Targeting productive lands enrolled in Forest Stewardship Programs

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Private landowners

- Biomass production critical on private lands
- Current market for woody biomass is limited – while prices for traditional crops is high
- Landowners often rely on Government assistance
  - What areas should be targeted?

Forest Stewardship Program (FSP)

- Provide non-industrial private landowners with long term management strategy

- Goal: Enhance productivity and health of America's forests at local level

Illinois Forestry Development Act of 1983

Act comprised of 4 parts:

- Forestry Development Council
- Forestry Development Cost Share Program
- Forestry Development Fund
- Tax Incentives

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Spatial Analysis Project

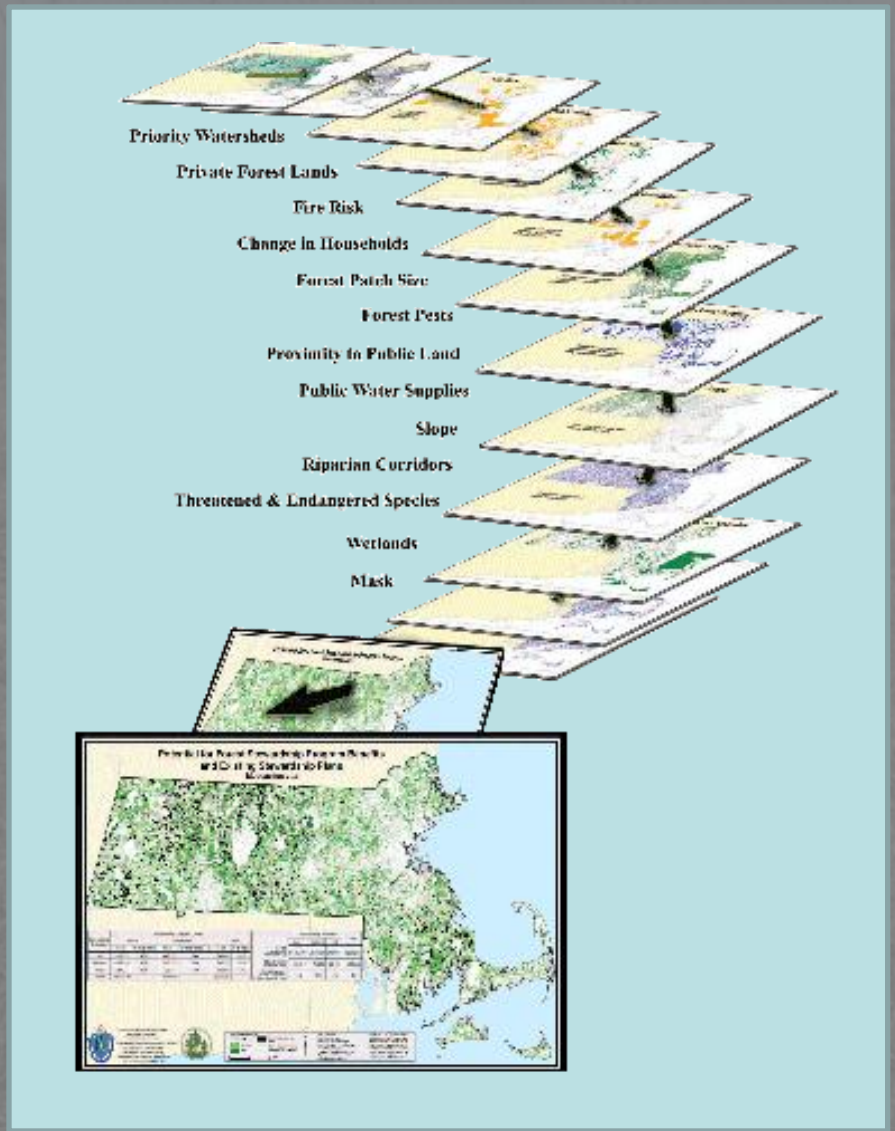
- Purpose: provide a strategic method of enrolling lands with highest ‘stewardship potential’
- ‘Stewardship potential’ – areas rich in natural resources, vulnerable to threat

