GAP

presented by:

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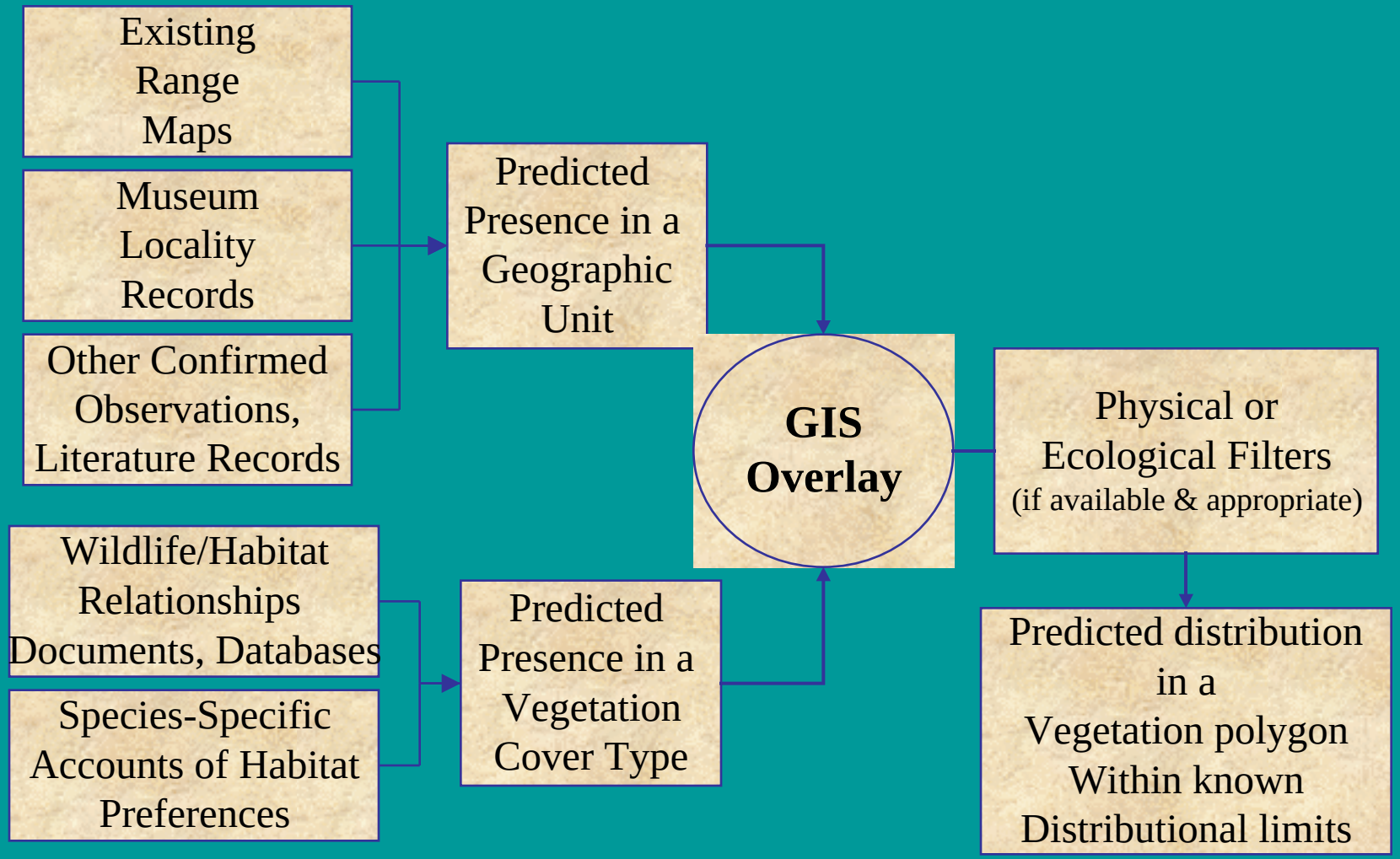
Schematic diagram showing steps in the development of a generalized predicted vertebrate, amphibian, reptile, bird, or mammal distribution map for Gap Analysis.



Wildlife Distribution Data Bases

- Heritage database
- Breeding bird surveys
- Winter bird counts
- Furbearers survey
- Herp collection
- Insect collection
- Mammal collection
- Bird collection
- MOFWIS
- Rare, Threatened, and Endangered

Wildlife/Habitat Models

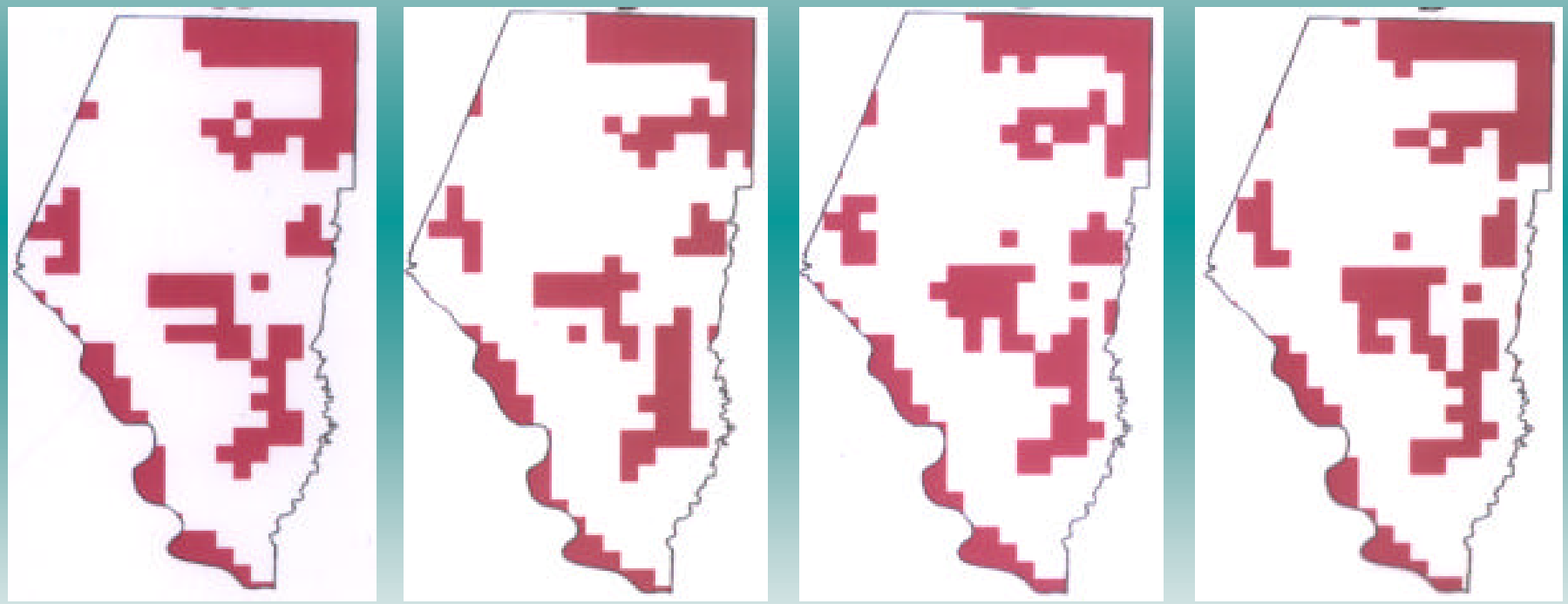
- MoFWIS
- WHAG
- HEP
- PATREC
  - Biologist review and evaluation
  - “Indicator species”
  - “Guild representatives”

Wildlife Verification

- Sampling scheme
- Sampling effort
- Sampling methodologies - herps / birds / mammals
- Testing and model evaluation
- Presence / absence

