



Conservation Opportunity Area Inventory for the Lower Midwest

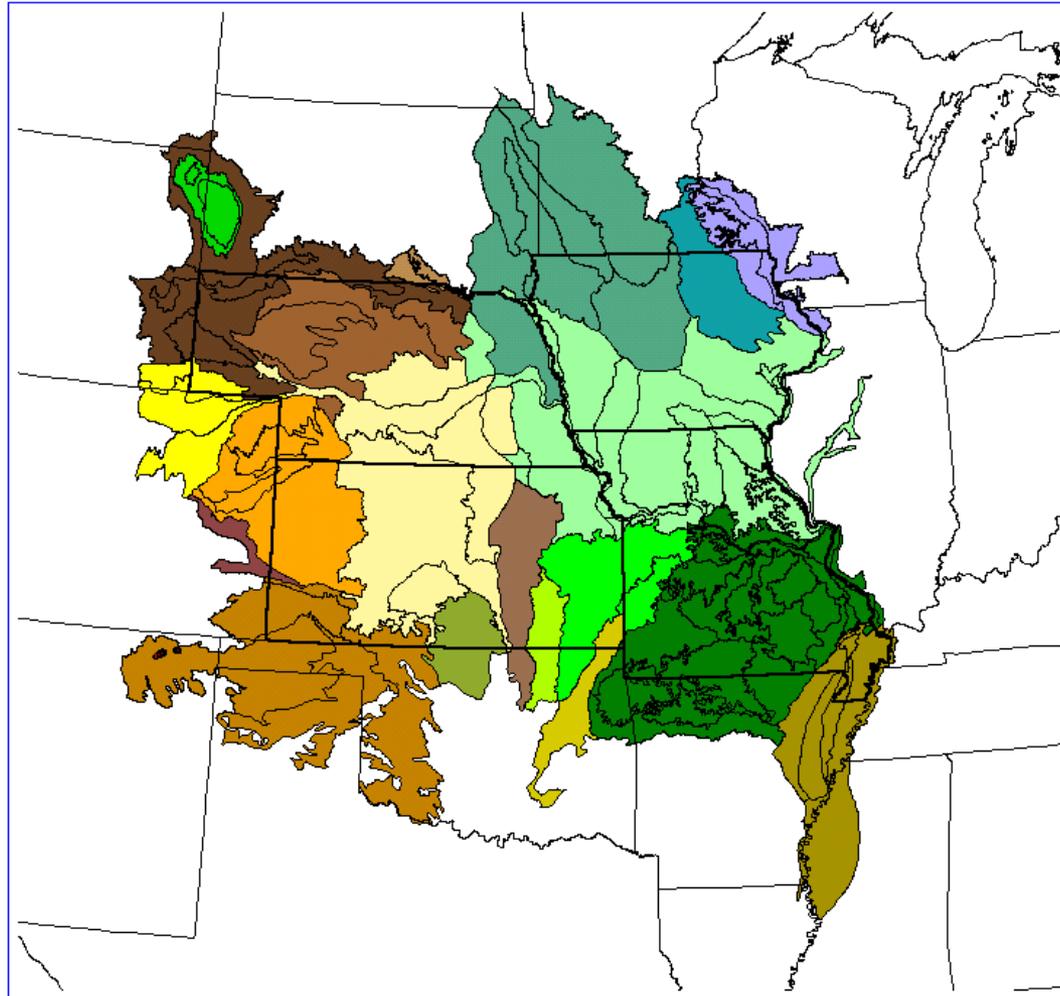
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Missouri Resource Assessment Partnership

www.cerc.usgs.gov/morap



Study area: all ecological subsections that intersect IA, KS, MO, and NE



Conceptual Underpinnings

- Conservation will be accomplished at many resolutions by different entities, so results need to be easy to understand and flexible but all efforts should fit within a larger resolution design
- Conservation of enduring features is a primary goal, so analyses are by landform type within ecological subsection
- Two questions
 - Are there good opportunities to conserve all enduring features of all subsections?
 - Given the good opportunities that do exist, how do we set priorities for action?

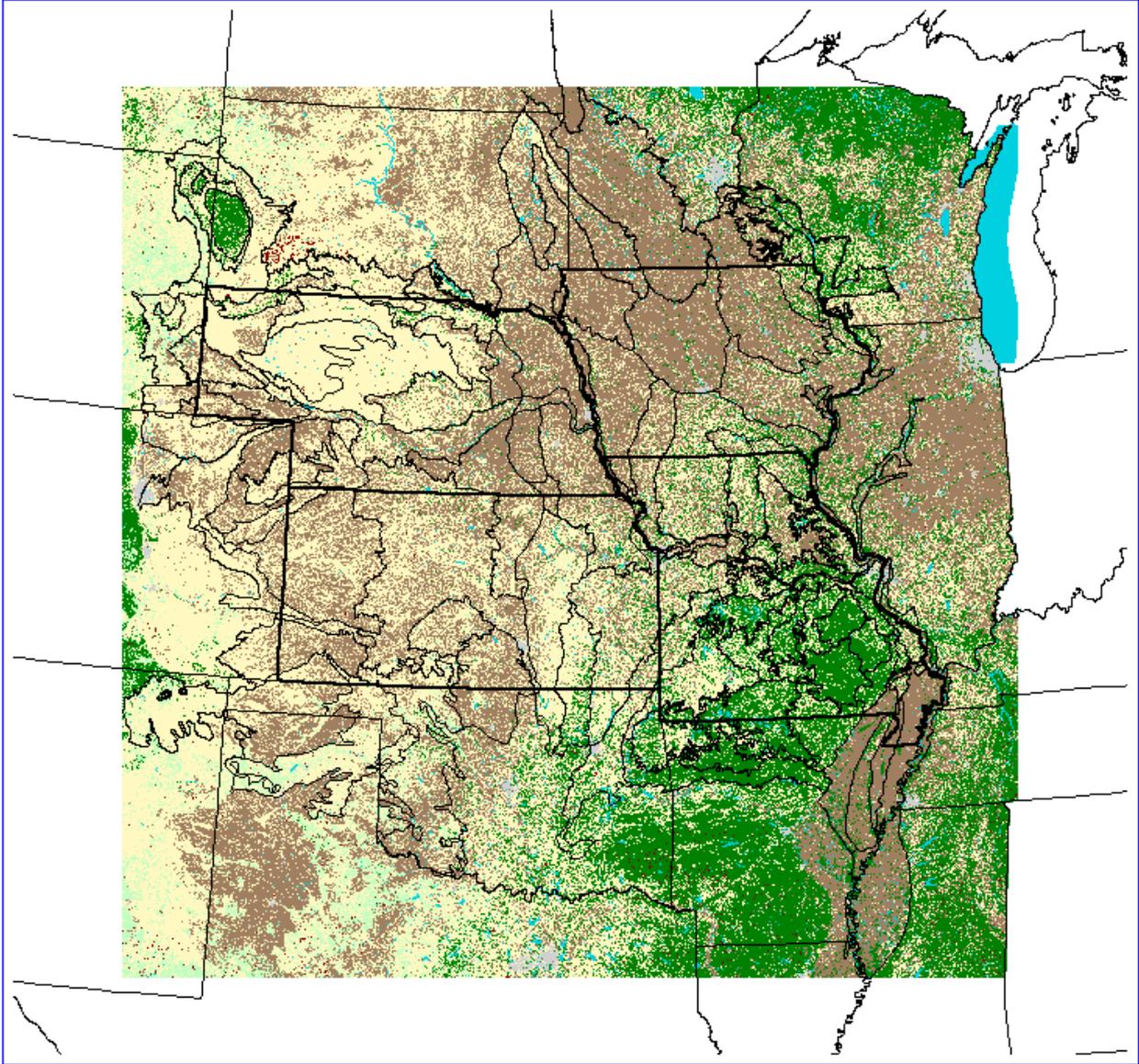


Basic Methods: GIS Analyses of Nationally-available Data Layers

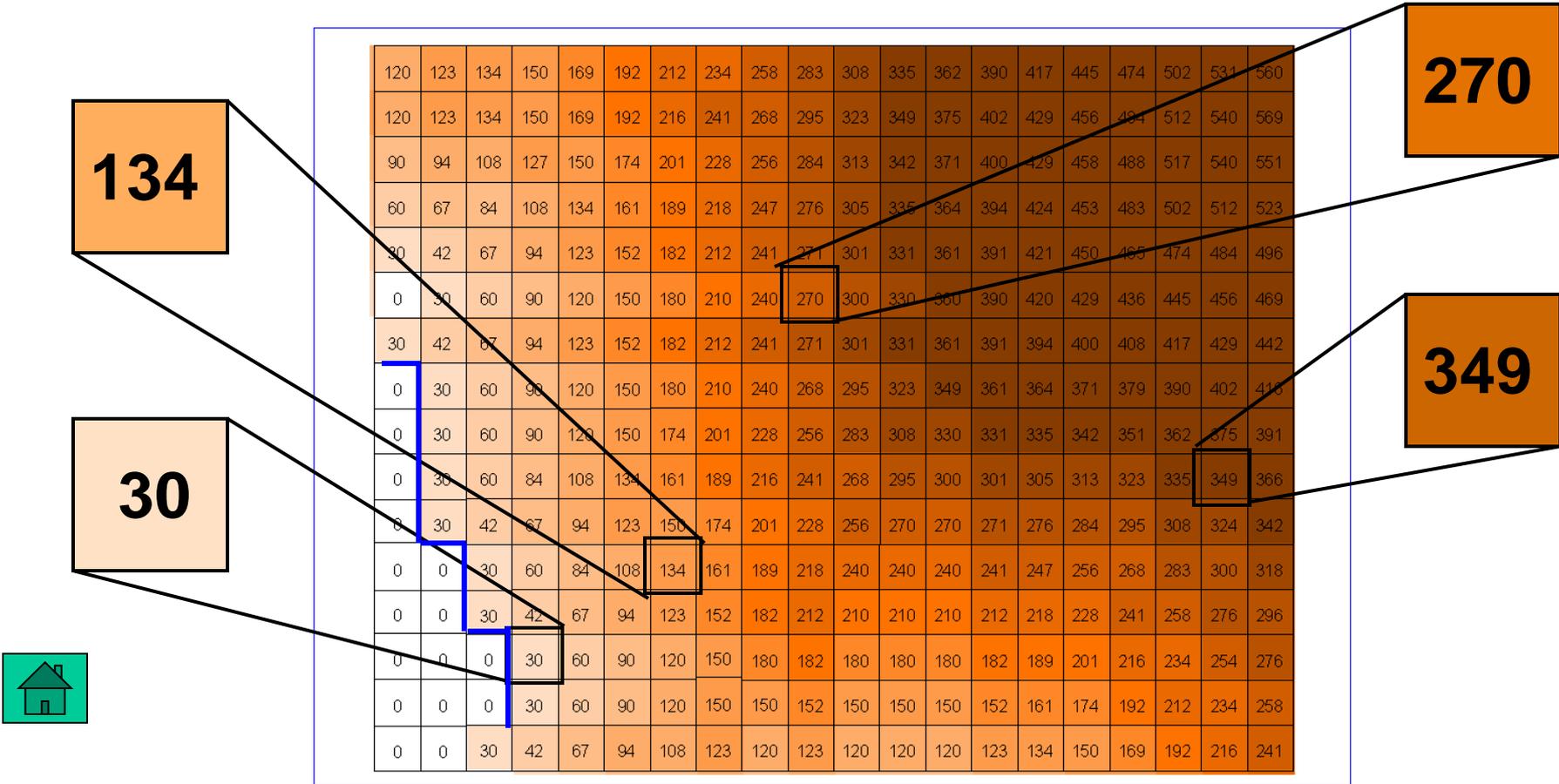
- Create distance grids for land cover patches and for roads (input from National Land Cover Database and TIGER road files)
- Model landforms (input from National Elevation Database)
- ‘Stack’ road and land cover patch distance grids to identify conservation opportunity areas (OAs)
- Overlay OAs with landforms within each ecological subsection to create OA Groups - land cover patches on similar landforms - for further analysis (preserve design; added variables; etc.)