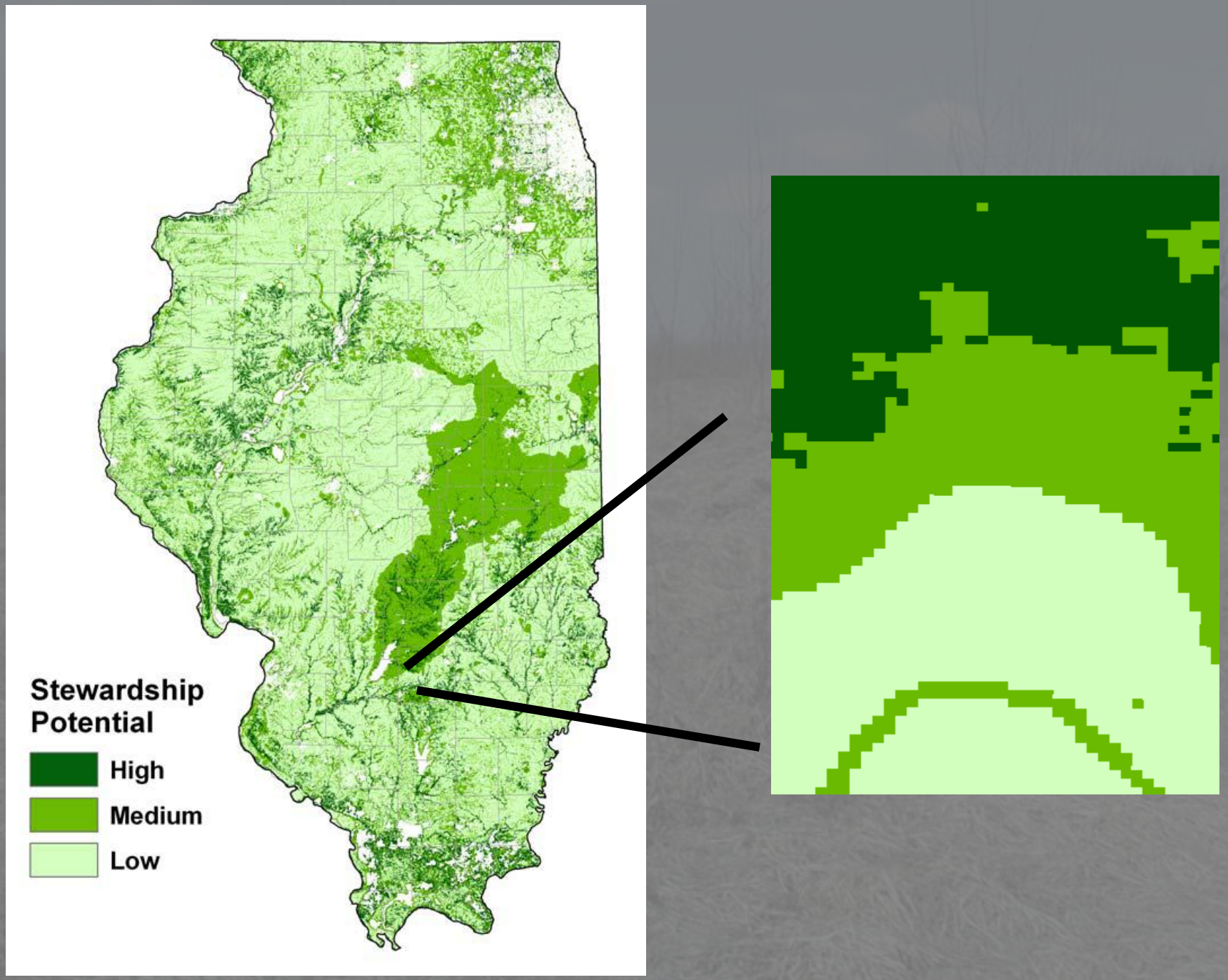
Spatial Analysis Project

- Stewardship potential - comprised of 12 data layers
- Each State addressed specific conditions

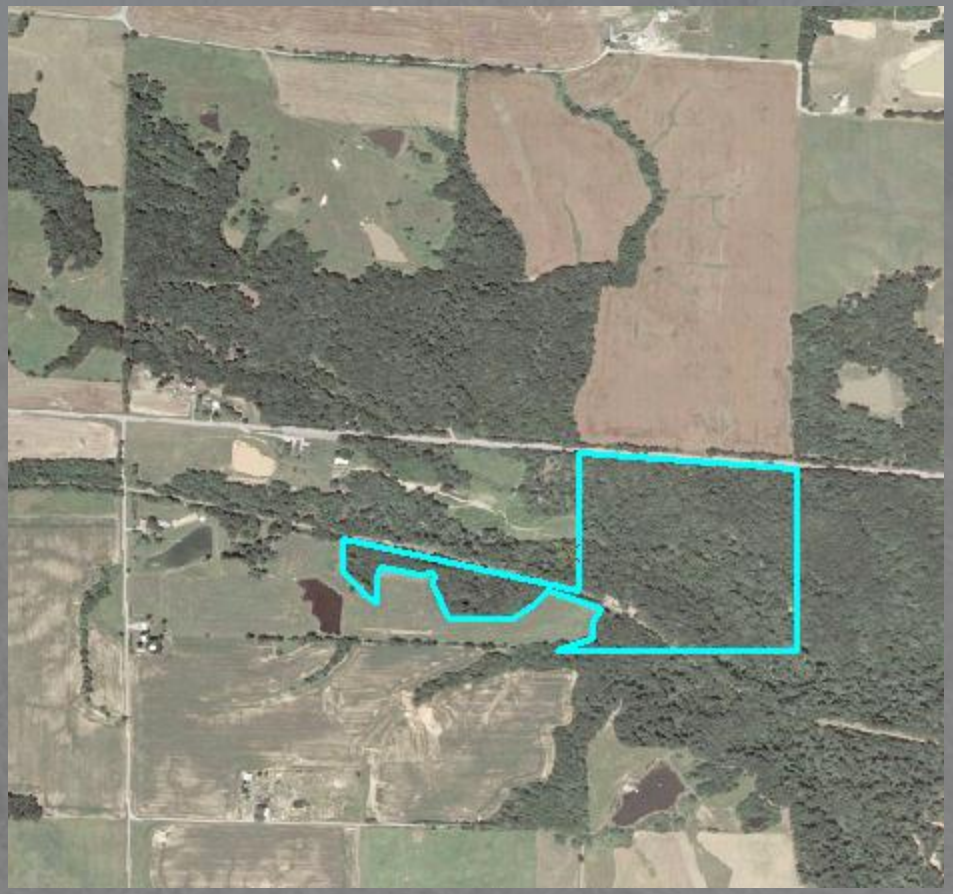
12 Layers
Private Forest
Forest Patches
Riparian Corridors
Priority Watersheds
Proximity to Public Land
Forest Health
Developmental Pressure
Wetlands
Drinking Water Supply
T & E Species
Topographic Slope
Fire Risk