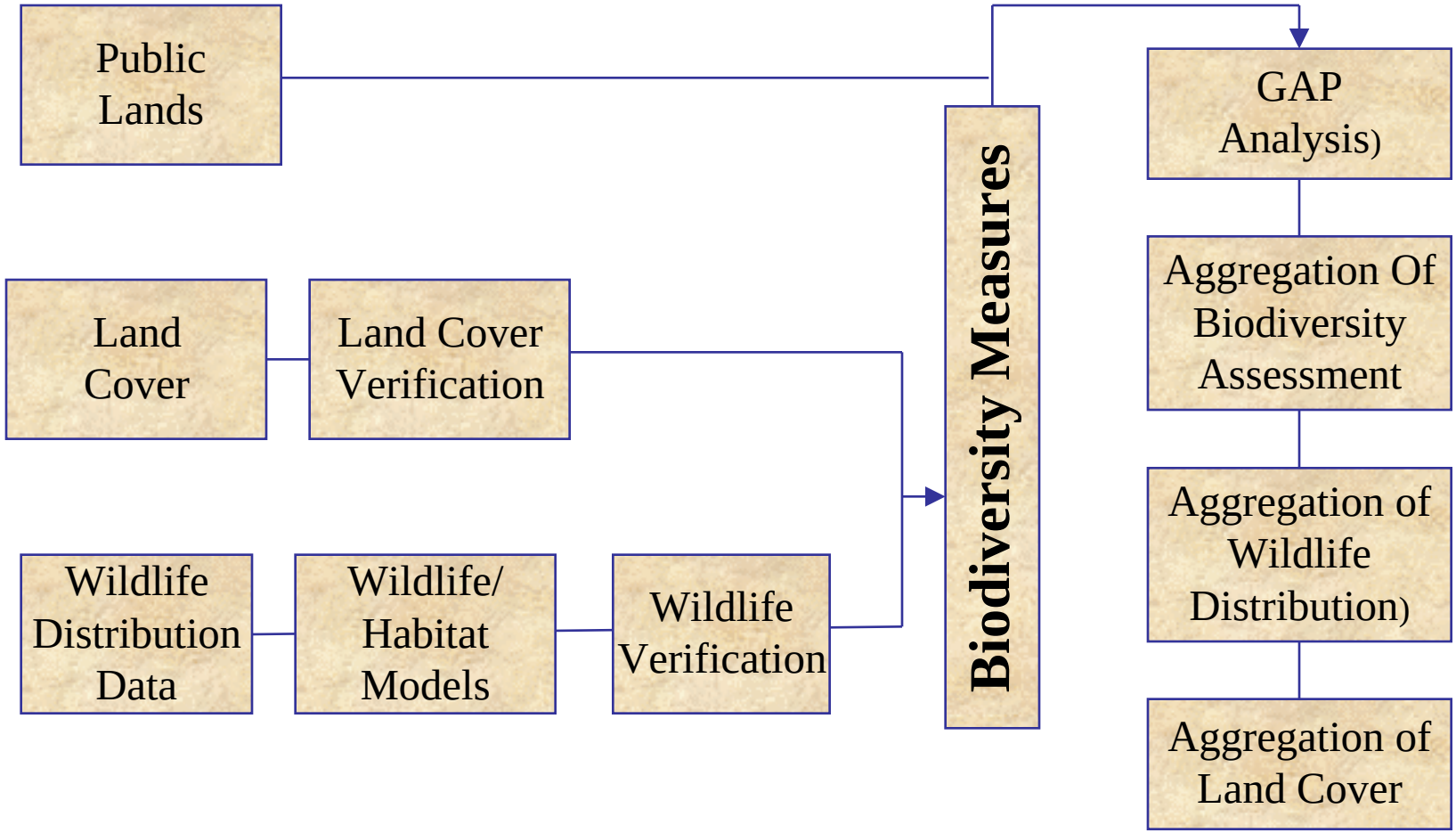
Cooper's Hawk Model

Zonalmean Process



A **B** **C** **D**

Data Resources

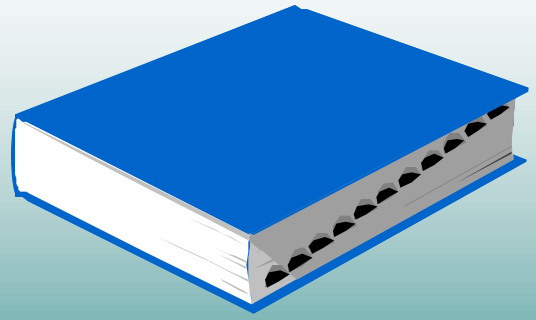


Determine Database Contents

Identify Database Issues

- Standardization
- Redundancy
- Security Needs
- Organizational Responsibilities
- Format (Manual / Automated)
- Keys and Geocodes
- Systems Integration
- Data Integration & Layer Rectification
- Data Maintenance and Management
- Resources

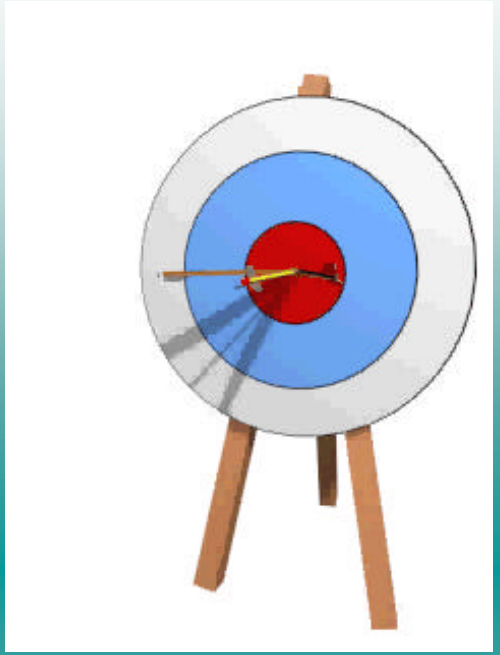
Data Dictionary



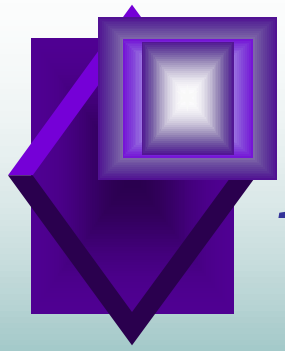
- Definition
  - Detailed description of data within a database
  - “Users Guide” to the database
- Functions
  - Focal point for data standardization
  - Facilities development of application programs
  - Assists with database design process
  - Improves understanding of the data
  - Reduces data redundancy
  - Improves data integrity

Normalization

A process within database design that specifies what values a column may contain and how columns in the table are to be dependent of the primary key.



The aim is to eliminate all unnecessary data duplication.

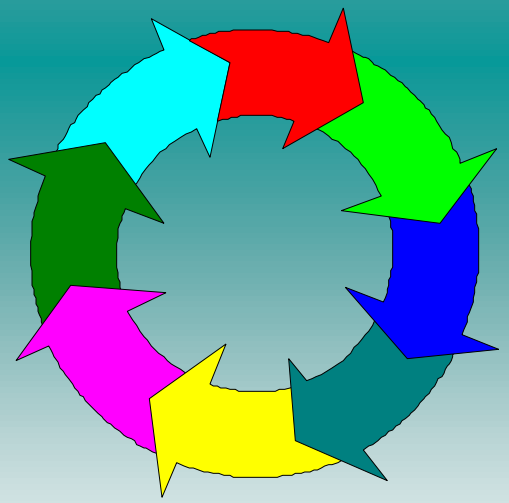


Database Design

- Determine the purpose of your database (analysis)
- Determine the tables you need
- Determine the fields you need
- Determine the relationships
- Refine your design

Desirable database characteristics should be:

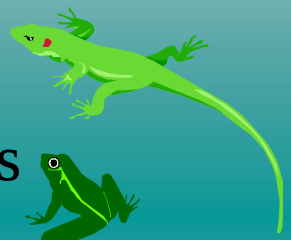
- Same vintage
- A detailed as necessary
- Positionally accurate
- Exactly compatible
- Internally accurate
- Readily updated
- Accessible



