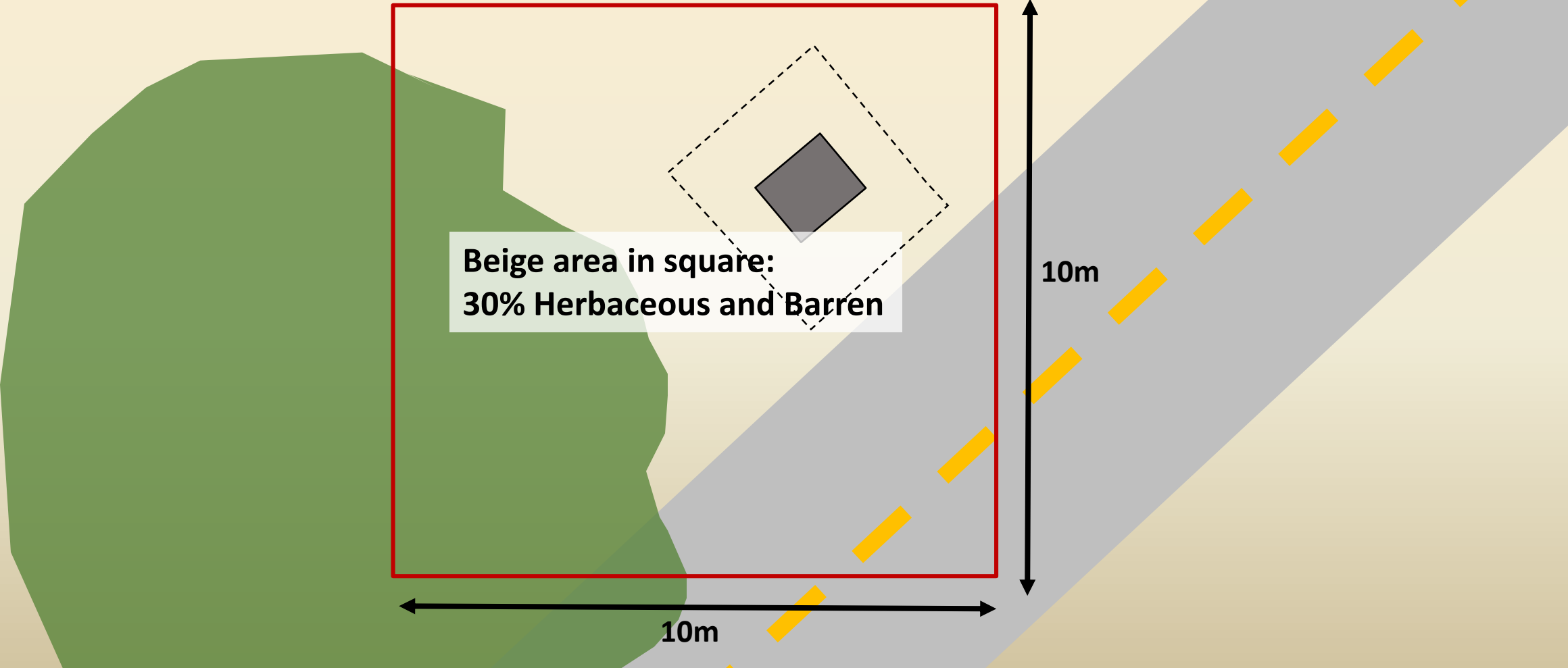
Only about 25% (77 mi²) of those areas are non-federal (e.g., county and state parks etc.)

Federal Lands			Non-Federal Lands		
2011	Sq. Miles	Percent	2011	Sq. Miles	Percent
Impervious	58	2%	Impervious	1,743	3%
Turf Grass	50	1%	Turf Grass	3,837	6%
Open Space	158	5%	Open Space	14,931	25%
Tree Canopy	53	2%	Tree Canopy	2,165	4%
Forest	2,951	86%	Forest	34,164	57%
Wetland	70	2%	Wetland	2,005	3%
Water	92	3%	Water	1,384	2%
Total	3,433		Total	60,231	