Spatial Analysis Project

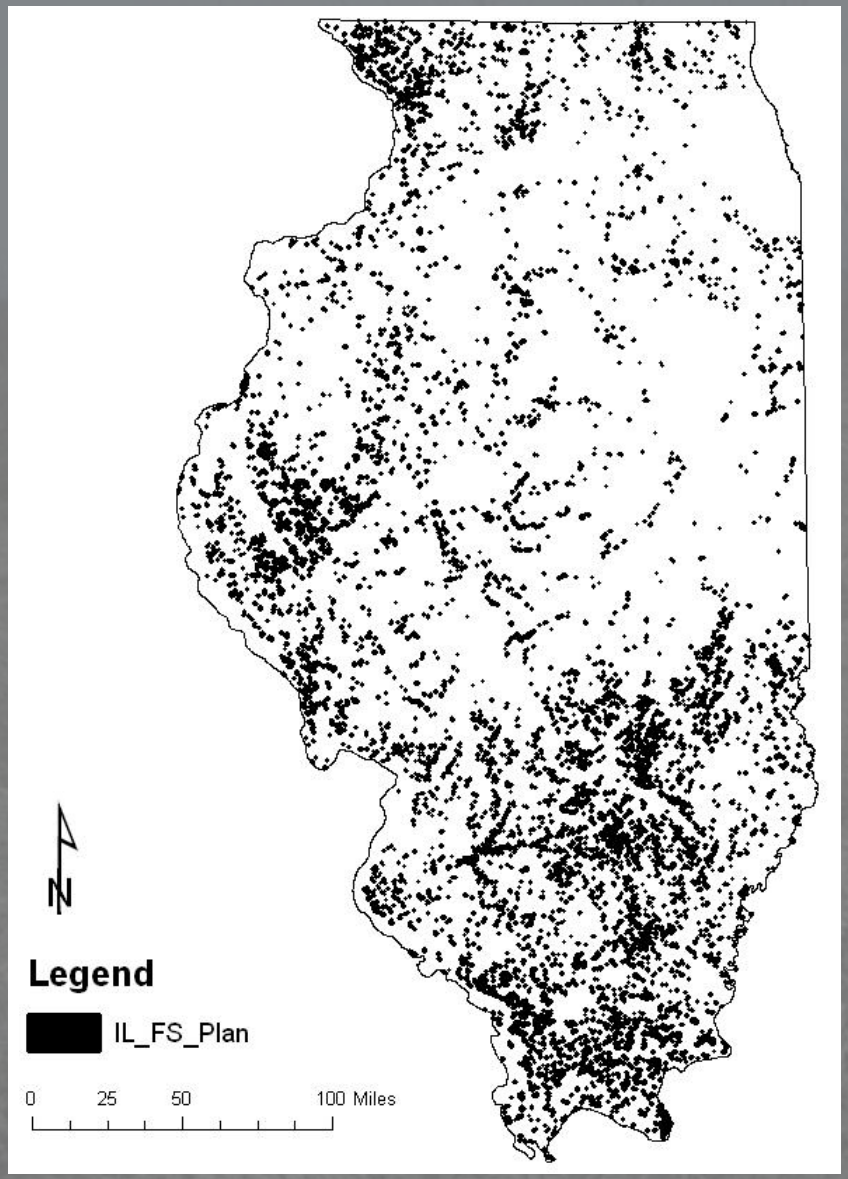


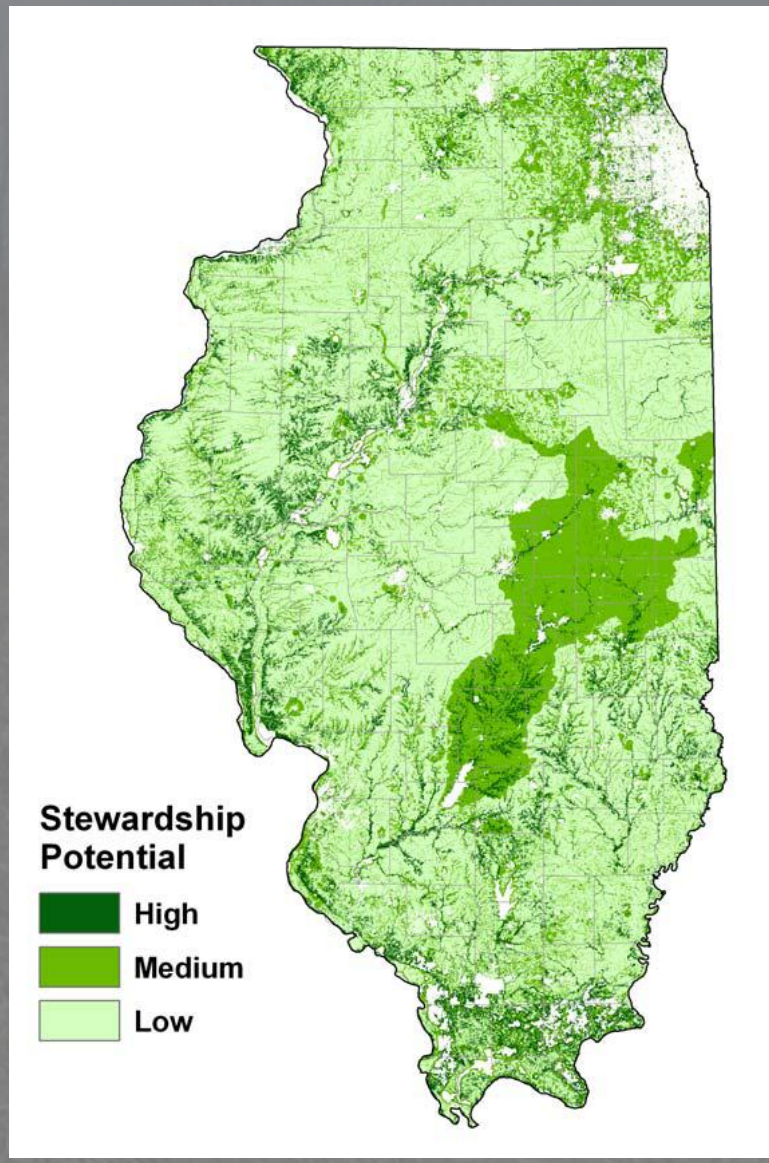

Stewardship Potential
High
Medium
Low


Rt. 4
Stand 1
48.5 ac.
Inman Rd.
400 0 400 800 Feet
NE1/4, Sec. 29, and
NW1/4, NW1/4, Sec. 28,
T. 7 S. - R. 3 W., Jackson County
48.5 acres woodland mgt.