GAP Analysis
Data Layer Tracking

Vertebrate Distributions

- Reptiles
  - Ranges



- Amphibians
  - Ranges

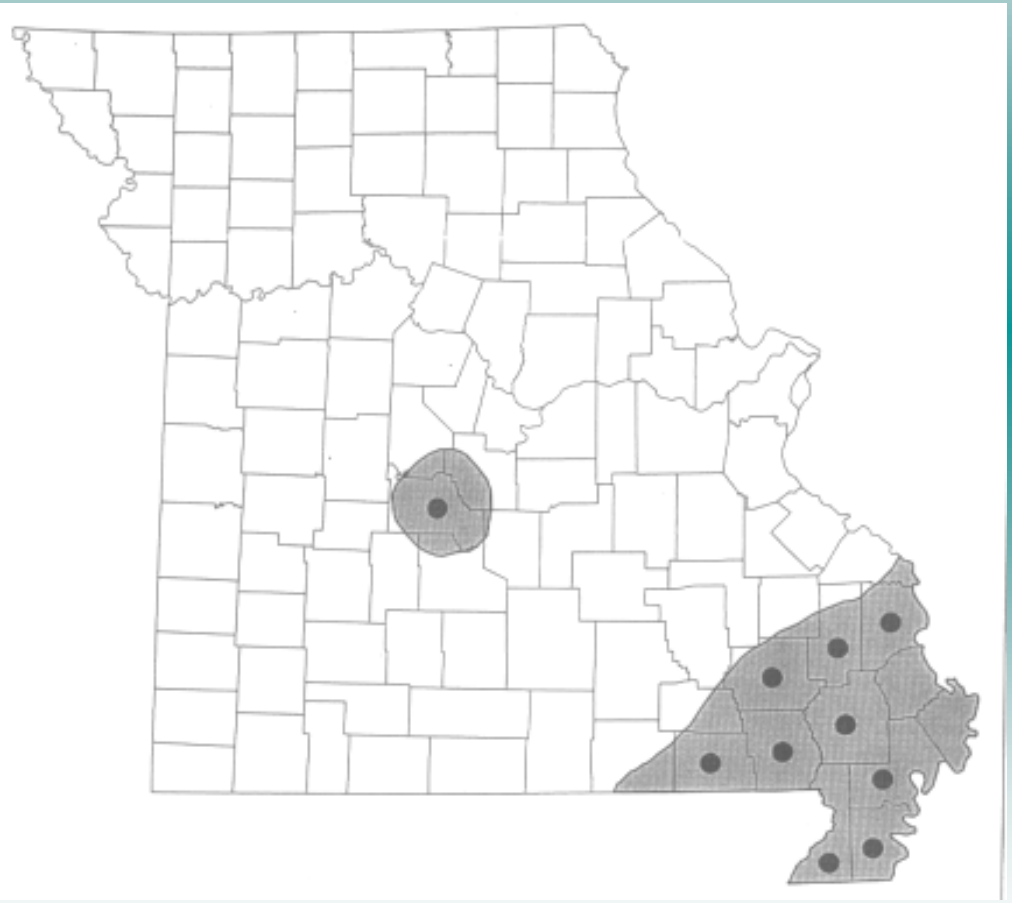
- Birds
  - Breeding Bird Atlas
  - Museum Records - MU
  - Museum Records - KU

- Mammals
  - Arches Index - sign station
  - Museum records - MU
  - Deer Management Units

- Species Lists for Areas

Distribution of Green Tree Frog

Hyla cinerea *in Missouri*



Each dot represents a known country record.

The shaded area is presumed range.

Source: *The Amphibians and Reptiles of Missouri* by Tom R. Johnson
Maps digitized at the GRC in the Spring of 1996.

Pileated Woodpecker

http://www.mbr-pwrc.usgs.gov/bbs/bbs.html

General Information
- Introduction
- About the BBS
- Help Index
- A Note on Taxonomy

Survey Results
- Summary information on population change by region and time period
- This program allows you to display trends for 3 time intervals, by either species or region.
- This program allows you to display annual indices of abundance for any species in any region.
- These are relative abundance maps, estimated over the interval 1982-1996.
- These are maps of population change, based on the 1966-1996 interval.
- These maps, based on BBS data in Alaska, are very rough. We will update them occasionally.
- These lists provide mean abundances for all species encountered on the BBS in a state/province, summarized by physiographic region.

Interactive Mapping Information
- This program allows you to estimate mean abundance from BBS data for any species, at any location in the survey area. (This now includes Alaska!)

Analytical Tools
- This program allows you to estimate (and plot) population change for any species, on any BBS route.
- This program allows you to estimate population change for any species and time interval, in any region covered by the BBS

Learning Tools
- This link transfers you to the species identification section, in which is contained pictures, songs, and identification tips of most North American Bird Species.
- This link transfers you to the species information section, that contains links to species-specific information such as life history, identification, distribution maps, pictures, and songs.
- Test your skills of identifying North American bird songs, pictures, and breeding and wintering distributions.
- Check out some of our ongoing research projects on migratory birds.

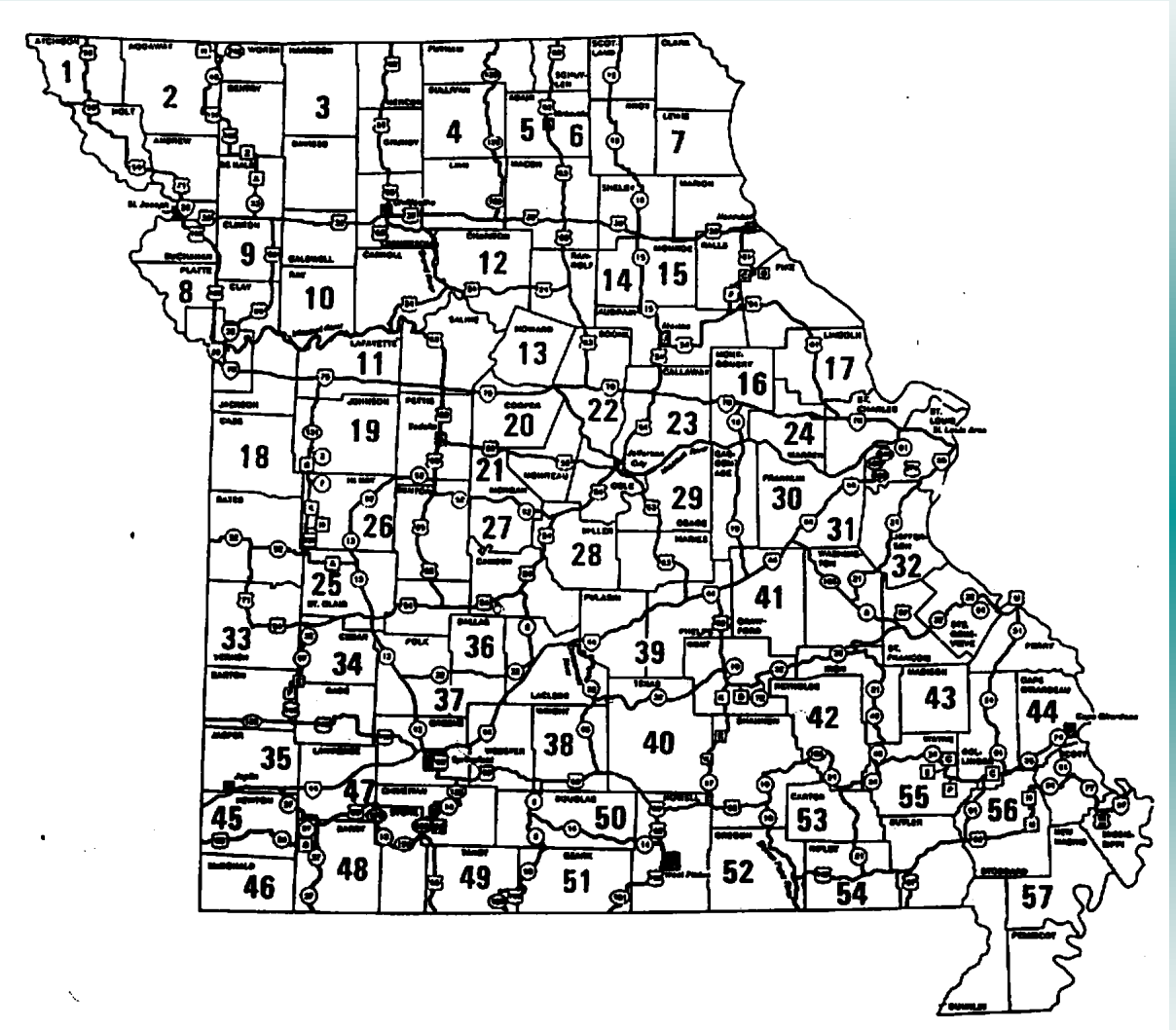
Viewer Response Line: Tell us What you Think!