Land Use / Land Cover from NLCD



Distance grid surface values (30 meter grid)

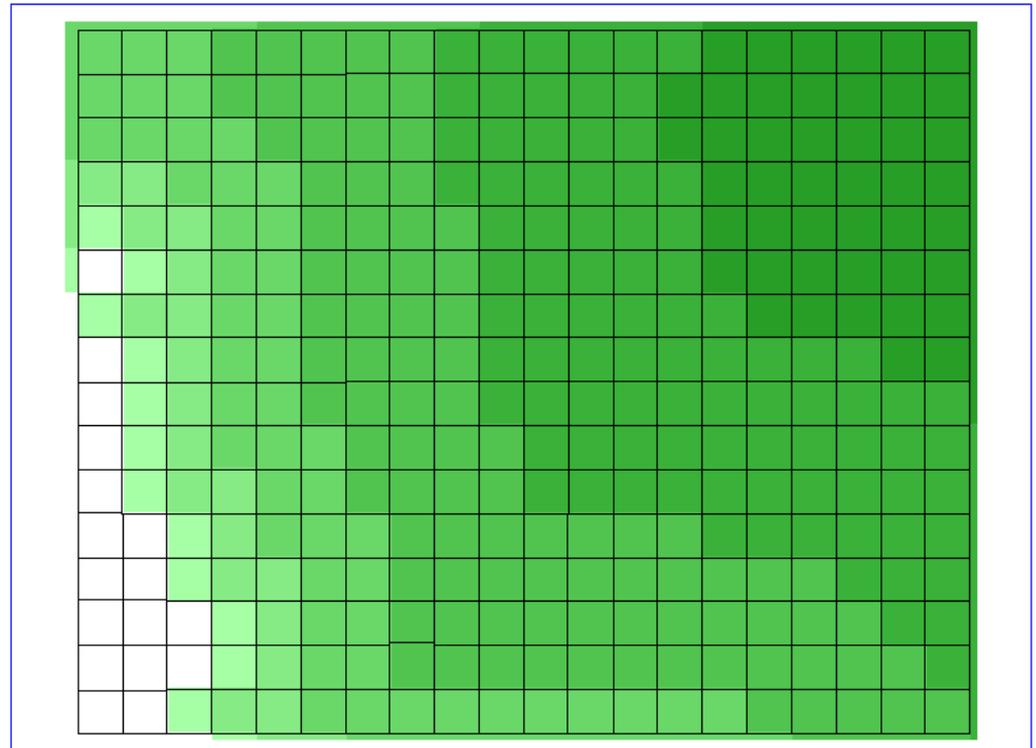


Distance of each forest pixel from the edge of forest

Assign grid cells a value from 0 to 9 based on distance from land cover patch edge or distance from road

Distance values

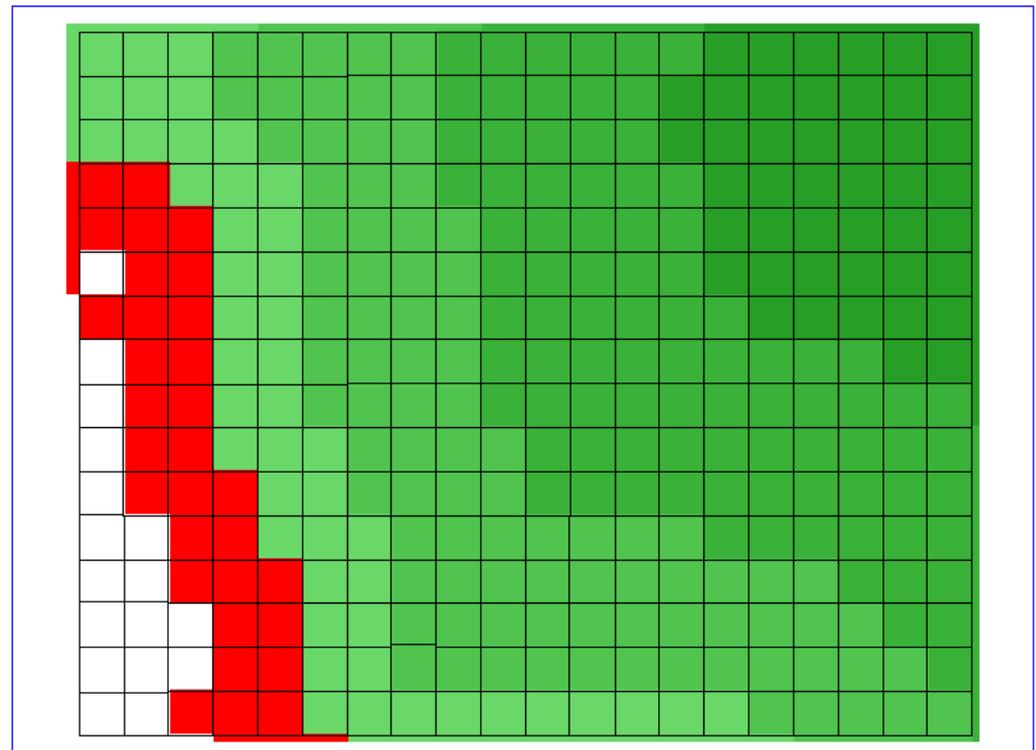
	0: Non-forested
	1: 1 - 30 meters
	2: 30 - 75 m
	3: 75 - 142.5 m
	4: 142.5 - 243.75 m
	5: 243.75 - 395.6 m
	6: 395.6 - 623.4 m
	7: 623.4 - 965.1 m
	8: 965.1 - 1,477.7 m
	9: >1,477.7 m



Assign grid cells a value from 0 to 9 based on distance from land cover patch edge or distance from road

Distance values

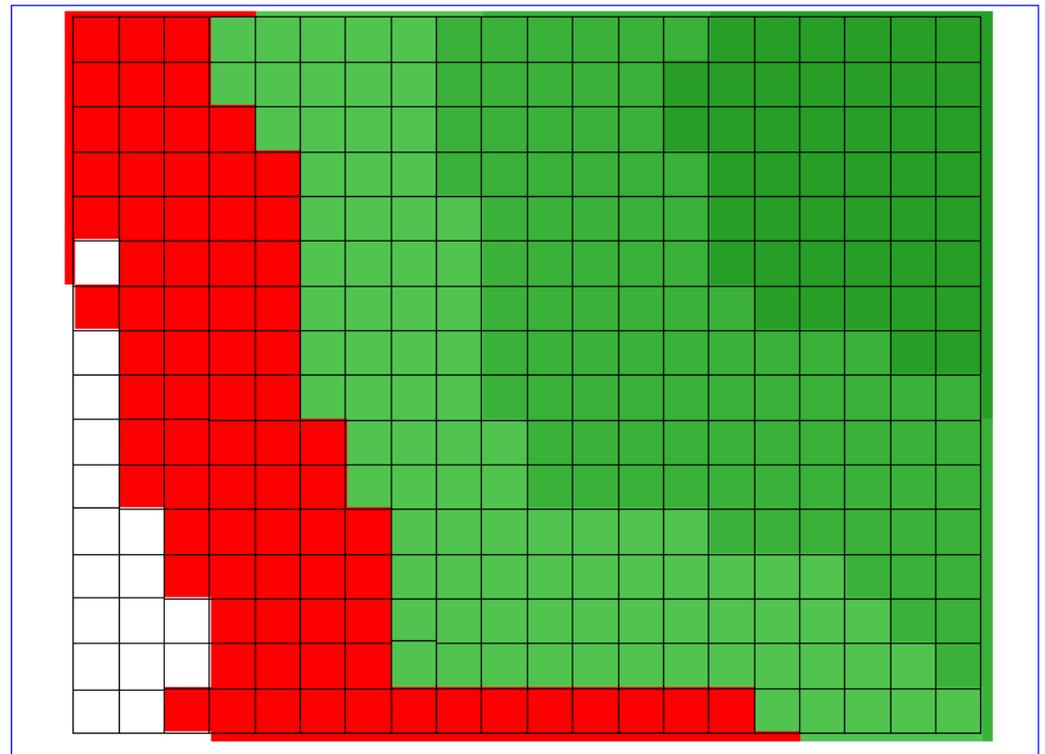
	0: Non-forested
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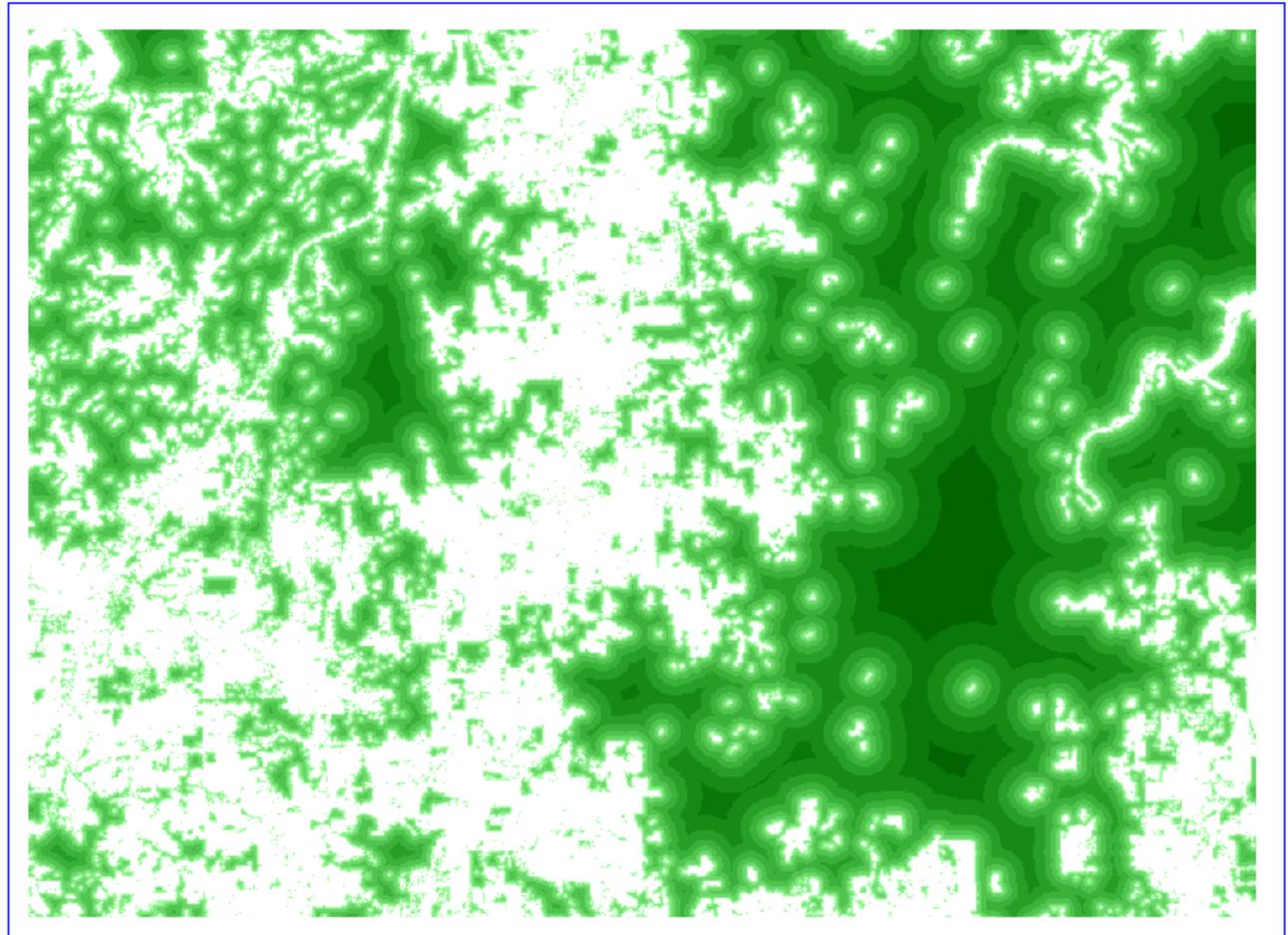
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Result: a new forest grid with cell values 0 to 9 based on distance to the forest edge