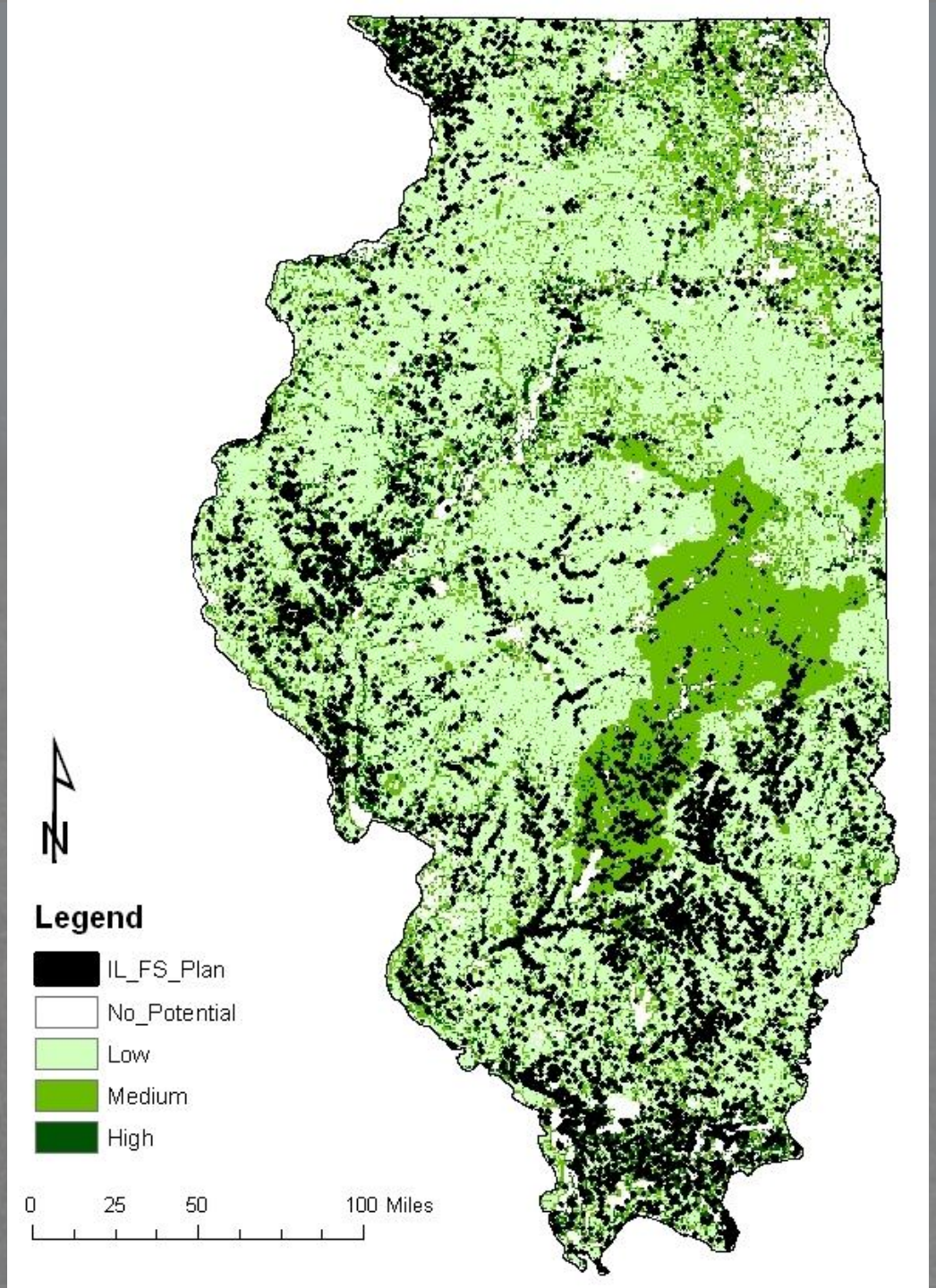


Current FSP plans and FSP data layer





Current Illinois FSP plans overlaid on FSP data layer



FSP enrollment in Illinois

	Low	Medium	High	Total
Potential stewardship area (ha)	8,379,180	3,439,391	1,377,059	13,195,658
Enrolled stewardship area (ha)	25,413	33,536	76,353	135,302
Stewardship area vs. Enrolled area	0.2%	0.8%	5%	0.9%

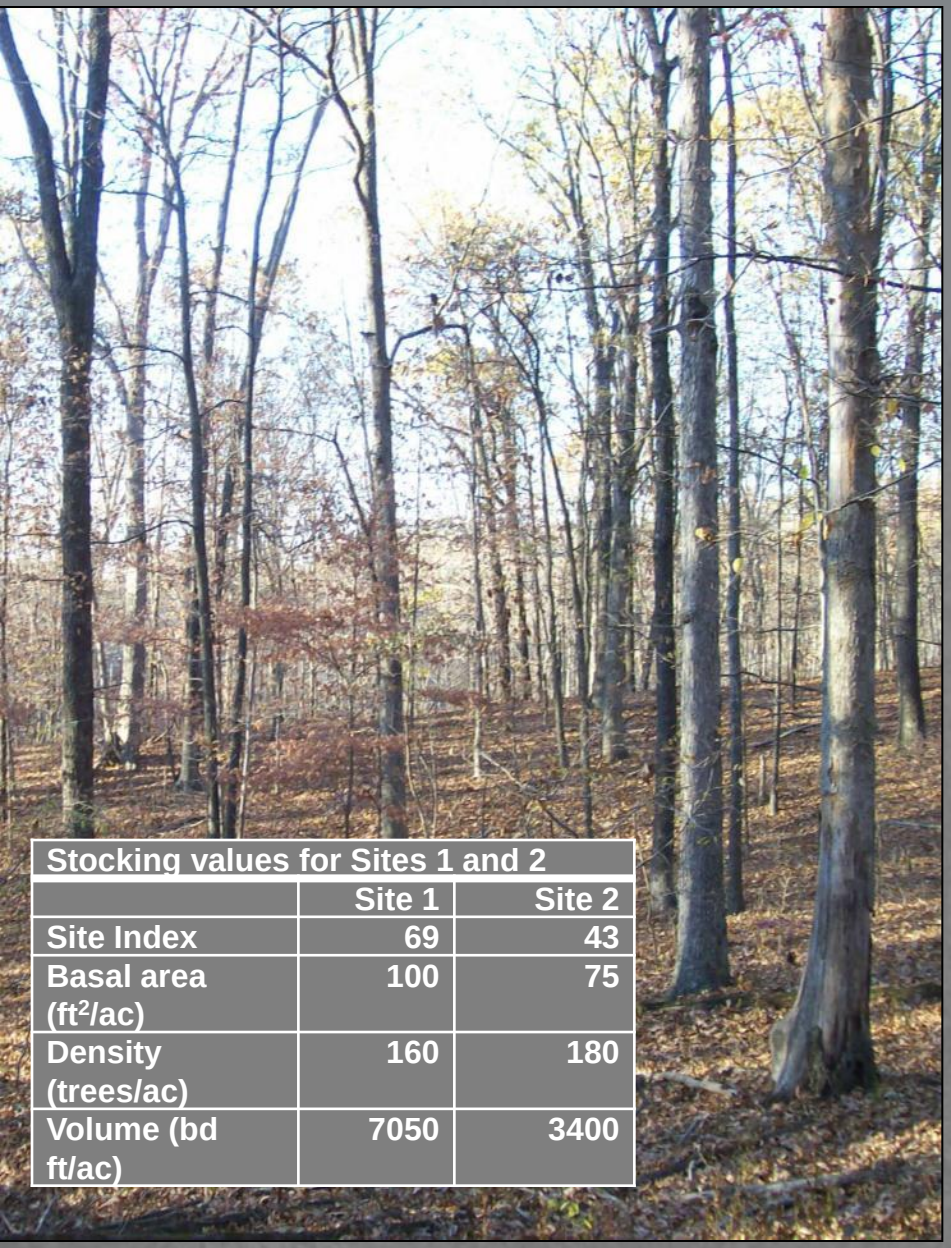
Chi square statistic: $\chi^2 = 234$, df =2, p value < 0.0001