Links to Additional Information Sources
Monitoring Programs at Patuxent
Patuxent Wildlife Research Center

Regional Visitation Summary 1994

SPECIES		ZOOGEOGRAPHIC REGIONS							
		NWP	NR	NER	WP	WOB	OP	NEOB	ML
Number Station Nights		99	95	190	97	96	288	86	48
Coyote	Index	40.4	115.8	73.7	144.3	145.8	65.0	46.5	62.5
	s.d. (Index)	19.8	32.8	19.0	35.7	36.0	14.6	22.7	34.9
Dog	Index	111.1	31.6	100.0	123.7	187.5	93.8	69.8	145.8
	s.d. (Index)	31.6	17.9	21.8	33.4	39.8	17.2	27.5	50.9
Red Fox	Index	10.1	42.1	36.8	20.6	20.8	17.4	23.3	20.8
	s.d. (Index)	10.1	20.6	13.7	14.4	14.6	7.7	16.3	20.6
Gray Fox	Index	0.0	10.5	21.1	10.3	20.8	38.2	162.8	62.5
	s.d. (Index)	0.0	10.5	10.4	10.3	14.6	11.3	39.8	34.9
Bobcat	Index	0.0	0.0	0.0	10.3	10.4	6.9	0.0	20.8
	s.d. (Index)	0.0	0.0	0.0	10.3	10.4	4.9	0.0	20.6
House Cat	Index	70.7	94.7	31.6	113.4	125.0	38.2	81.4	20.8
	s.d. (Index)	25.8	30.1	12.7	32.2	33.8	11.3	29.5	20.6
Striped Skunk	Index	60.6	31.6	21.1	10.3	0.0	27.8	0.0	20.8
	s.d. (Index)	24.0	17.9	10.4	10.3	0.0	9.7	0.0	20.6
Mink	Index	0.0	0.0	0.0	0.0	10.4	0.0	0.0	104.2
	s.d. (Index)	0.0	0.0	0.0	0.0	10.4	0.0	0.0	44.1
Weasel	Index	0.0	0.0	0.0	0.0	0.0	3.5	0.0	41.7
	s.d. (Index)	0.0	0.0	0.0	0.0	0.0	3.5	0.0	28.8
Raccoon	Index	90.9	115.8	136.8	134.0	93.8	31.3	81.4	62.5
	s.d. (Index)	28.9	32.8	24.9	34.6	29.8	10.3	29.5	34.9
Opossum	Index	80.8	94.7	94.7	51.5	83.3	20.8	46.5	125.0
	s.d. (Index)	27.4	30.1	21.3	22.5	28.2	8.4	22.7	47.7
Rabbit	Index	20.2	73.7	78.9	61.9	31.3	34.7	0.0	0.0
	s.d. (Index)	14.1	26.8	19.6	24.5	17.8	10.8	0.0	0.0
Squirrel	Index	10.1	52.6	78.9	51.5	10.4	93.8	93.0	0.0
	s.d. (Index)	10.1	22.9	19.6	22.5	10.4	17.2	31.3	0.0
Deer	Index	40.4	105.3	110.5	30.9	0.0	24.3	34.9	0.0
	s.d. (Index)	19.8	31.5	22.8	17.6	0.0	9.1	19.8	0.0
Black Bear	Index	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	s.d. (Index)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Missouri Deer Management Units



For detailed regulations on deer hunting, consult the special leaflets issued each year. These are available after August 1 from hunting permit vendors or Conservation Department offices.

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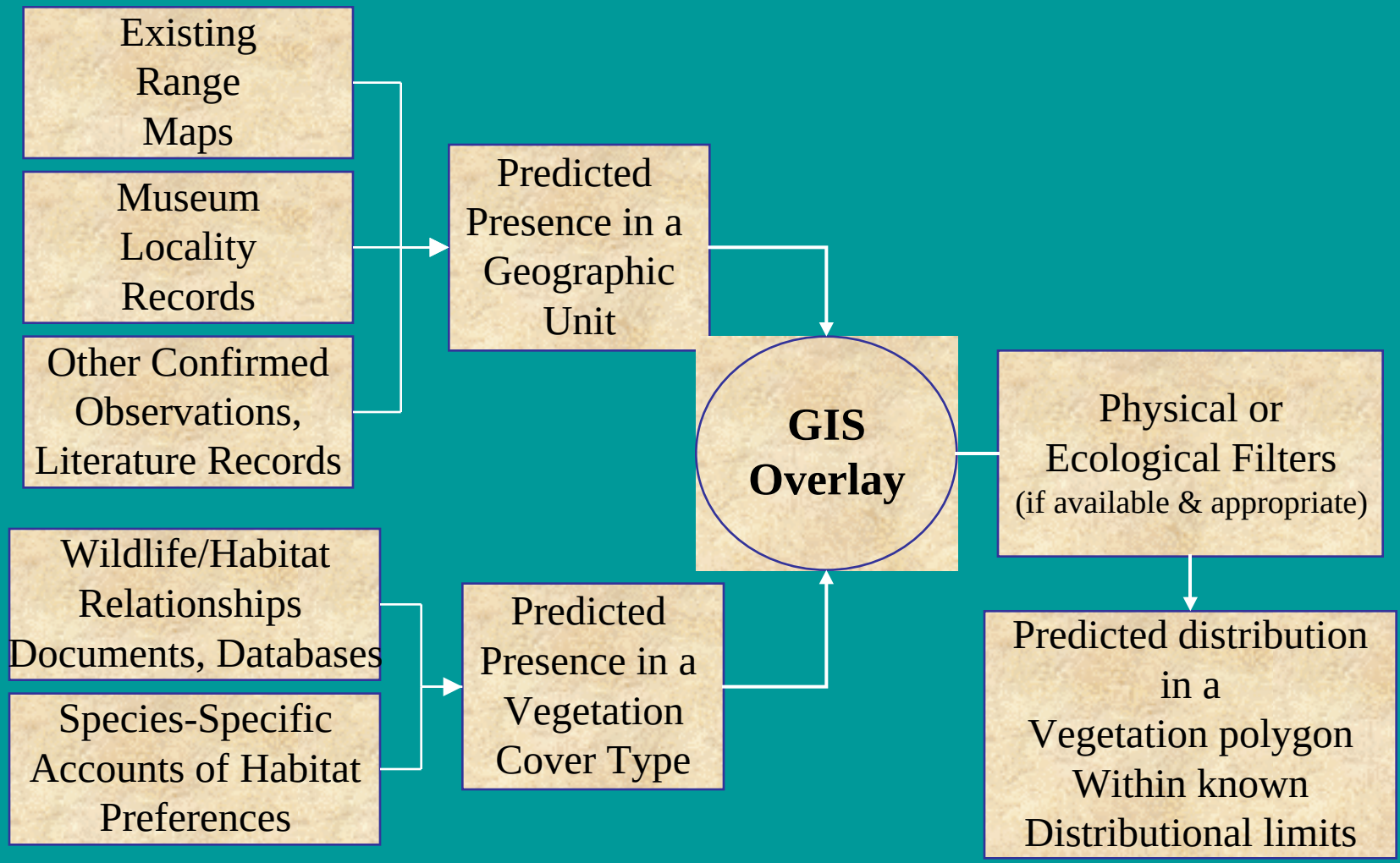
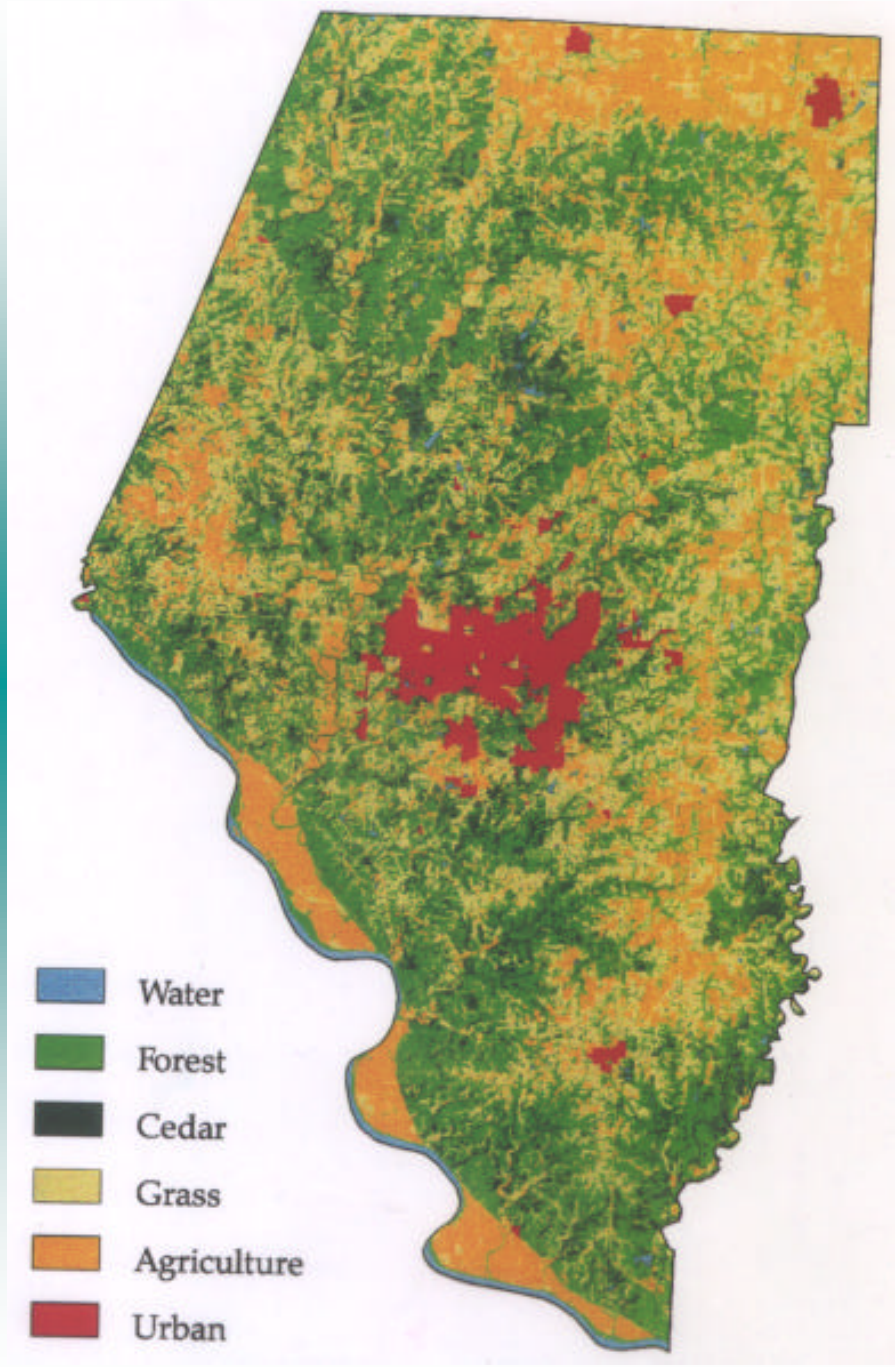