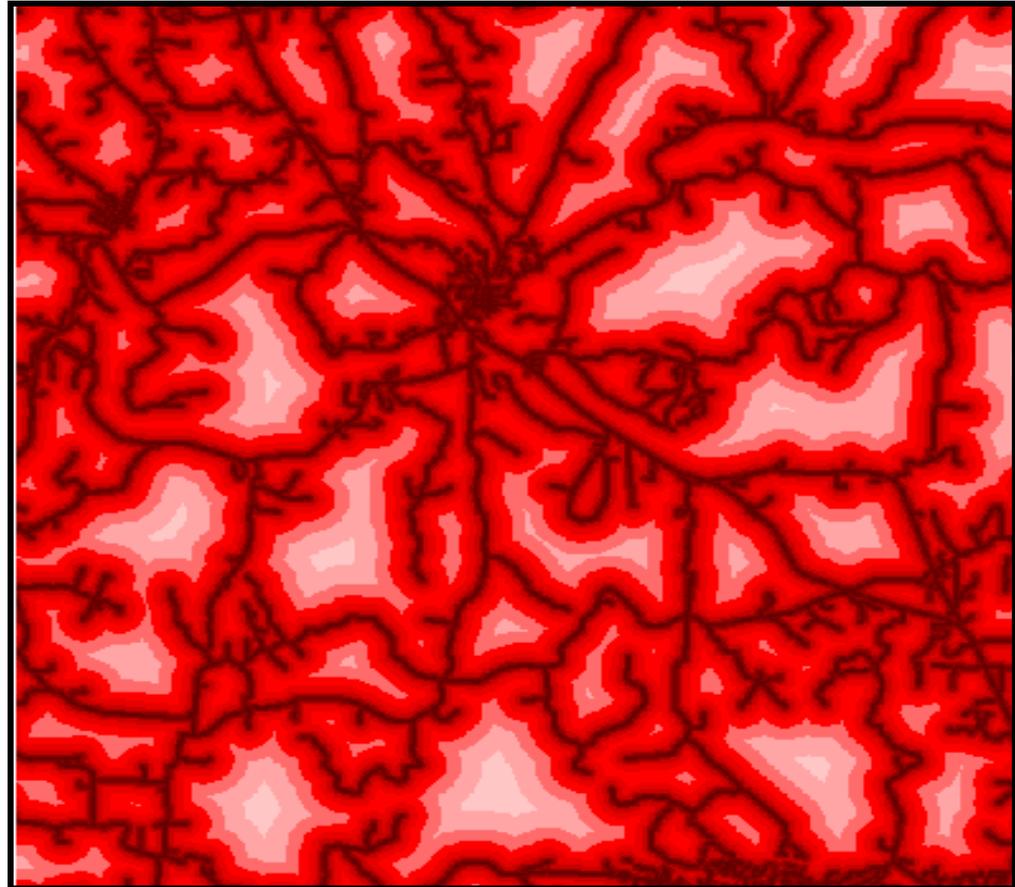
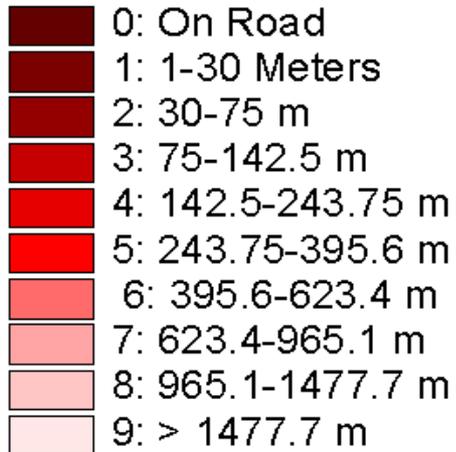
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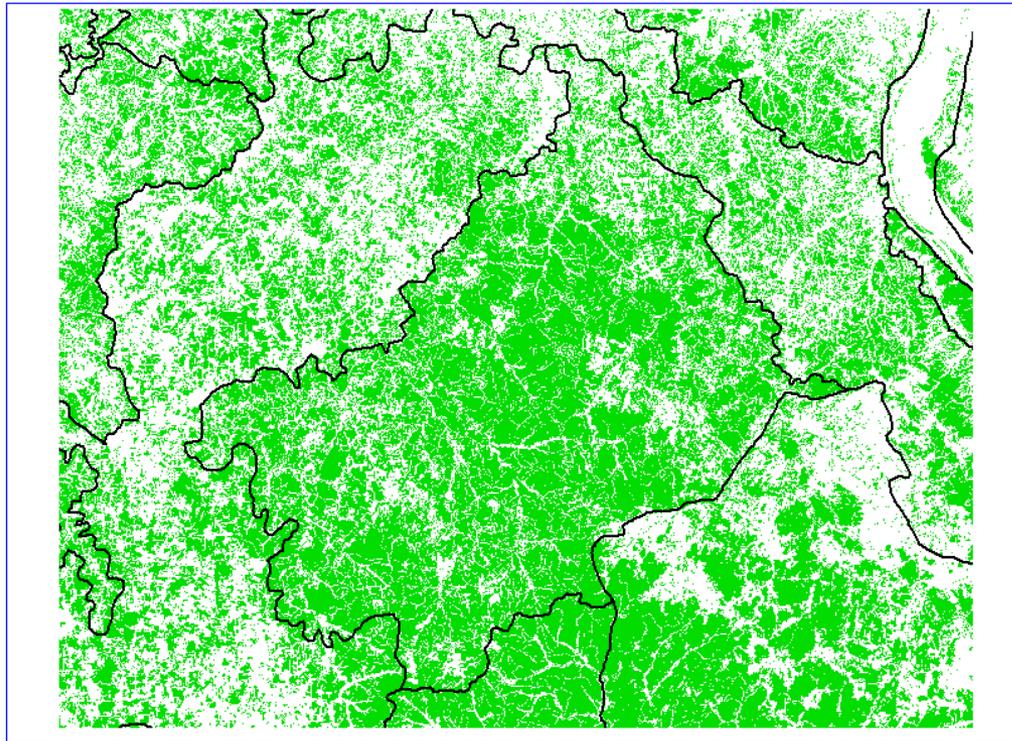
Merged Road Distance Values