Stewardship Potential in Illinois

Steward Potential	Forest		Non-forest		Total	
	Hectares	%	Hectares	%	Hectares	%
Low	0	0	8,379,204	74	8,379,204	64
Medium	663,056	34	2,778,358	25	3,439,391	26
High	1,295,069	66	81,994	1	1,377,063	10
Total	1,956,101	100	11,239,557	100	13,195,658	100

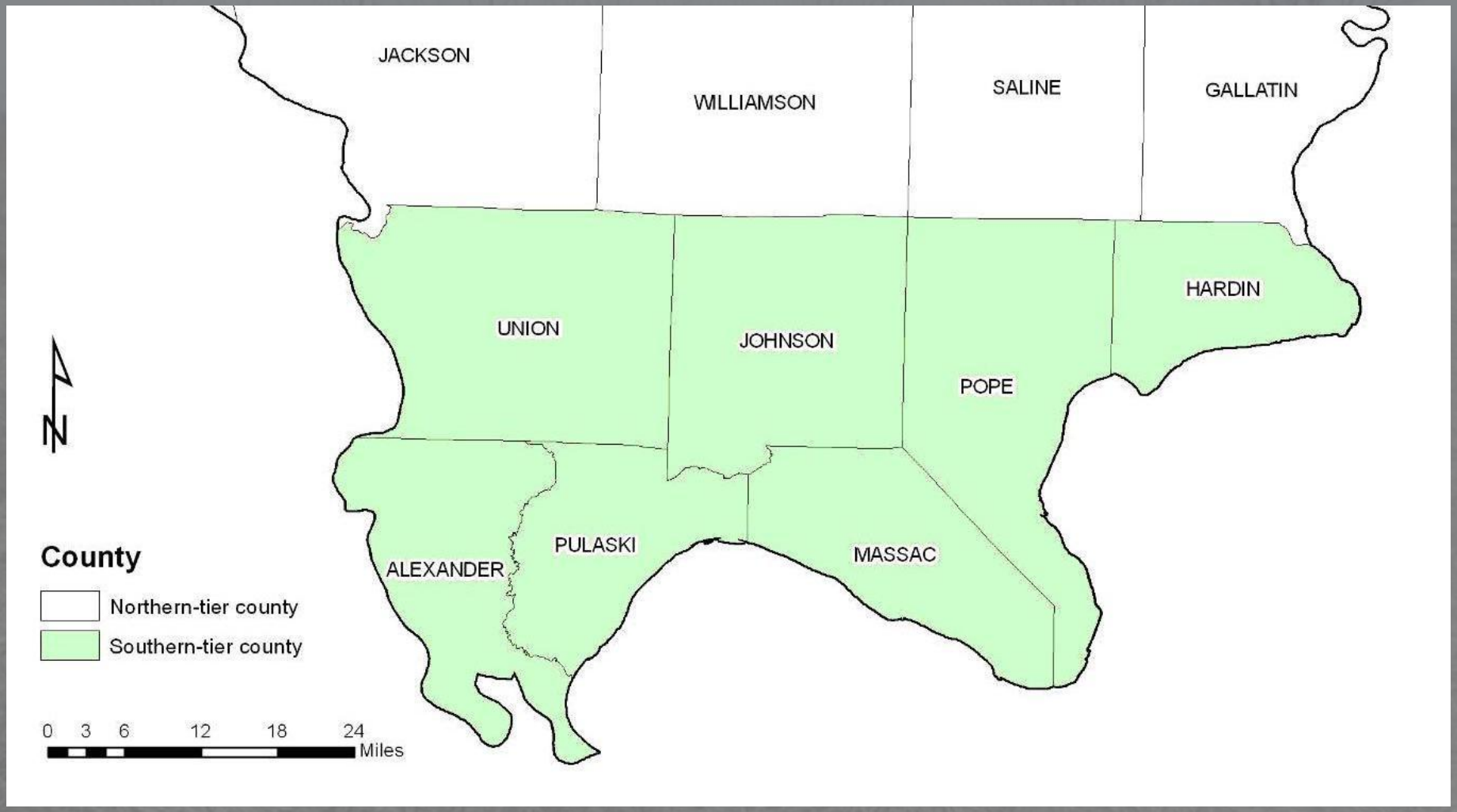
- Results don't reflect State Forest Resource Assessment priorities
- Don't allow for prioritized funding

Can the priority process be improved?