Habitat Classification & Comparison

(MoFWIS v. UNESCO)

MAMMALS	**MoFWIS**
Nine-banded Armadillo	Perennial Grass (Warm season) Perennial Grass (Cool season) Shrub Grass Fruiting Tree-Shrub Immature Hardwoods Mature Oak-Hickory (9” + dbh, open understory) Mature Oak-Hickory (9” + dbh, dense understory) Oak-Hickory Old Growth Mature Shortleaf Pine Shortleaf Pine Old Growth Marsh
Badger	Perennial Grass (Warm season) Perennial Grass (Cool season) Savannah (Grass-Shrub) Legumes (Tame)
Big Brown Bat	Perennial Grass (Cool season) Shrub-Grass Fruiting Tree-Shrub Eastern Red Cedar (70% + crown closure) Eastern Red Cedar (30% - 70% + crown closure) Oak-Hickory Old Growth Limestone Bluff and Cave

Land Cover

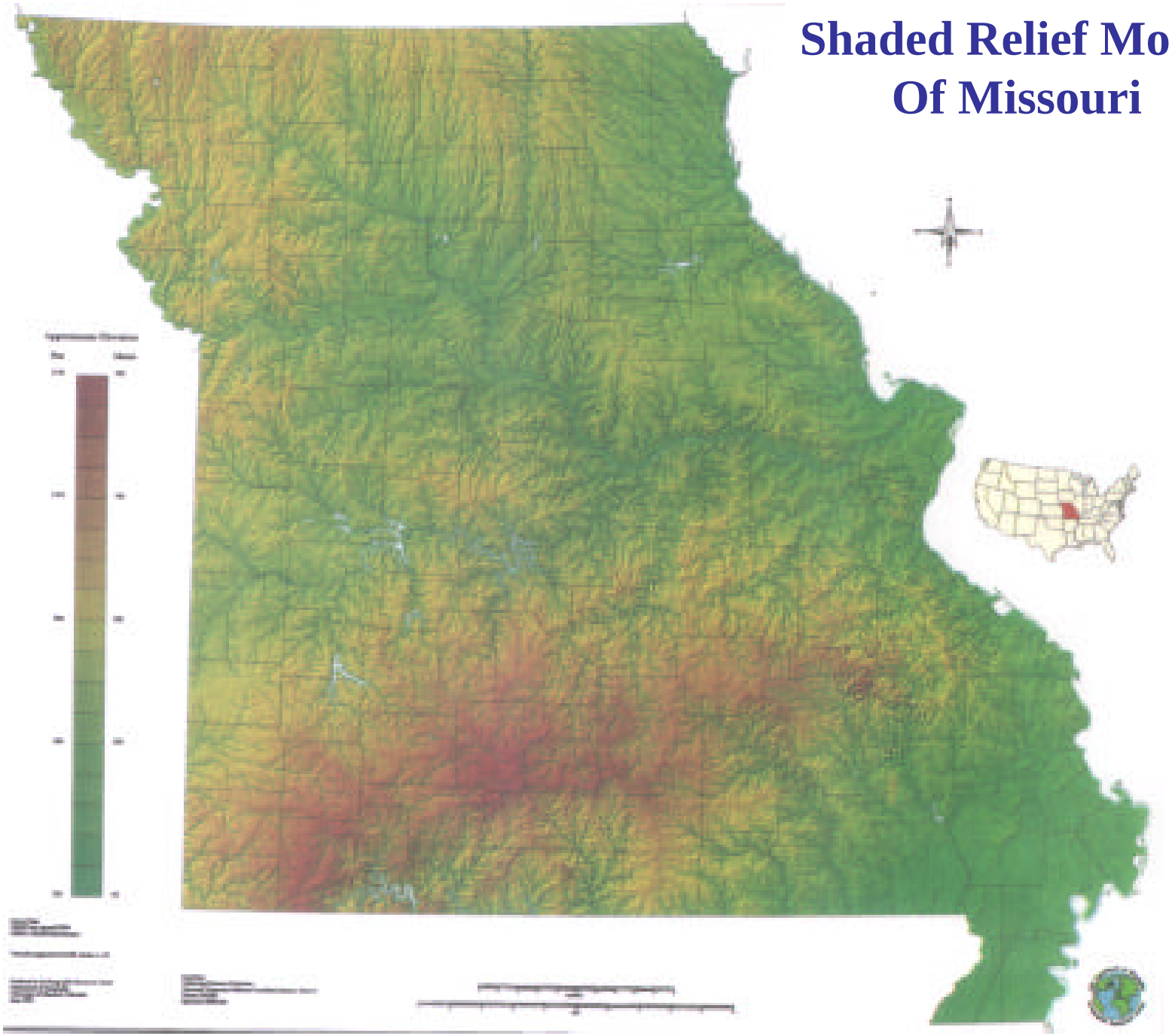


GAP Analysis
Data Layer Tracking

Vertebrate Modeling

- Preliminary / Background / Reference Information
  - MoFWIS
  - Breeding Bird List
  - Missouri Vertebrate List
  - Threatened & Endangered - Missouri
  - Threatened & Endangered - National
  - National Perspective by species - avian
- Landcover - Habitat Crosswalk Grids for Criteria
- Ancillary Information Data Sets for Modeling
  - General Soils
  - Geology
  - Streams - Perennial
  - Streams - Intermittent
  - Watersheds-Hydrologic Units
  - NWI -where available (75%)
  - Landform - Floodplain
  - Landform - Elevation
  - Landform - Complexity
  - Moisture Class Isoclines
  - Temperature Isoclines
  - Precipitation Isoclines
  - Solar Radiation - Landform Derived
  - Evapotranspiration Isoclines
  - Growing Days Isoclines
  - Phenology Index Isoclines
  - Caves - GNIS reselect
  - Springs - GNIS reselect