Distance from Roads

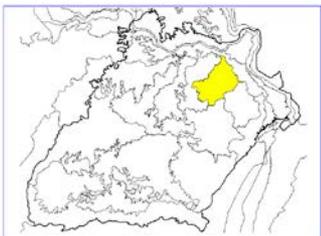


Opportunity Areas resulting from *flexible* criteria

Selection Model: Forest ≥ 2 Roads ≥ 2

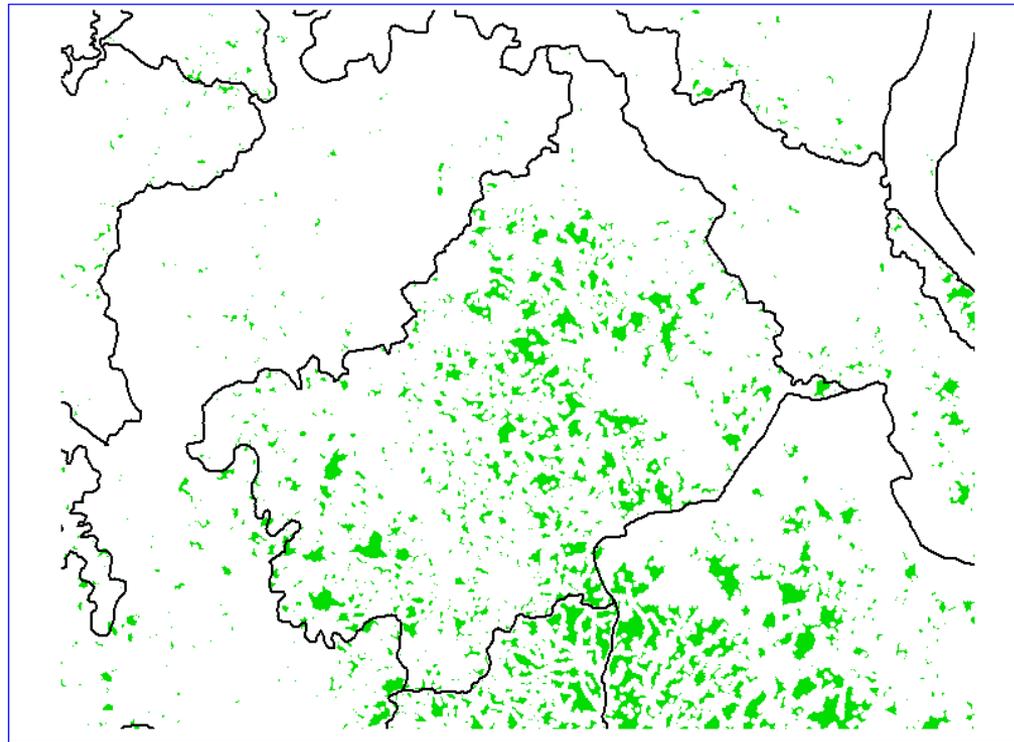


Close to forest edge and close to roads

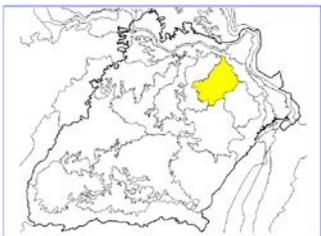


Opportunity Areas resulting from *flexible* criteria

Selection Model: Forest ≥ 6 Roads ≥ 6



Mid-distance from forest edge and roads



Landform modeling: an enduring features data layer

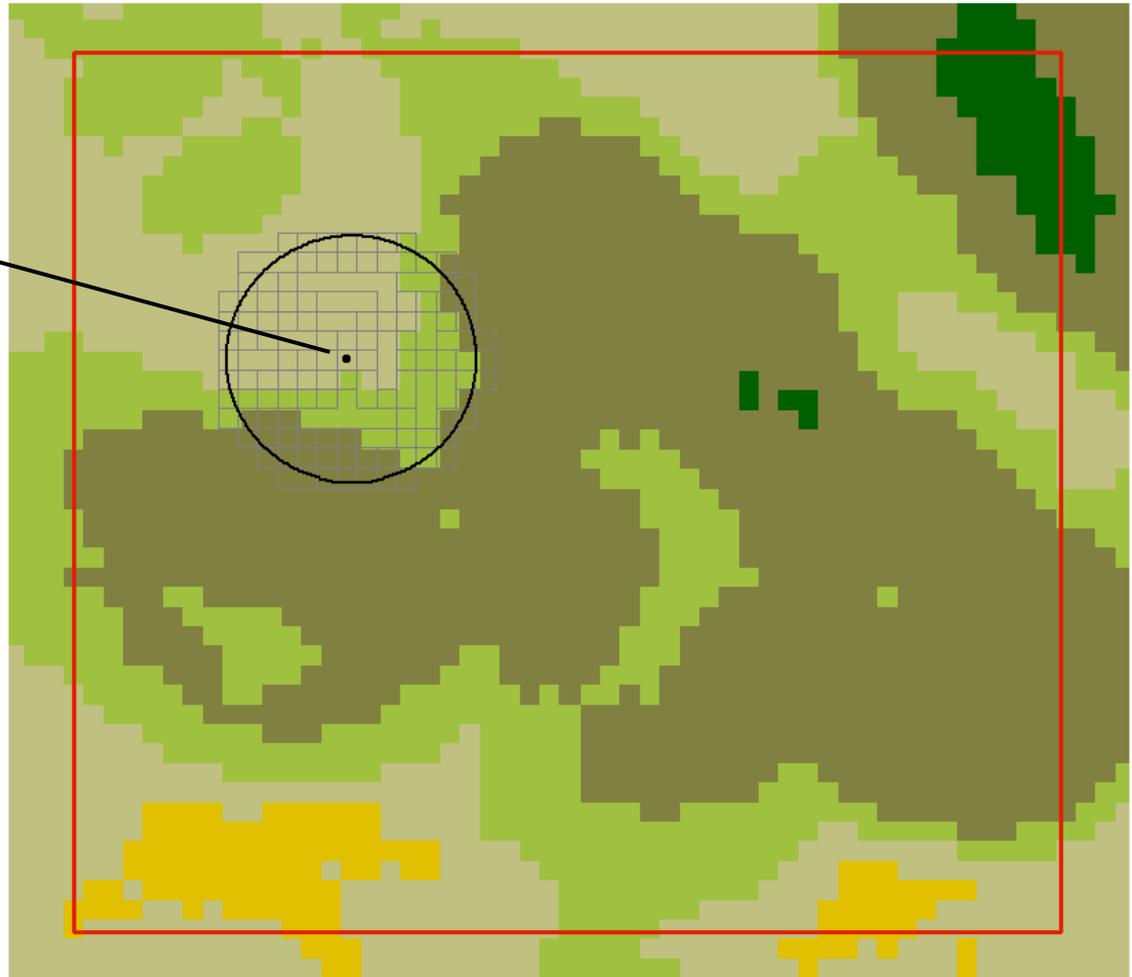
Slope + Relief = Landform

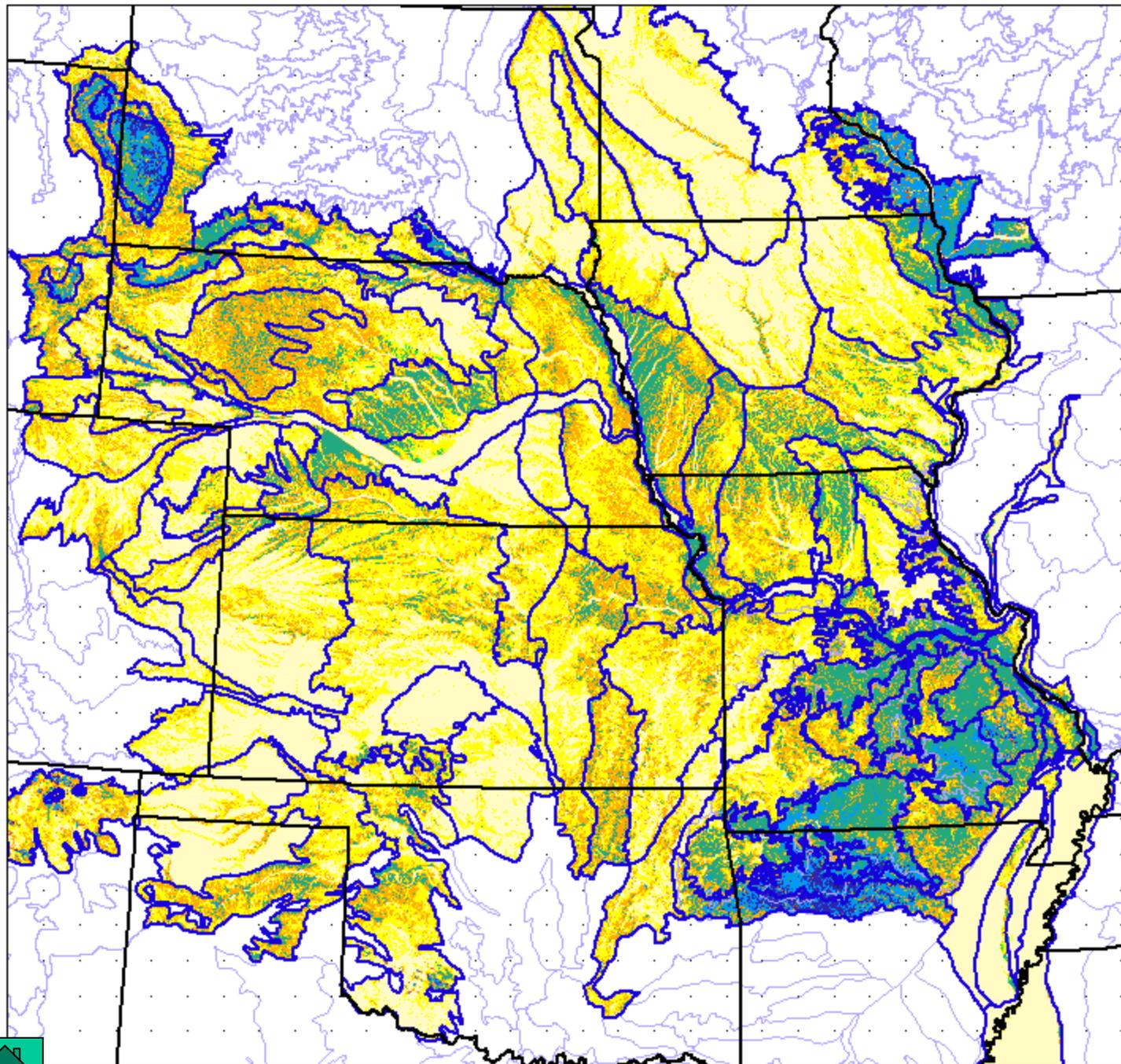
**Derived from Neighborhood Analysis of
Digital Elevation Models (DEMs) – National
Elevation Database files used for basic input**



Neighborhood analysis example: the elevation range surrounding the center cell is relief

Total relief within the circle is the difference between highest and lowest cell

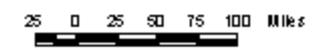
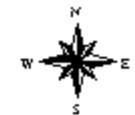




Landforms of Central USA

Landforms were created from USGS 30-meter DEM's. The numeric code represents slope and relief. If more than 50% of the neighborhood is gently sloping, then the first digit is 1. If less than 50% of the neighborhood is gently sloping, then the first digit is 2. Relief, or the range of elevation in the neighborhood, is broken into six classes with 1 representing the least relief.

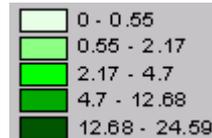
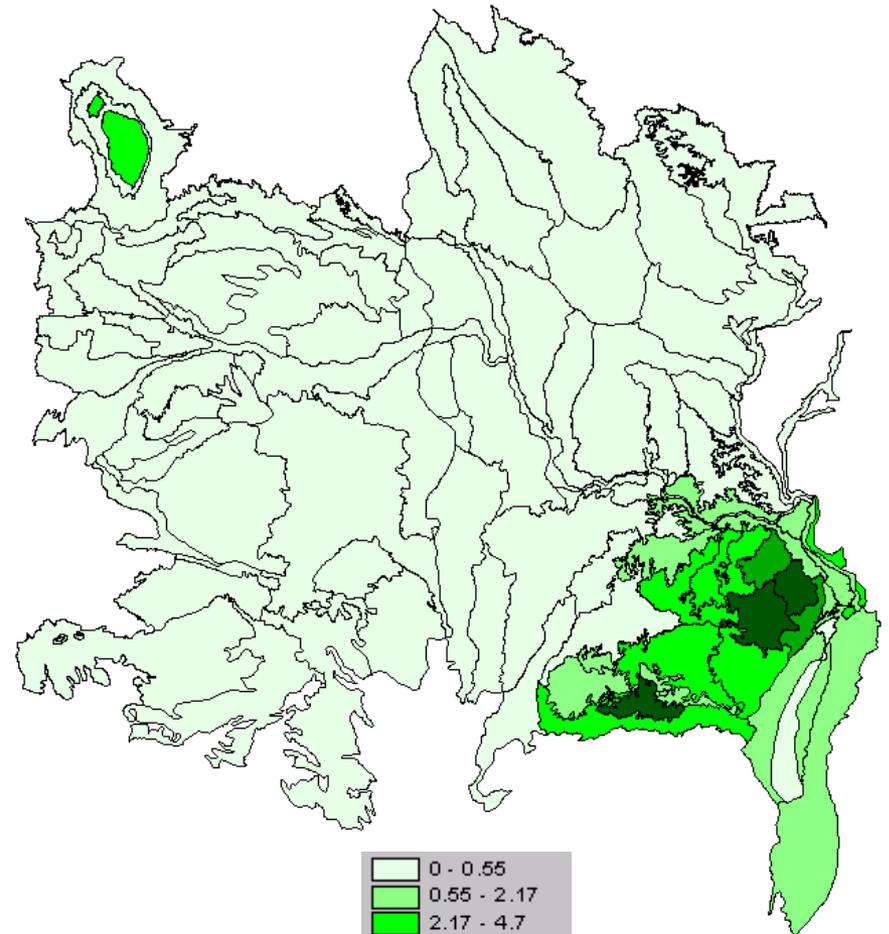
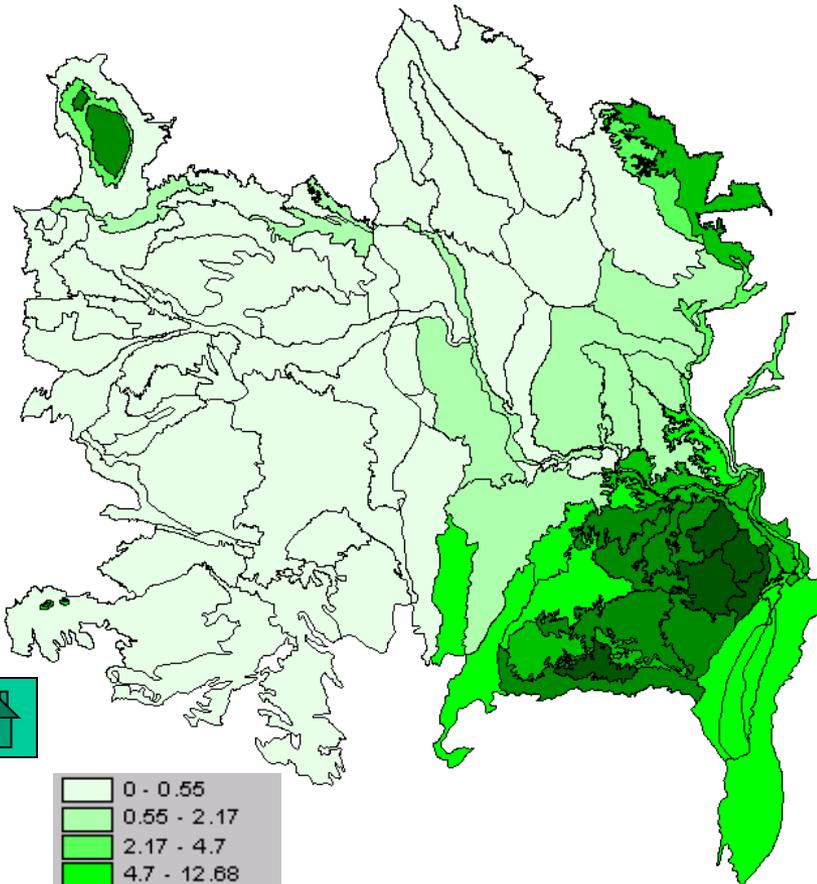
-  Bailey's Ecoregions
- Landforms**
-  11 Flat Plains
-  12 Smooth Plains
-  13 Irregular Plains
-  14 Plains with Low Hills
-  15 Plains with Hills
-  16 Plains with Low Mountains
-  22 Rugged Plains
-  23 Breaks
-  24 Low Hills
-  25 Hills
-  26 Low Mountains