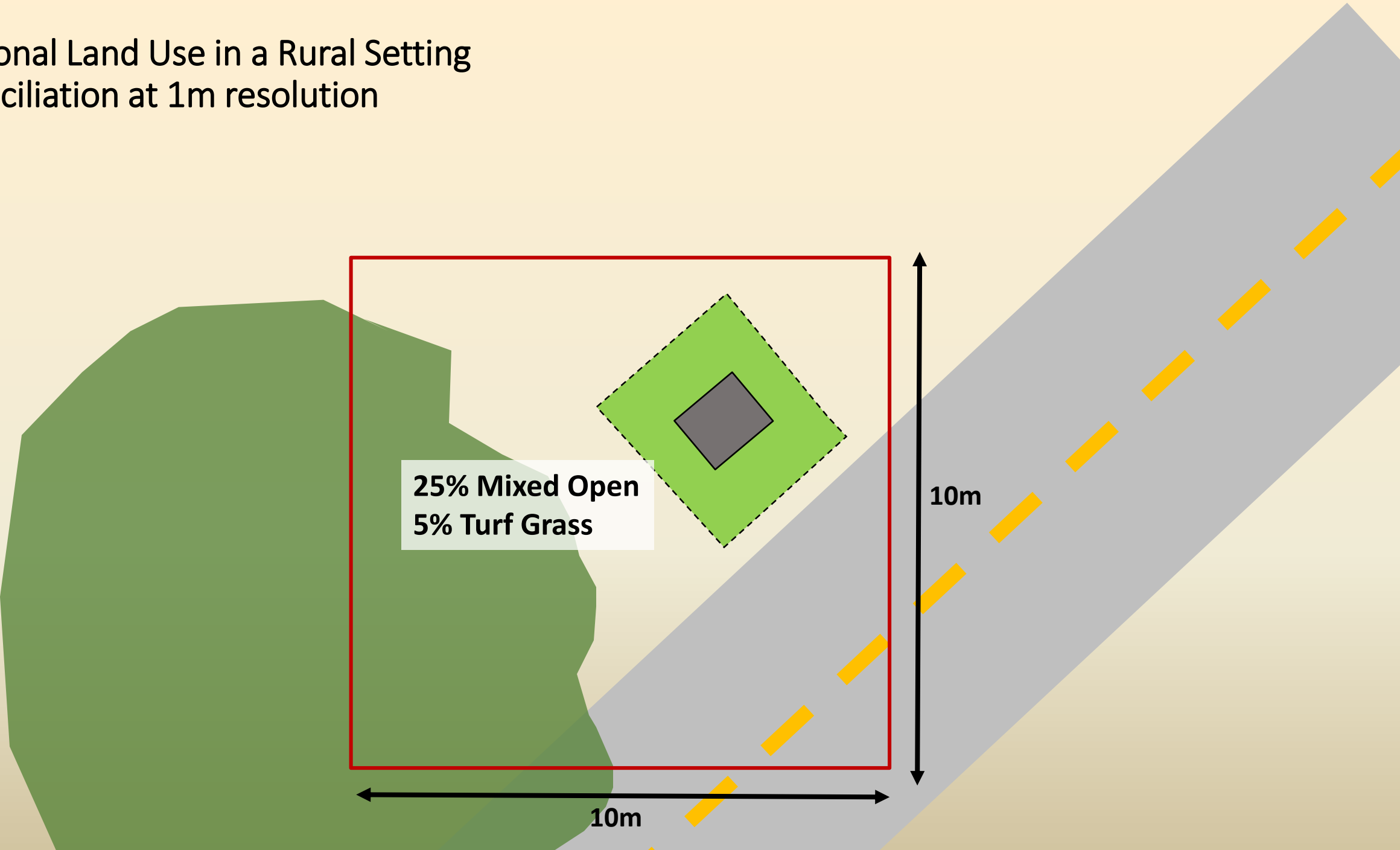
Phase 6 Land Use Development Process 050416 - Modified