Shaded Relief Model Of Missouri



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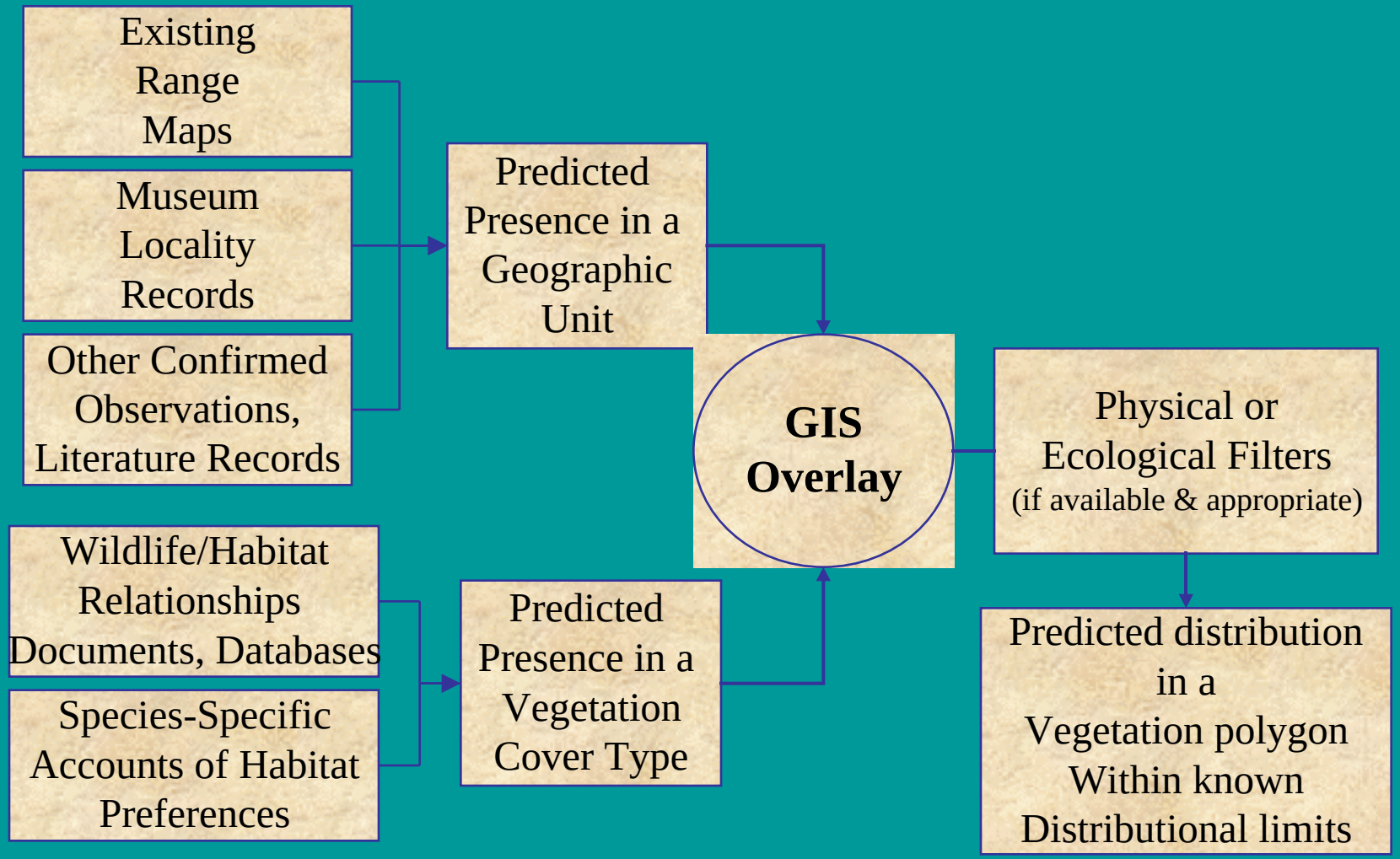
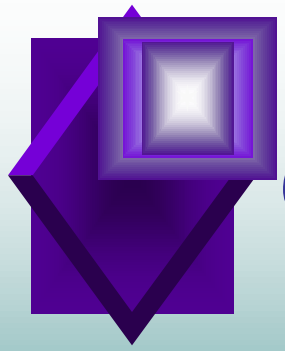
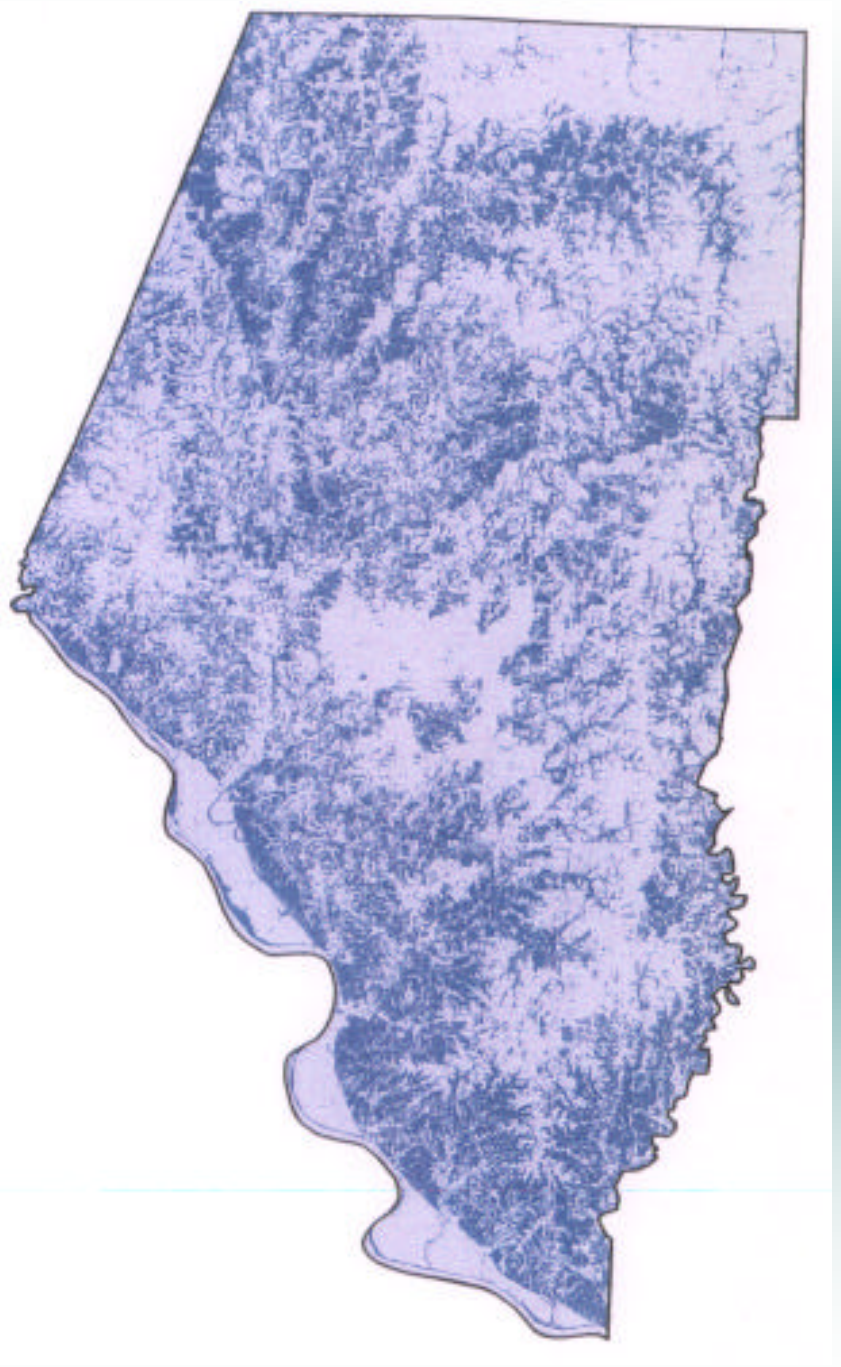


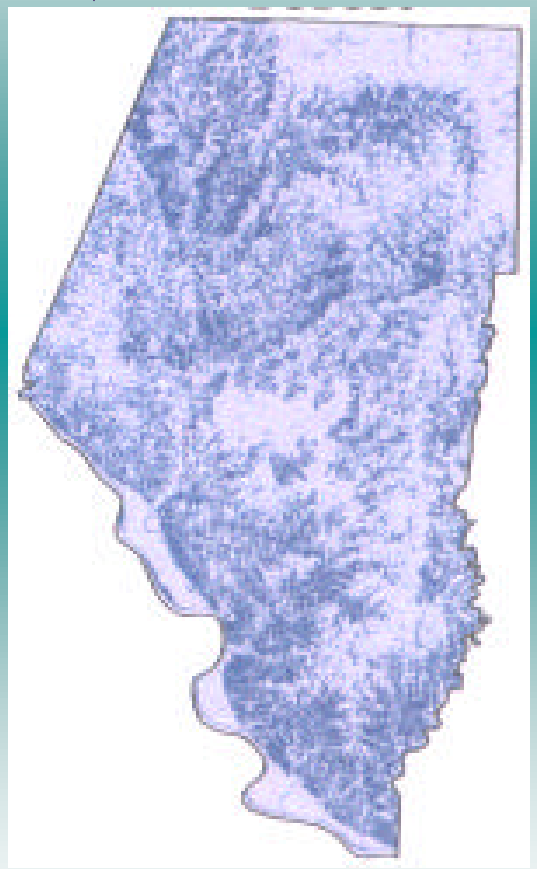


Get off of the web

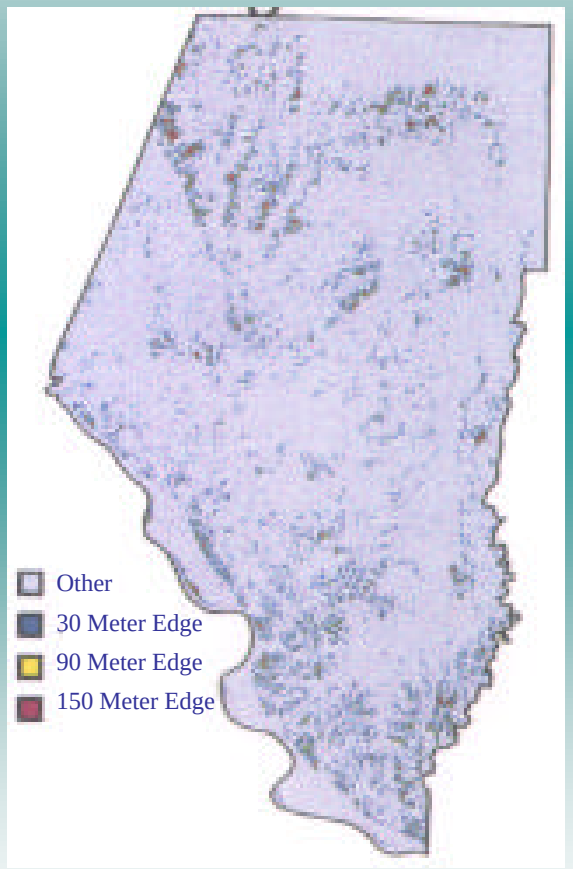
Ovenbird (Standard Model)