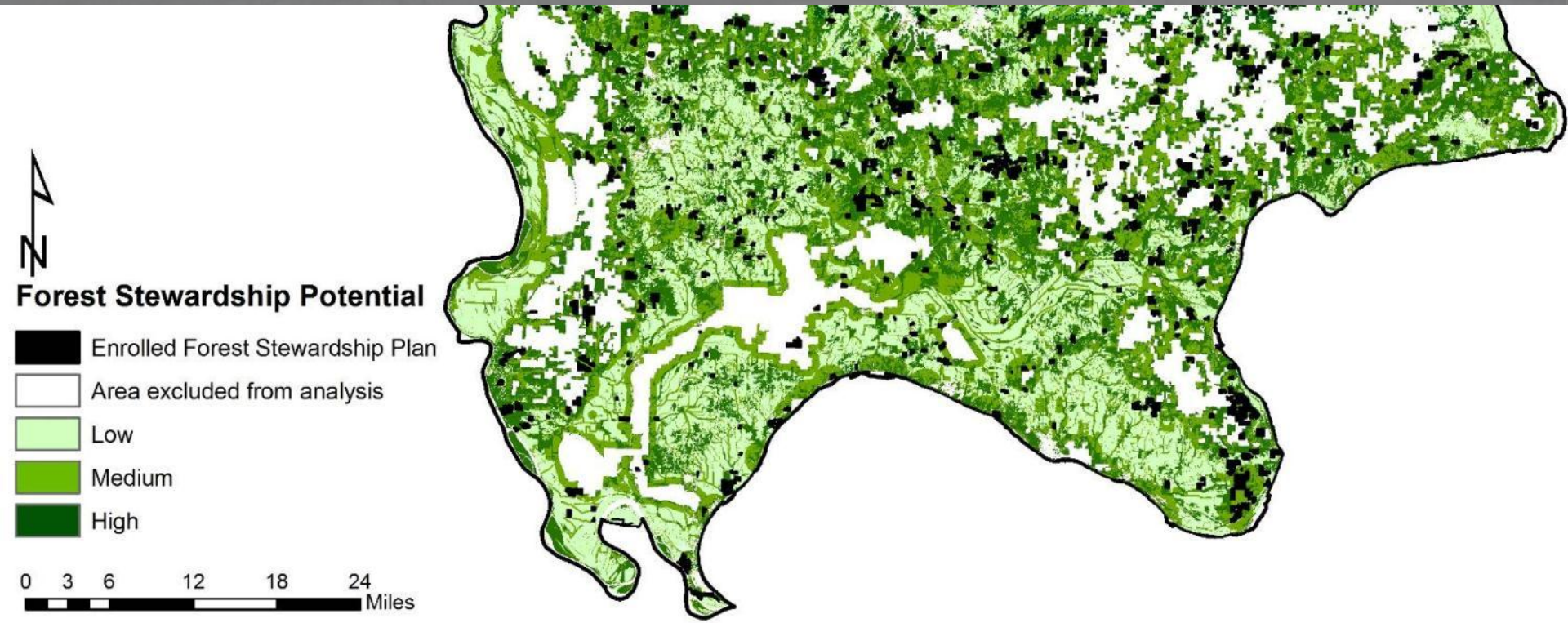


Stocking values for Sites 1 and 2		
	Site 1	Site 2
Site Index	69	43
Basal area (ft^2/ac)	100	75
Density (trees/ac)	160	180
Volume (bd ft/ac)	7050	3400

Southern 7 counties



Map of forest stewardship potential



FSP enrollment in southern Illinois

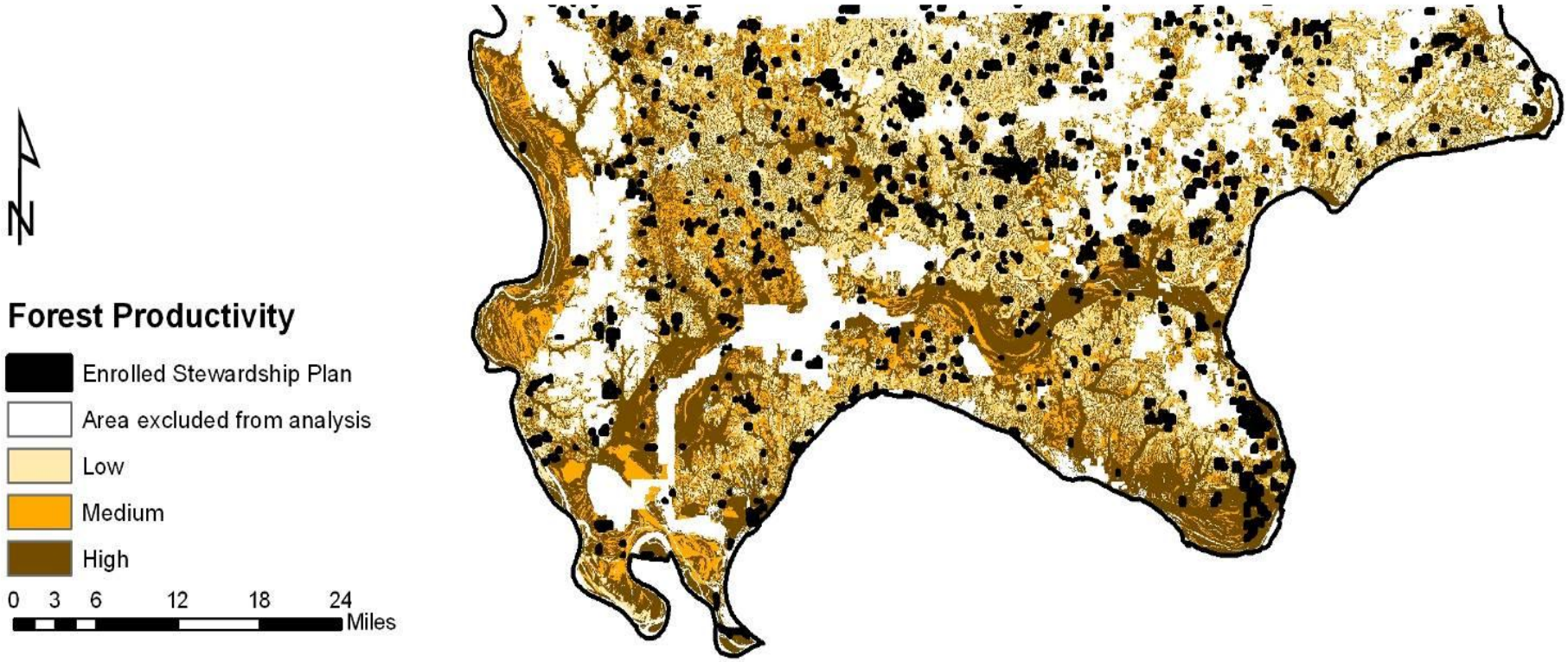
	Low	Medium	High	Total
Stewardship Potential (ha)	117,023	121,175	148,111	386,308
Enrolled areas (ha)	1,142	2,235	11,535	14,803
Stewardship area vs. Enrolled area	<1%	2%	8%	4%