Percent of Forest Opportunity Areas by Subsection

Forest ≥ 3 , Roads ≥ 3

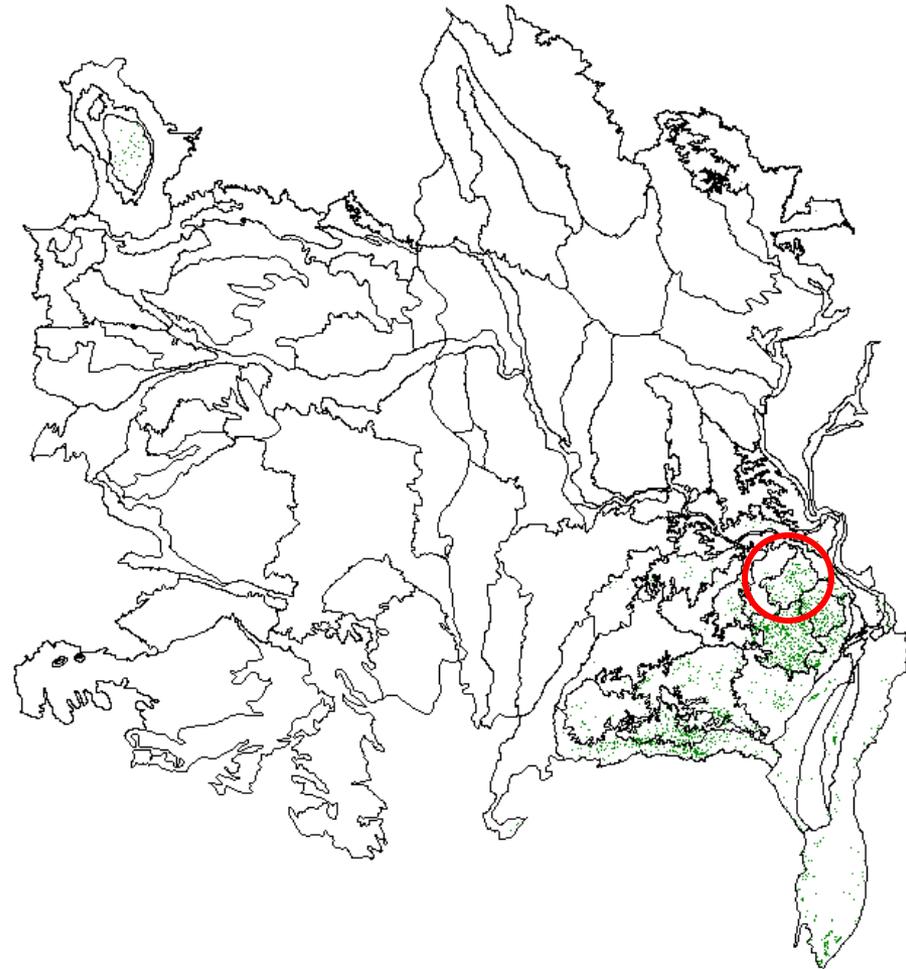
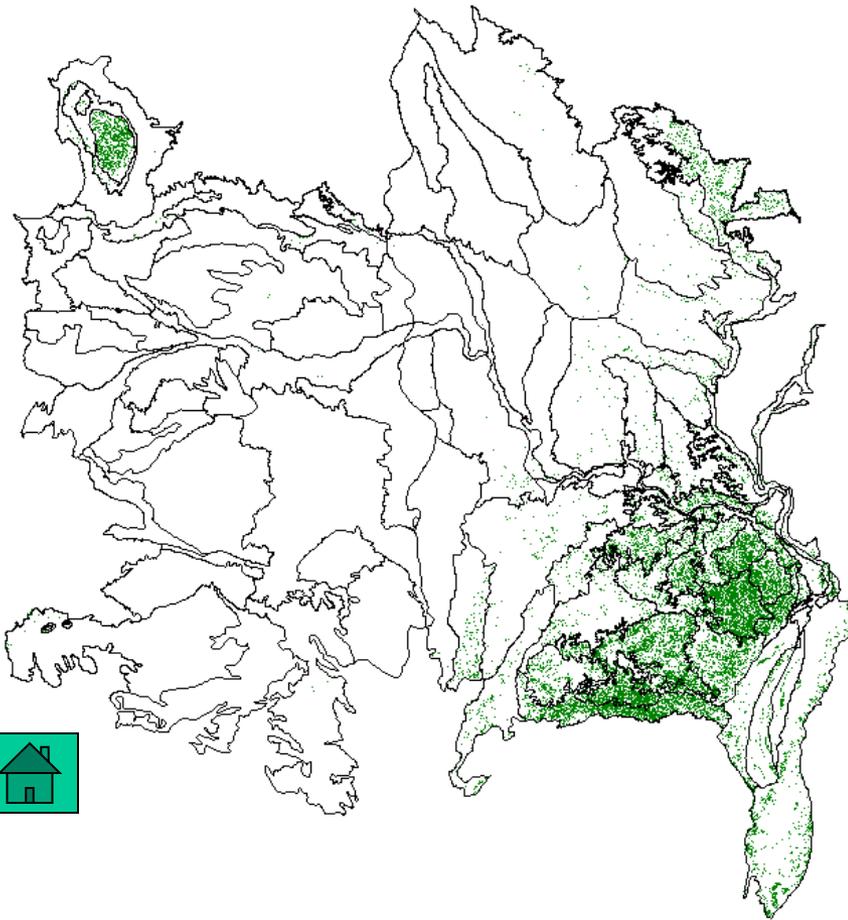
Forest ≥ 6 , Roads ≥ 6