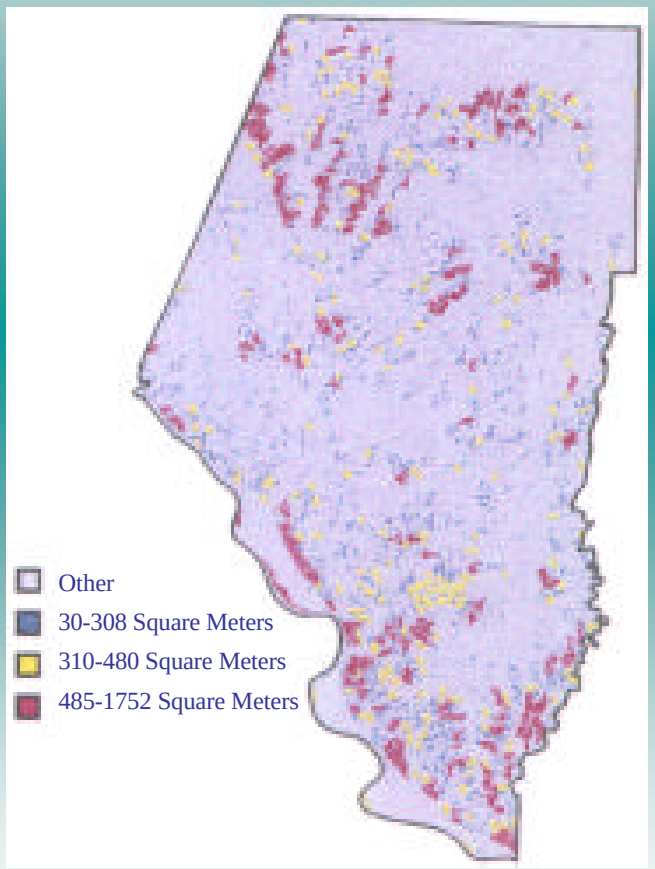
Ovenbird
(Missouri Model Components)



Forest



Edge Distance



Variable Areas

Ovenbird

(Zonalmean Process)

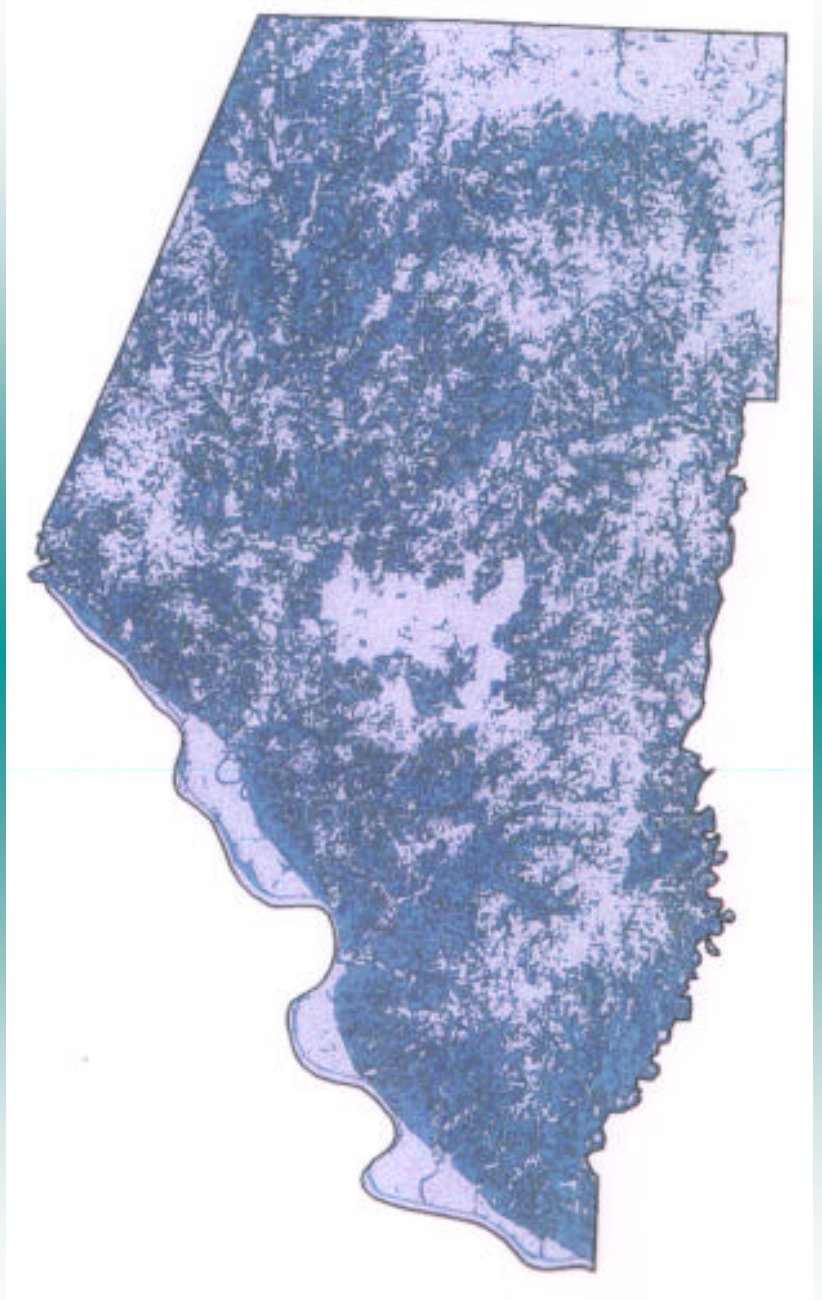
A **B** **C** **D**

Ovenbird

(Final Zonalmean Analysis)

Cooper's Hawk

(Missouri Model)