Chi square statistic: $\chi^2 = 66.6$ df = 2 $p < 0.0001$

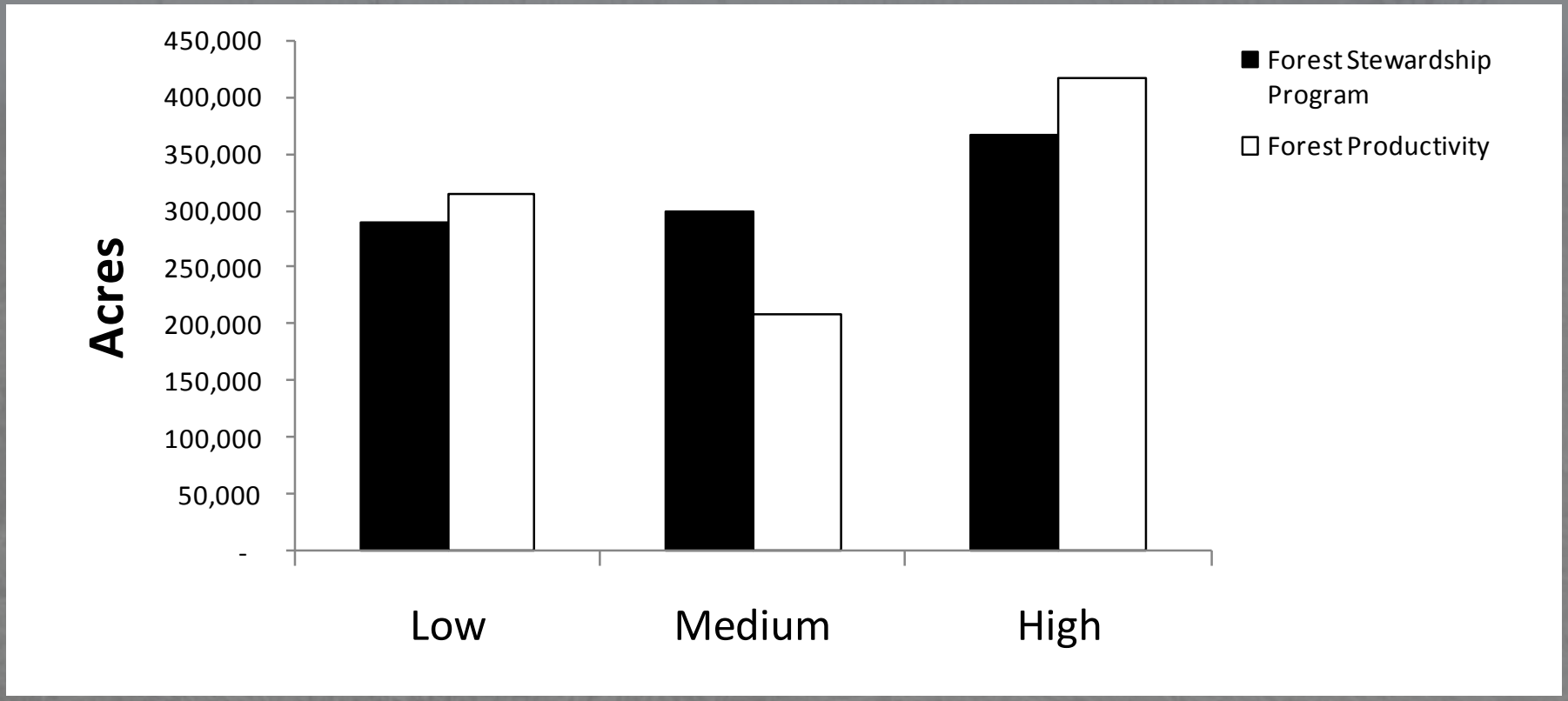
Forest Productivity Classification

Site type	Site index	Site type	Site index	Productivity
Bottomland	>105	Upland	>65	High
	96-105		51-65	Medium
	<96		<51	Low