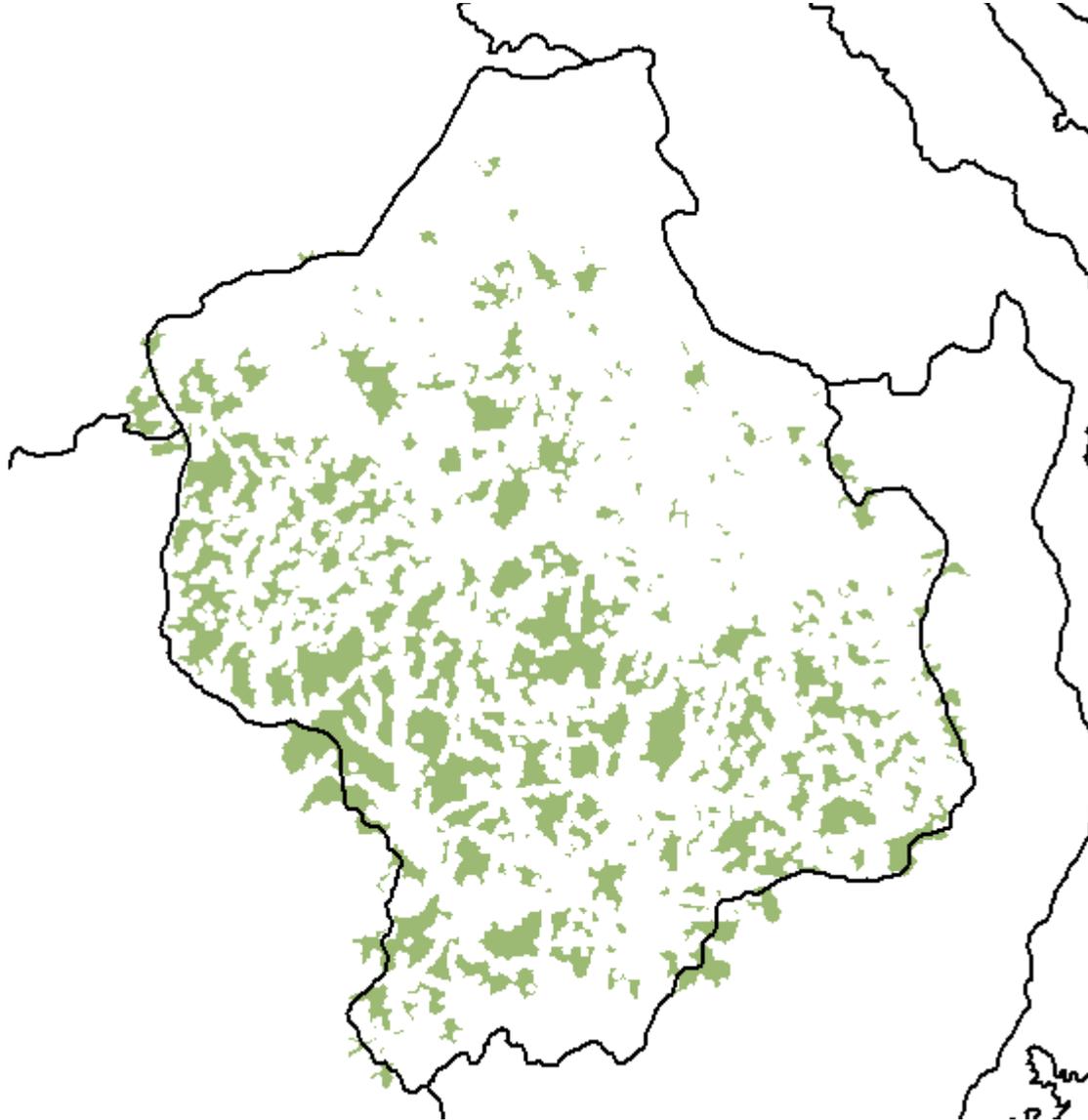
Forest Opportunity Areas by Subsection

Forest ≥ 3 , Roads ≥ 3

Forest ≥ 6 , Roads ≥ 6

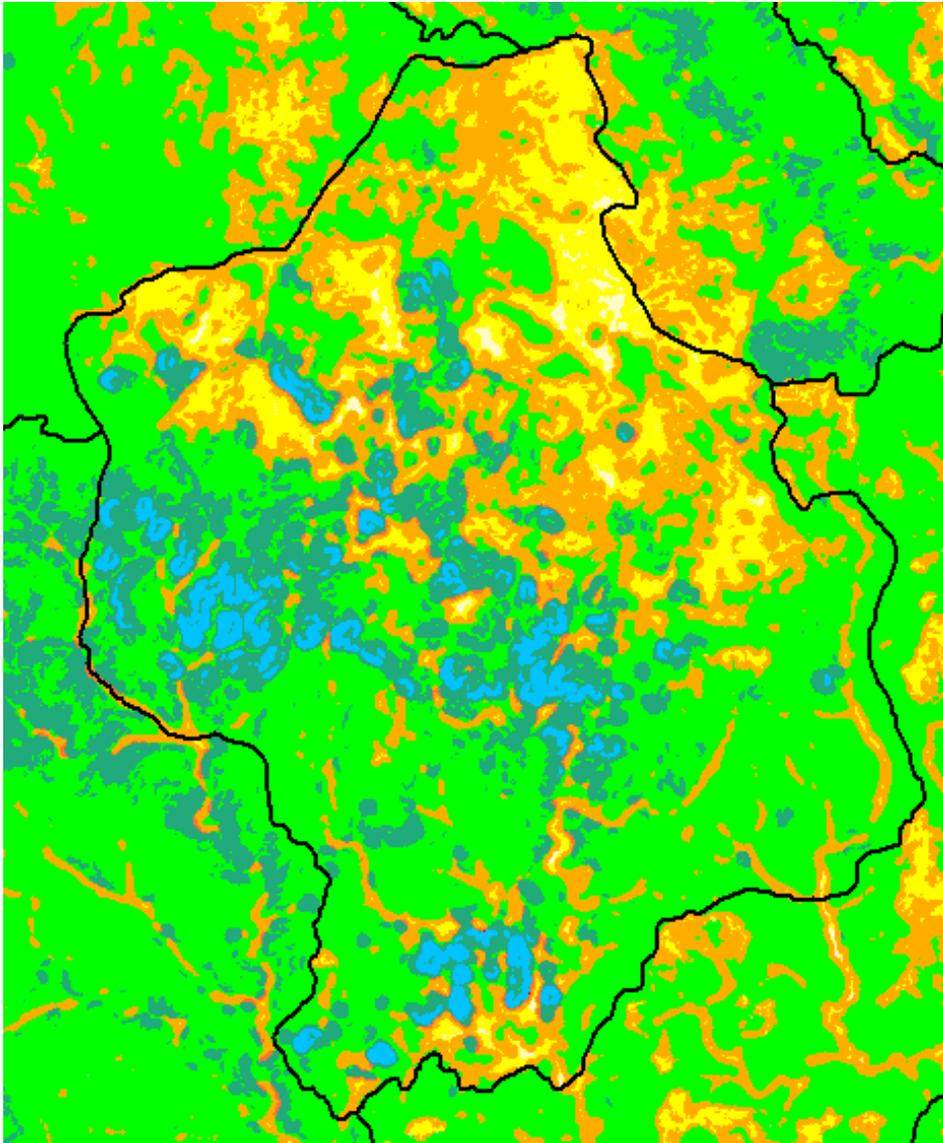


Forest Opportunity Areas (6,6) St. Francois Knobs and Basins

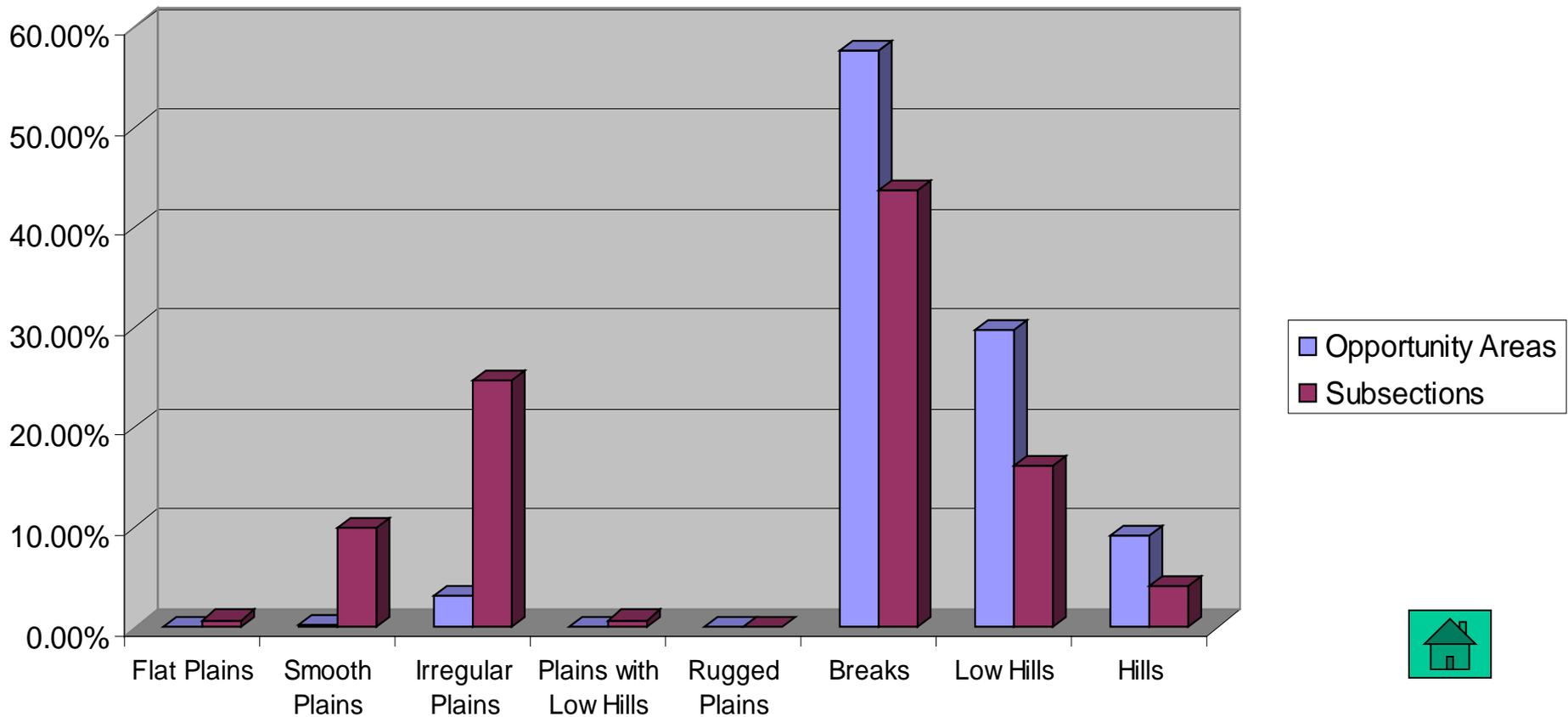


Landforms

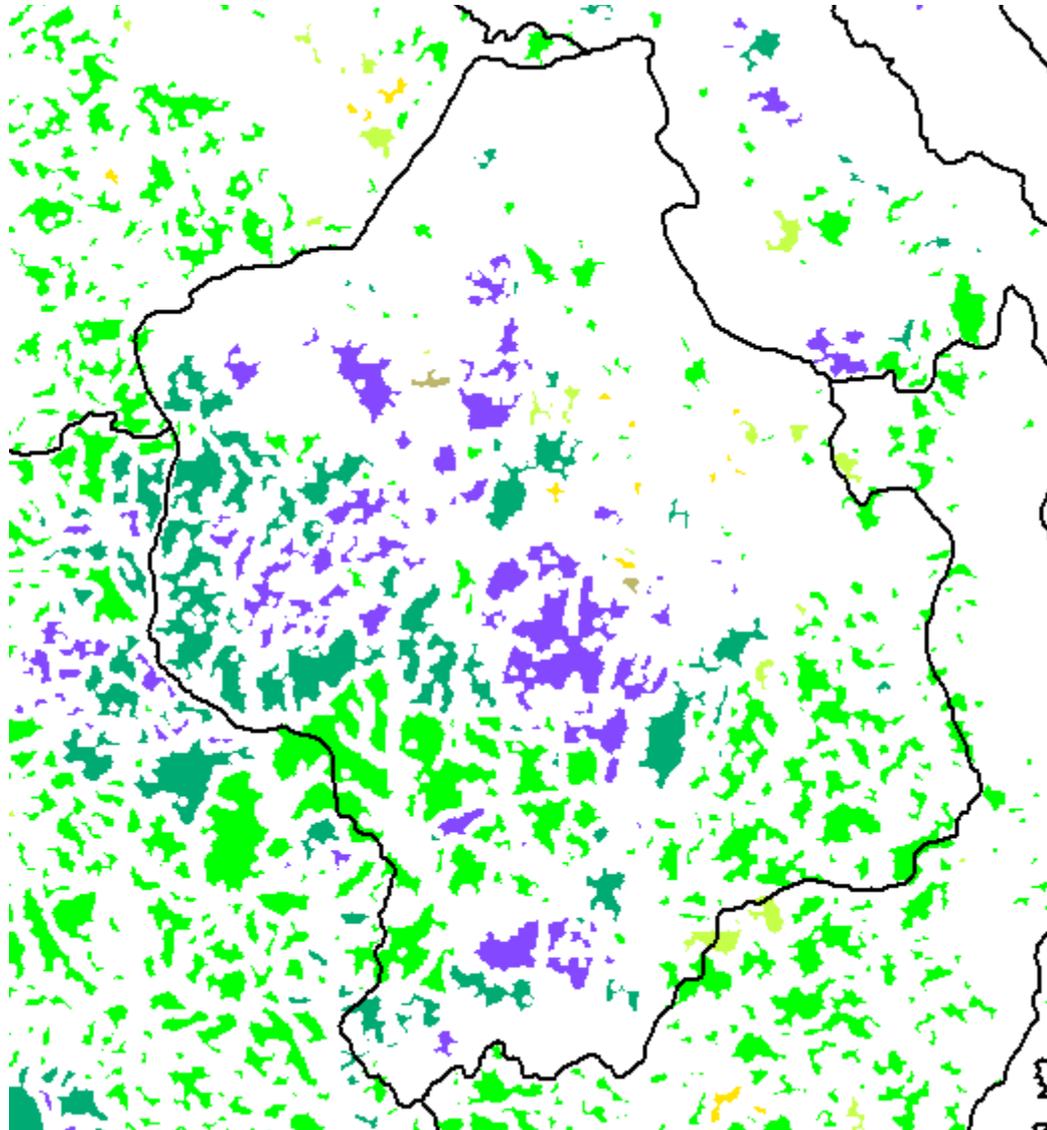
St. Francois Knobs and Basins Subsection