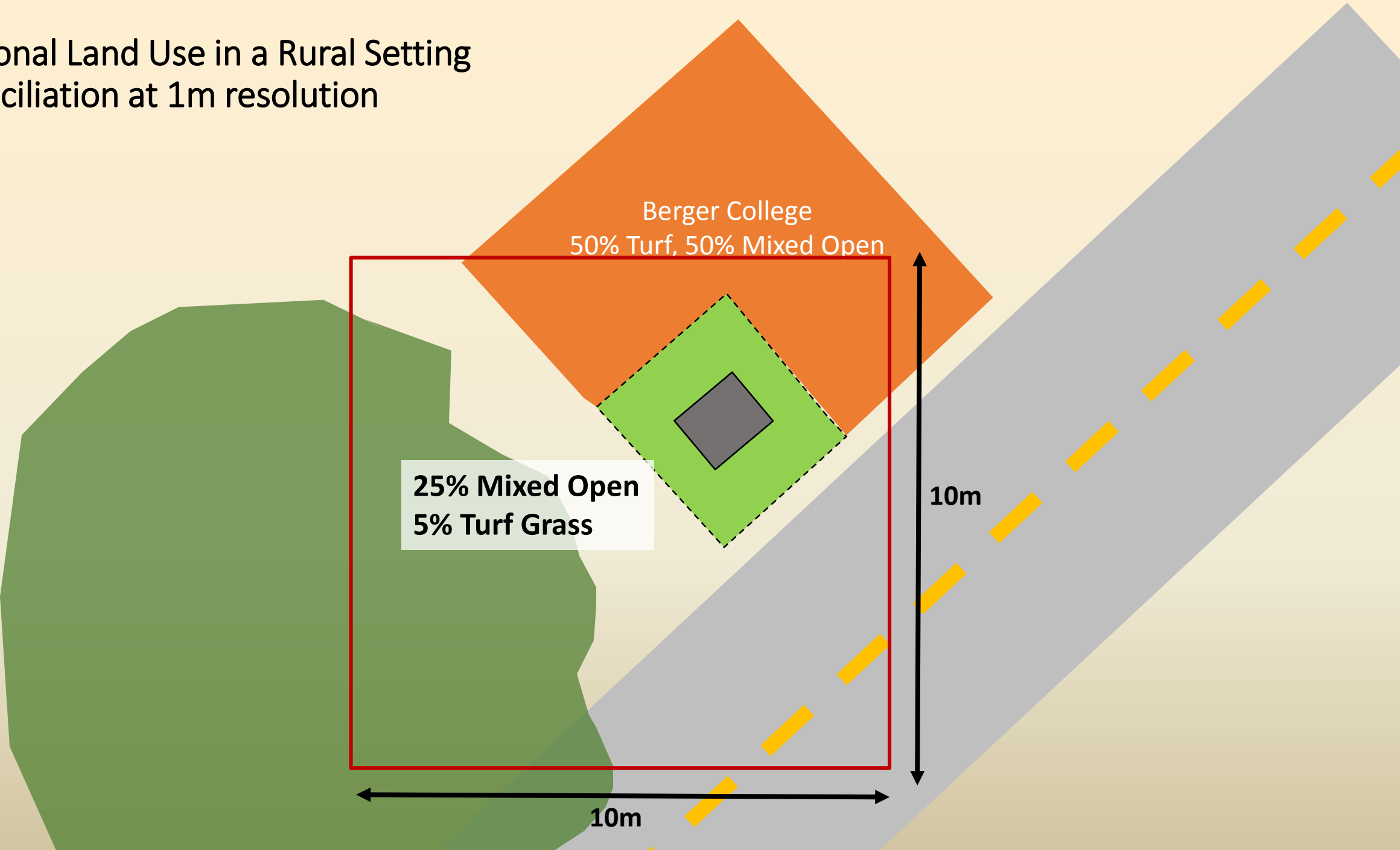
Fractional Land Use in a Rural Setting
Reconciliation at 1m resolution