Map of forest productivity with enrolled FS plans

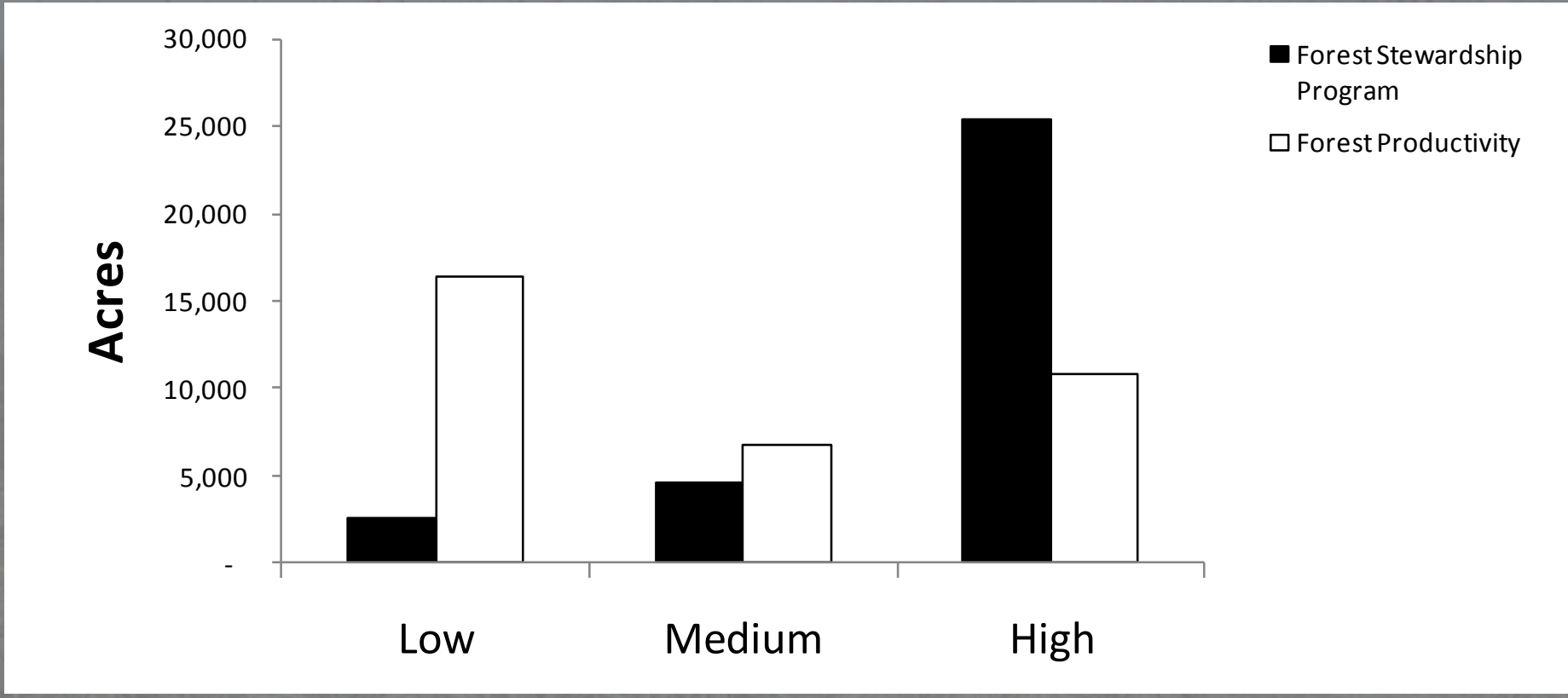


Comparison of available areas for forest stewardship



Chi square statistic: $\chi^2 = 3.99$ df = 2 $p > 0.05$

Comparison of enrolled properties for forest stewardship



Chi square statistic: $\chi^2 = 246.1$ df = 2 $p < 0.0001$

Spatial comparison of FP vs. FSP

Forest Productivity

Low	Medium
High	Medium

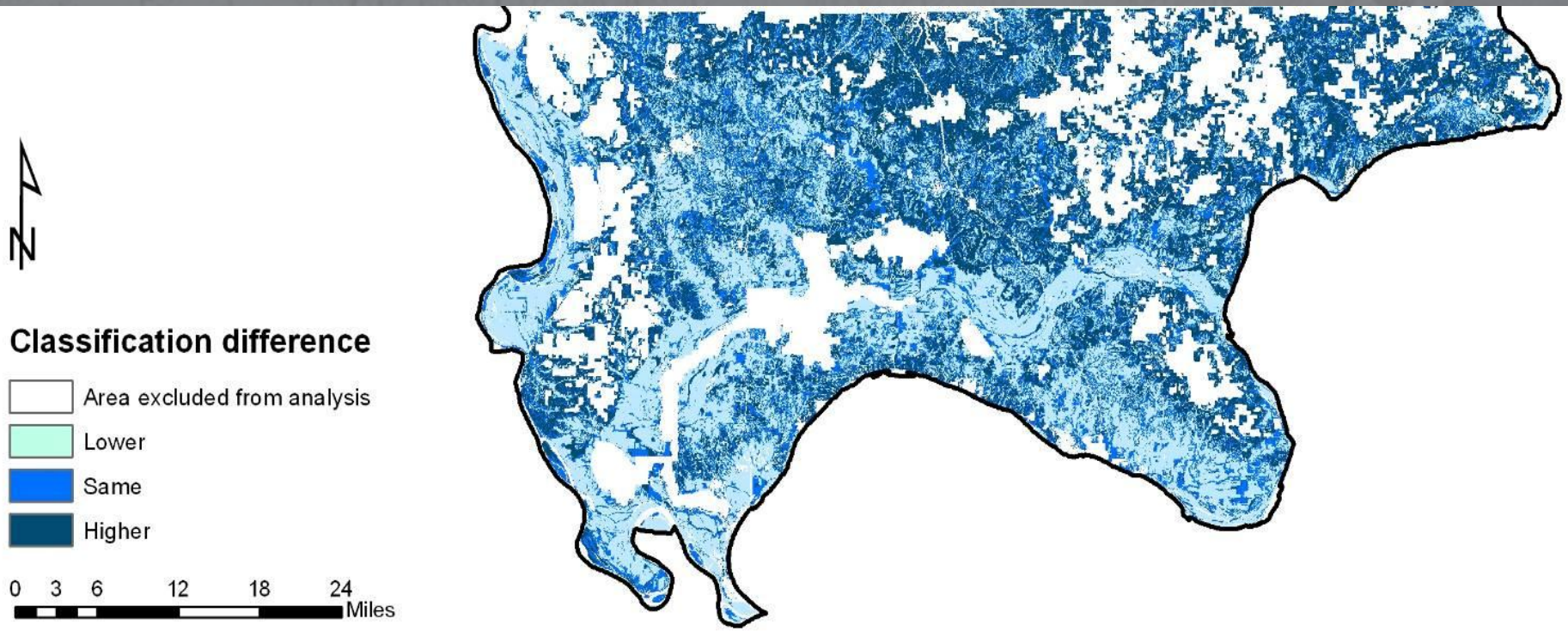
Stewardship Potential

High	Medium
Low	High

Result of Comparison

High	Same
Low	High

Map FSP vs. FP


N
Classification difference
Area excluded from analysis
Lower
Same
Higher
0 3 6 12 18 24
Miles

Stewardship Potential vs Forest Productivity

		Stewardship Potential					
		Low (%)		Medium (%)		High (%)	
		Available	Enrolled	Available	Enrolled	Available	Enrolled
Forest Productivity	Low	18	11	19	23	28	30
	Medium	50	61	51	53	52	50
	High	32	28	30	24	20	20

Holzmueller, E.J., M.A. Martinek, and J.W. Groninger. In press. Do Forest Stewardship Programs target productive lands? A southern Illinois case study. Journal of Forestry.

Conclusion

- GIS can be powerful tool in planning for biomass production
  - Identify ‘high’ priority areas
    - Forested areas
    - Non-forested areas
  - Prioritize area across landscape

- GIS models need careful consideration in order to produce meaningful results

Acknowledgements

- Individuals: Michael Martinek, Chelsea Schroeder, Kent Delai, Kurt Krapfl, Kevin Davie, Wade Conn, Dr. John Groninger, Dr. Charles Ruffner, & Dr. Andrew Carver

- Funding: US Forest Service, Southwestern IL RC&D, IDNR-Division of Forestry, SIU Department of Forestry

Questions?