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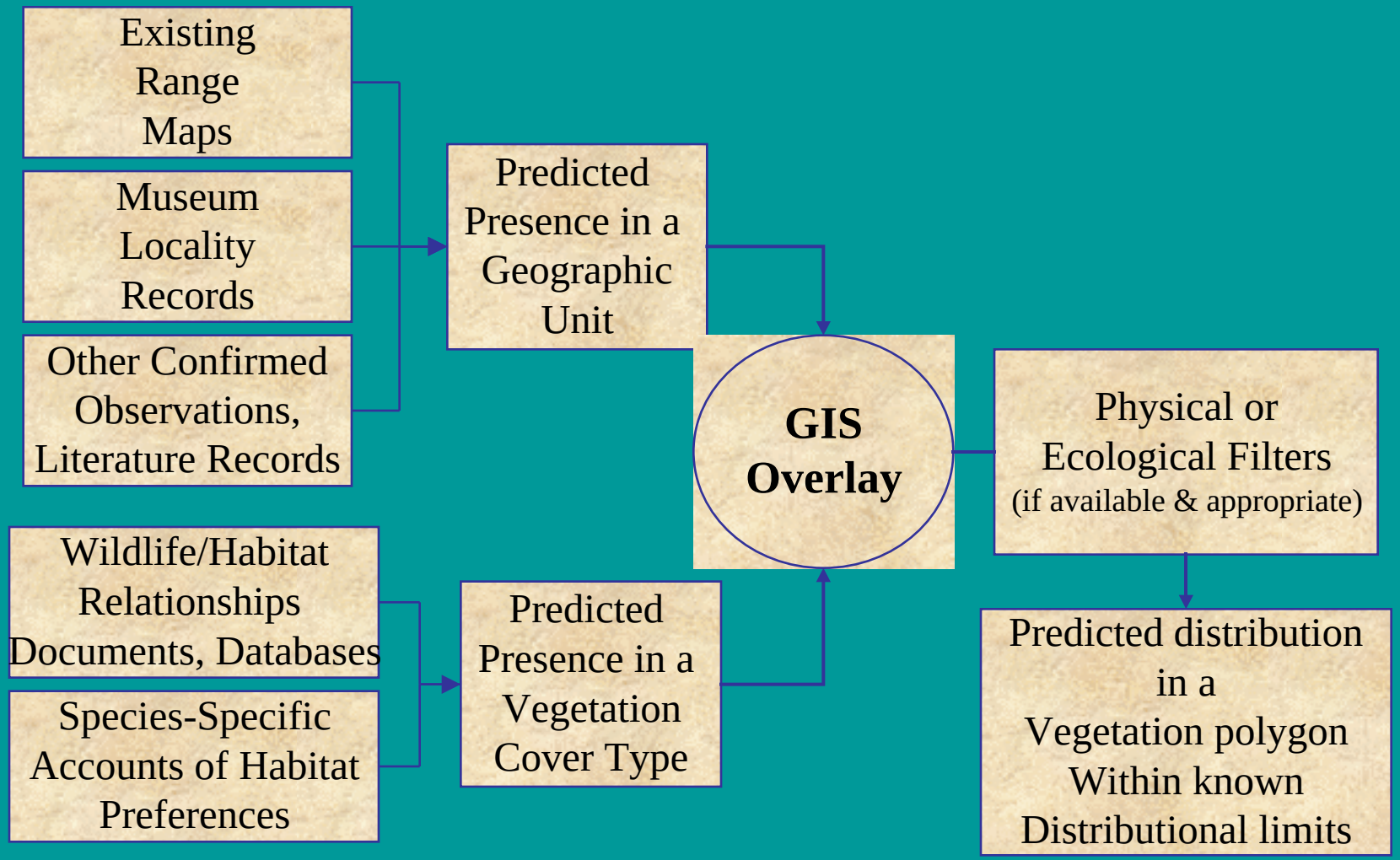
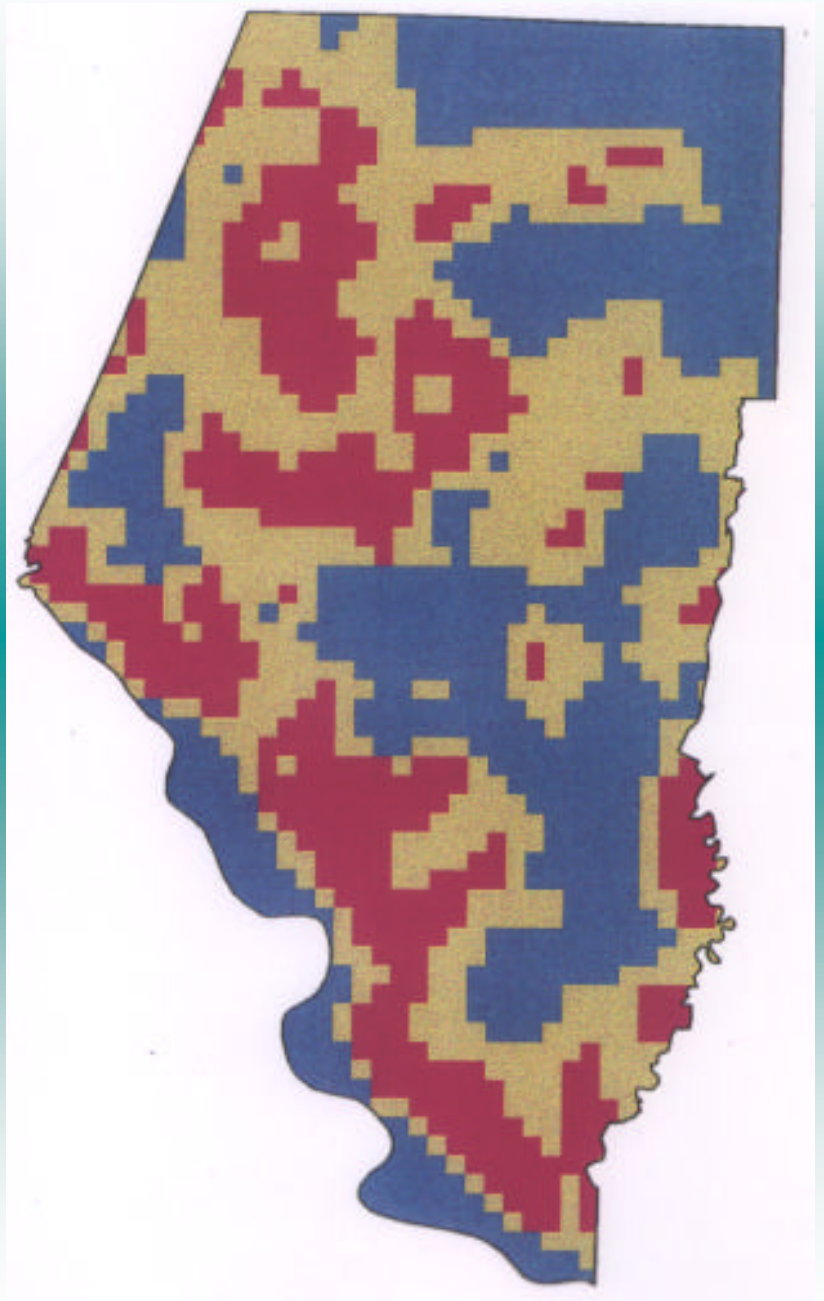
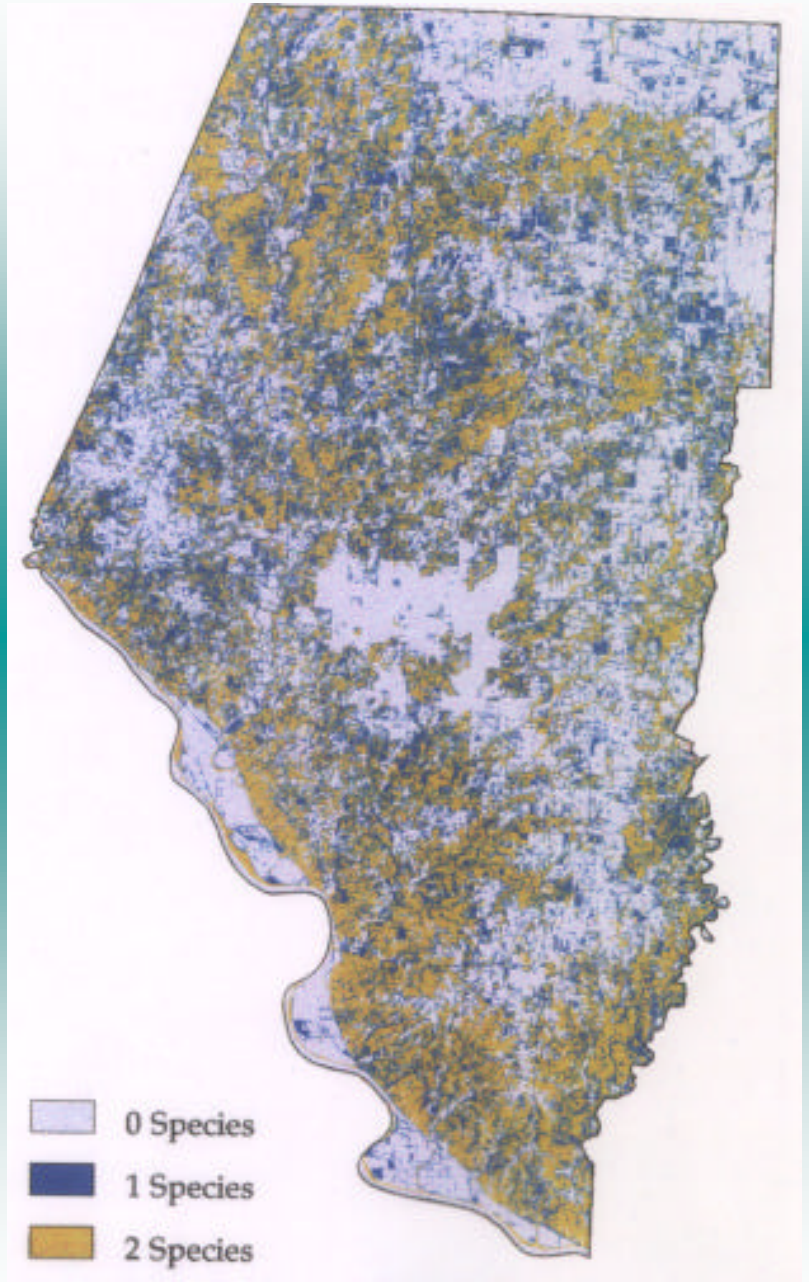


Cooper's Hawk Model



Species Richness



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