Landform Representation by OA



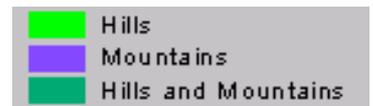
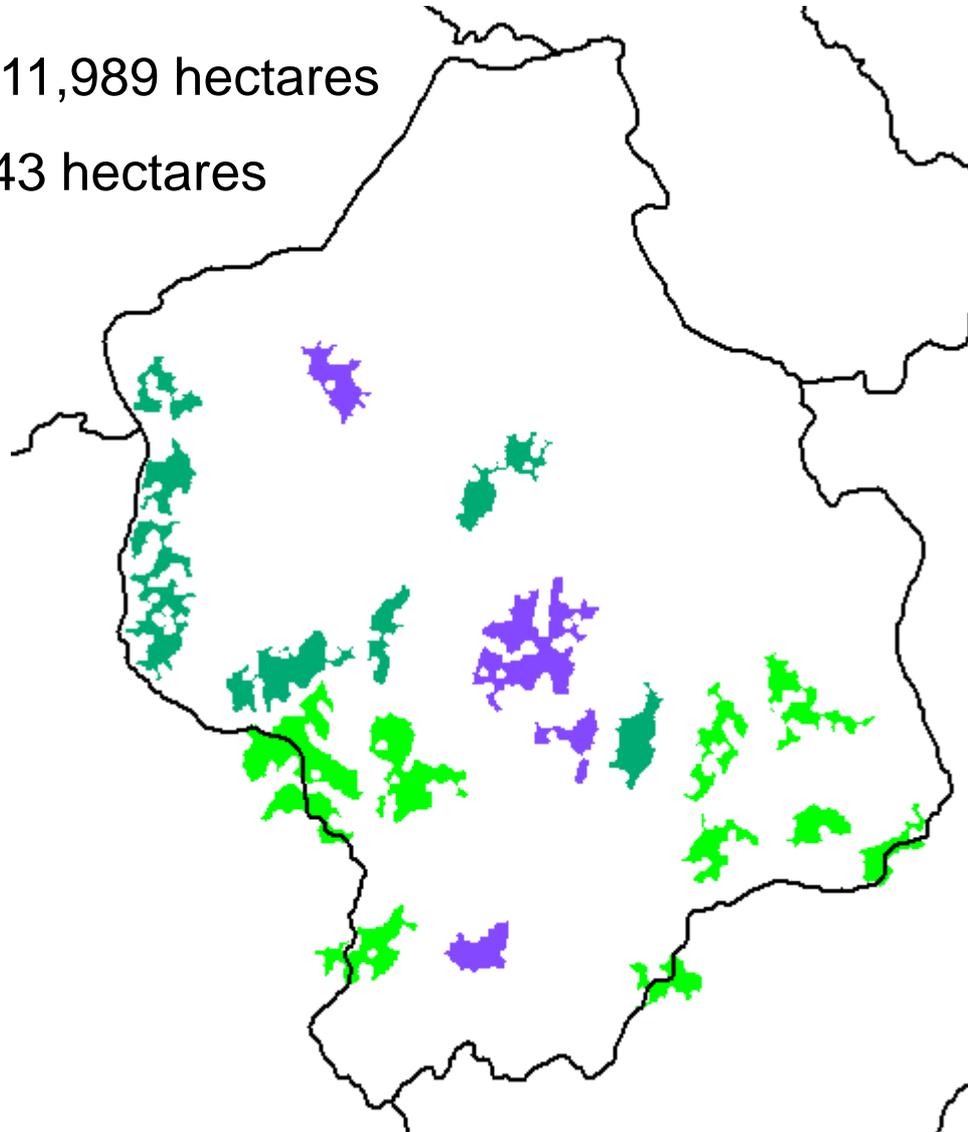
Forest Opportunity Area Groups by Landform Type



Model 1: Conserve 10% of the Subsection (Viewed by OA Group)

Subsection – 411,989 hectares

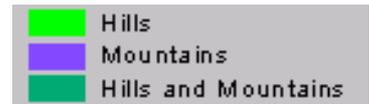
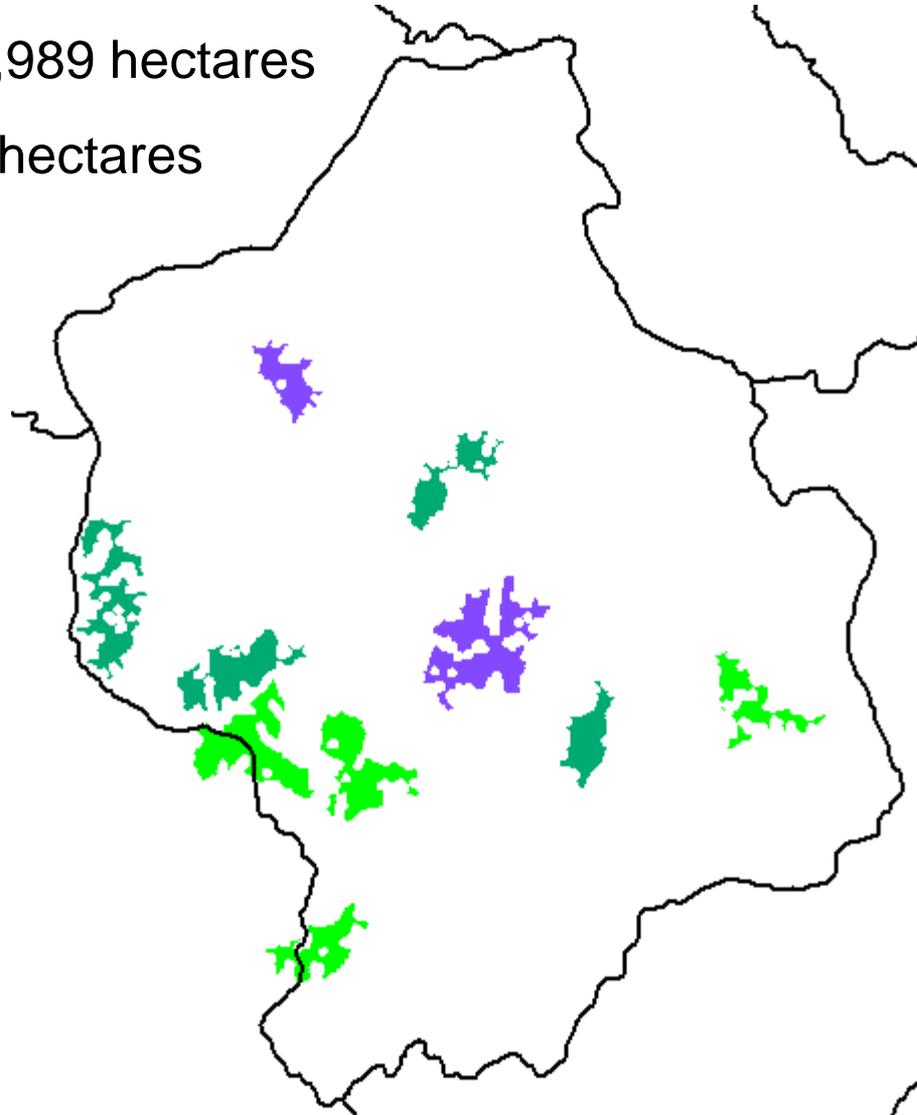
21 OAs – 41,843 hectares



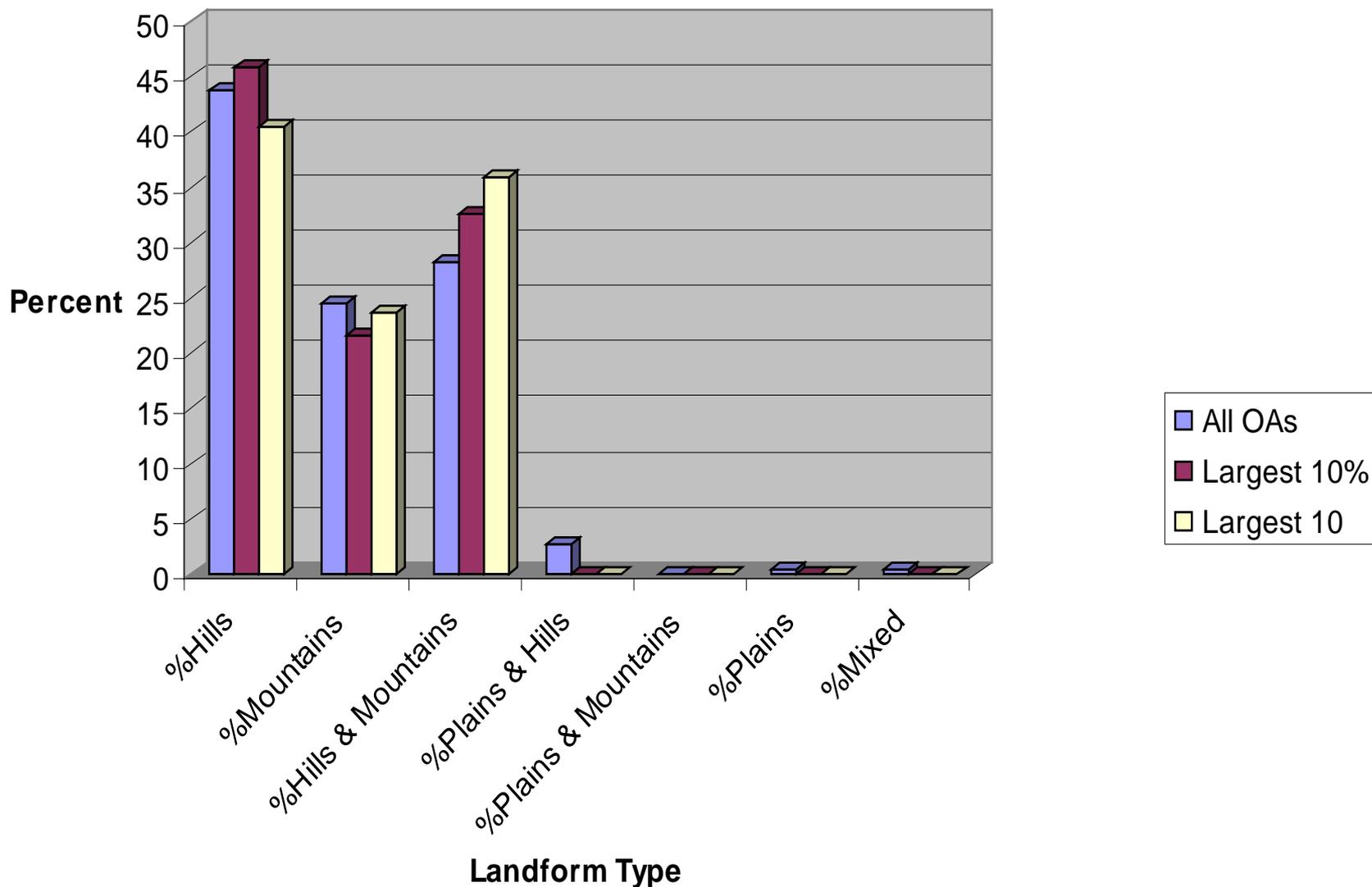
Model 2: Top 10 Largest OAs (Viewed by OA Group)