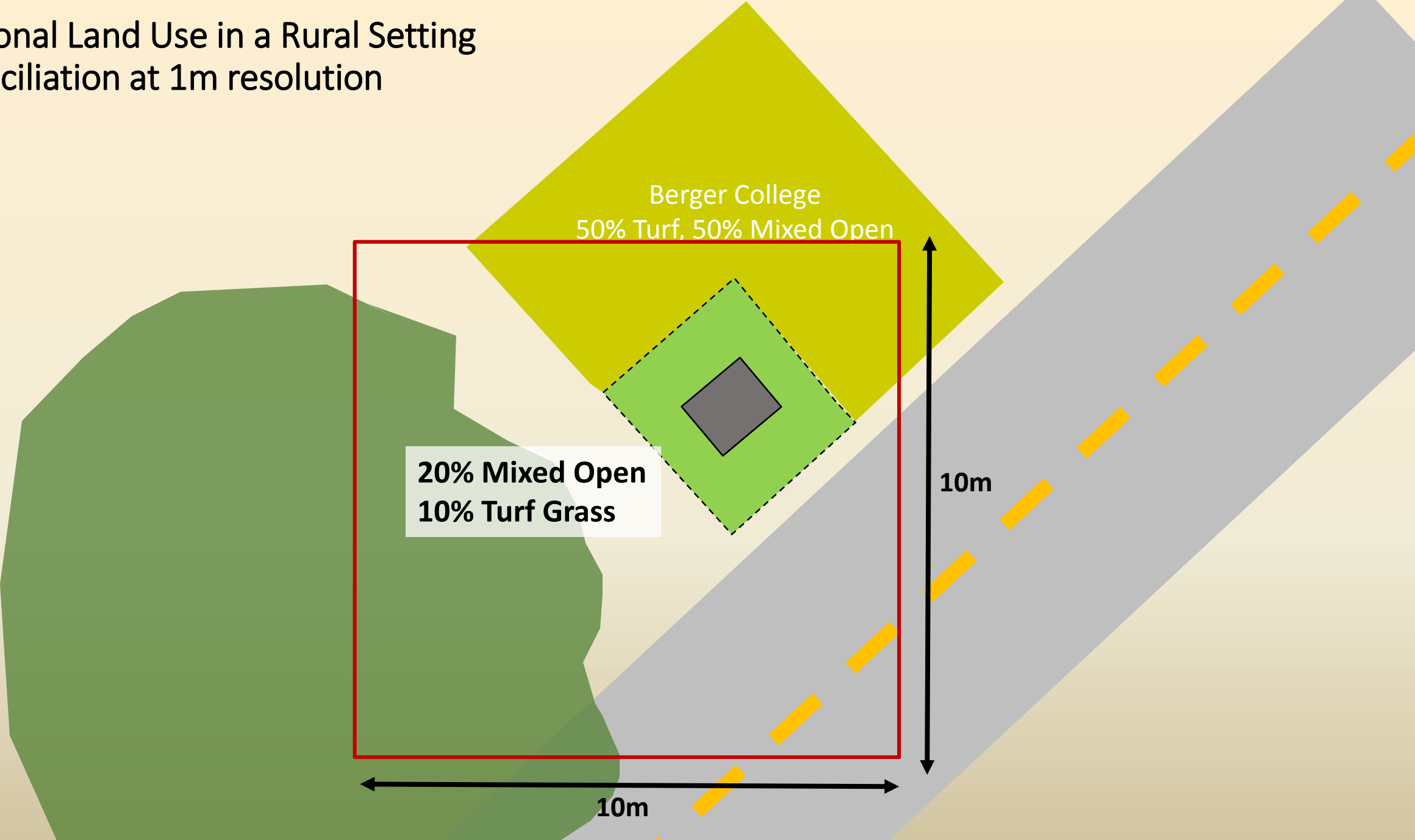
Fractional Land Use in a Rural Setting
Reconciliation at 1m resolution



Fractional Land Use in a Rural Setting
Reconciliation at 1m resolution



Fractional Land Use in a Rural Setting
Reconciliation at 1m resolution



Problem: How to Classify Barren and Low Vegetation Land Cover within different “Land Uses”

Classify as Fractional: Mixed Open/Impervious or Mixed Open/Turf Grass

Class Name	Fraction*	Components	Rationale/Notes
Vehicle Related	TBD	MO:INR	Pervious is likely compacted
Junk/Salvage	TBD	MO:INR	Pervious is likely compacted
Warehouses and Temp. Storage	TBD	MO:INR	Pervious is likely compacted
Industrial	TBD	MO:INR	Pervious is likely compacted
Railyard	TBD	MO:INR	Pervious is likely compacted
Transitional	TBD	MO:INR	Pervious is likely compacted, grass not yet planted
Mixed Urban	TBD	MO:TG	Pervious is minimally maintained
Institutional/governmental	TBD	MO:TG	Pervious is minimally maintained
University/Colleges	TBD	MO:TG	Pervious is minimally maintained
Parks	TBD	MO:TG	Pervious is minimally maintained
Monuments	TBD	MO:TG	Pervious is minimally maintained
Federal Facilities	TBD	MO:TG	Pervious is minimally maintained
Large Developed Parcels	TBD	MO:TG	("Acres" >10 AND "PCT_IMP" >=0.1) – see turf grass methods

* TBD based on analysis from MDE and VA-DEQ