Subsection – 411,989 hectares

10 OAs – 27,402 hectares



OA Group Representation by Target Conservation Selection Model



Summary

- We identify conservation opportunity areas and attempt to capture all major landforms within each ecological subsection
- Key steps include the use of national data bases to create distance grids for land cover patches and roads, plus landform models
- Data layers are presented in an easy to understand, flexible format to facilitate use by many entities, and to enable fine-resolution analyses
- We hope this analysis will provide the framework for coordinated action by a variety of groups (local, state, federal, private)



Announcement: Landscape Planning for Conservation: State-based and Ecoregion Based Initiatives (April 26, 2002)

A special session during the Landscape Ecology Meetings in Lincoln, NE

Contact: David Diamond

Missouri Resource Assessment Partnership

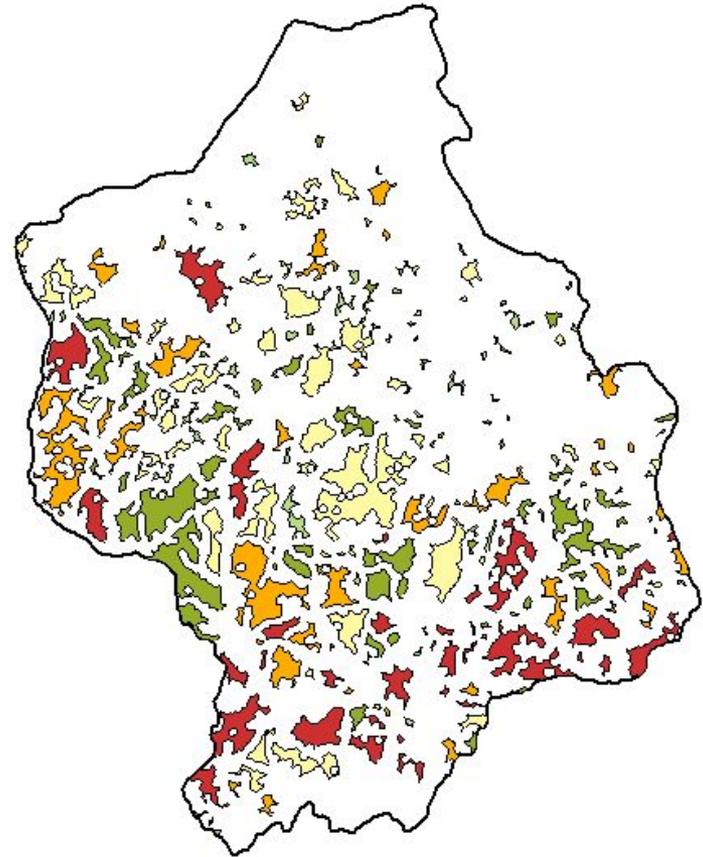
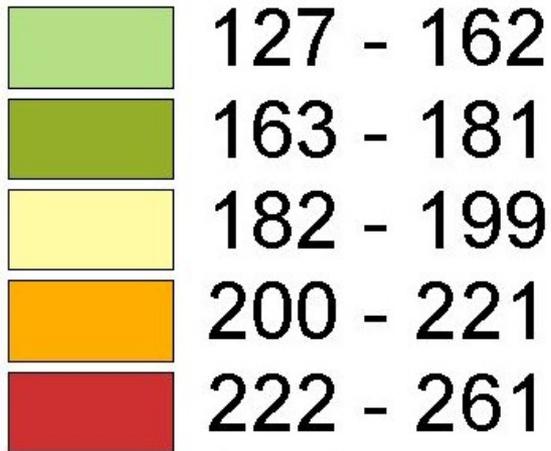
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David_Diamond@usgs.gov

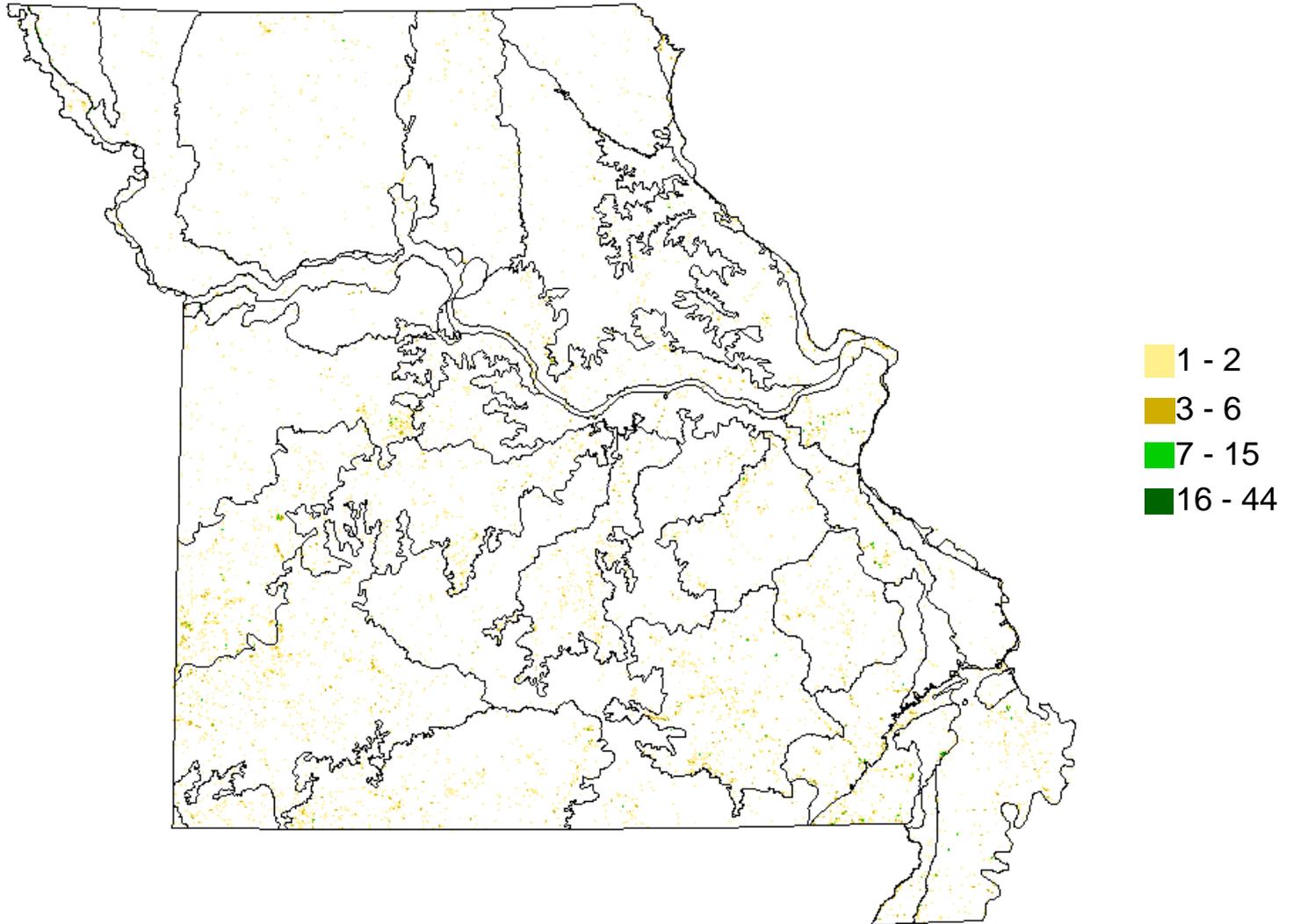


Total vertebrate count by OA (OAs contain 97% of all vertebrates in subsection, and 89% of all in Missouri)

Total No. Vertebrates

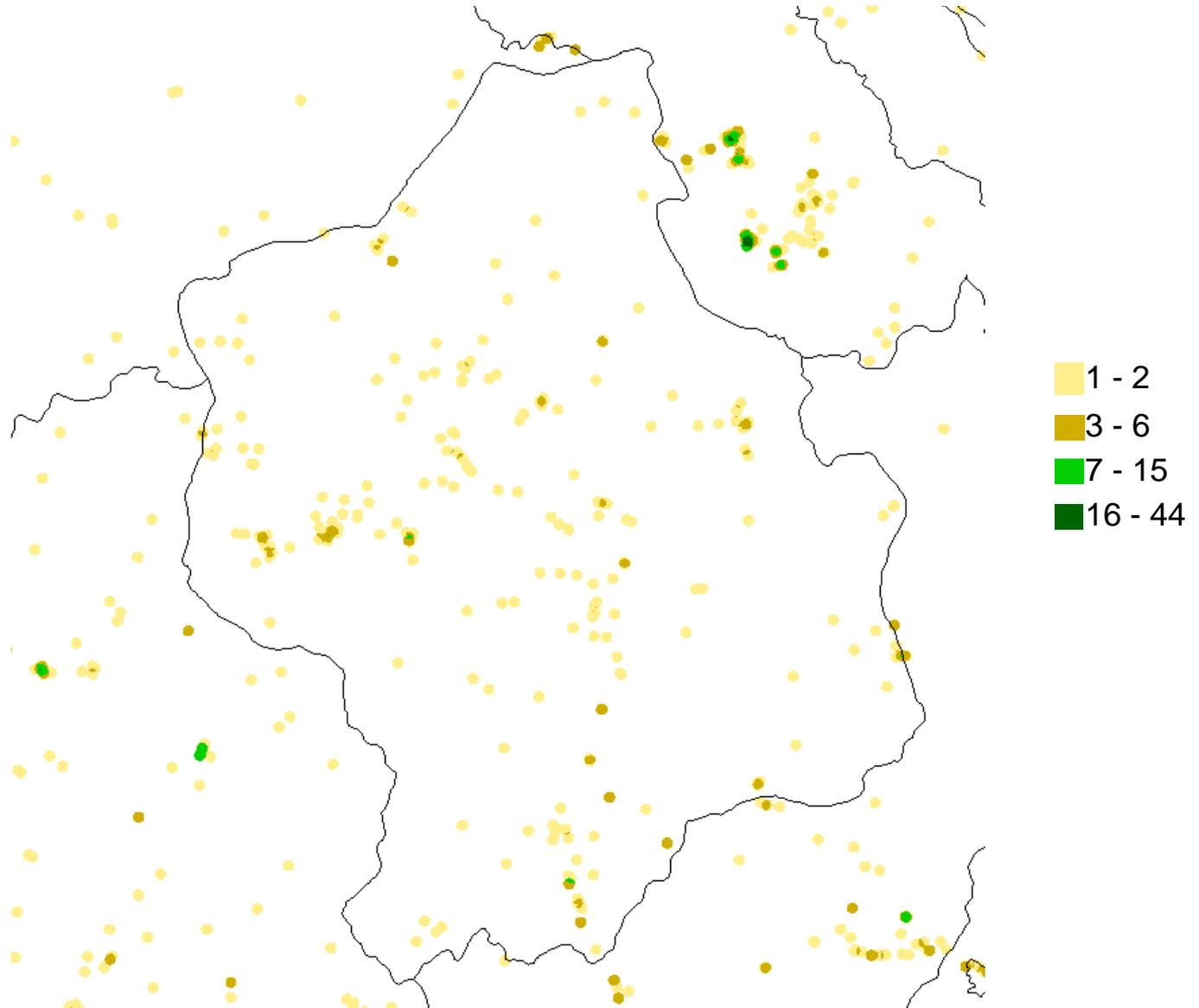


Element Occurrence Record density



Element Occurrence Record density

St. Francois Knobs and Basins



EOR Density Grid

Density with original
EOR point distribution

