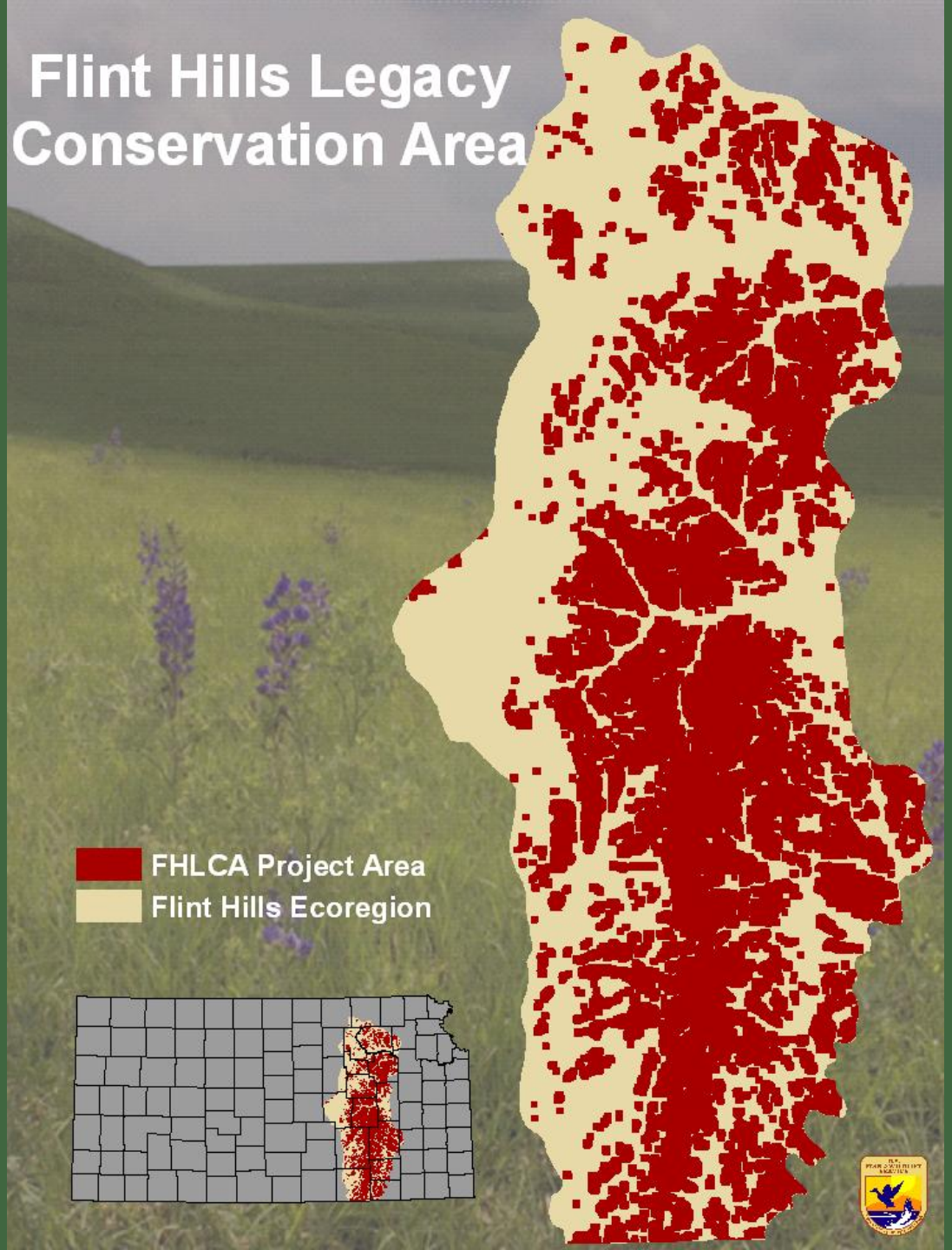
FLINT HILLS LEGACY CONSERVATION AREA

1.1 MILLION ACRE ACQUISTION APPROVAL



1.1 MILLION ACRE ACQUISTION APPROVAL

FLINT HILLS LEGACY CONSERVATION AREA:

Purposes of this briefing:

Address the requirement for "….a detailed briefing demonstrating application of the spatially-explicit processes of biological planning and conservation design…."

Address comments, concerns and expectations identified by Director Ashe during his 2010 visit to the project area.

CURRENT PPP APPROVAL MEMOS:

Detailed planning should:

"…demonstrate application of the spatially-explicit biological planning and conservation design that result in measurable biological outcomes."

FLINT HILLS LEGACY CONSERVATION AREA:

Concern

"Last of the Last Tallgrass Prairie"

"Last of the Last Everglades"
"Last of the Last Longleaf Pine"
"Last of the Last ……."

FLINT HILLS LEGACY CONSERVATION AREA:

"What are we getting out of this project?"

Priority Species?
Population Goals?
Habitat Goals?
Contribution to Range-wide Goals?

"FEDERAL TRUST SPECIES"

"MIGRATORY BIRDS AND ENDANGERED SPECIES"

PURPOSE OF FLINT HILLS LEGACY CONSERVATION AREA :

- "TALLGRASS PRAIRIE ECOSYSTEM"
- "GREATER PRAIRIE-CHICKEN"
- "RANCHERS"
- "ANTI-DEVELOPMENT"…urban sprawl, wind, oil…
- "FEDERAL TRUST SPECIES"

“Species Approach” vs “Ecosystem Approach”

Manage for ONE species
and all species will be fine

Manage for NO species
and all species will be fine

Landscapes Capable of Sustaining Range-wide Populations of Federal Trust Species at Socially Viable Levels

ALL SPECIES APPROACH:
AT LEAST ONE SPECIES AT A TIME

PURPOSE OF FLINT HILLS LEGACY CONSERVATION AREA EASEMENTS:

GRASSLAND EASEMENT
Targeting priority habitat for federal trust species

…migratory birds and endangered species

CONSERVATION EASEMENT
Targeting preservation of the "last of the last" of the tallgrass prairie ecosystem

…everything within a subjective boundary – all biotic, all abiotic and all interactions

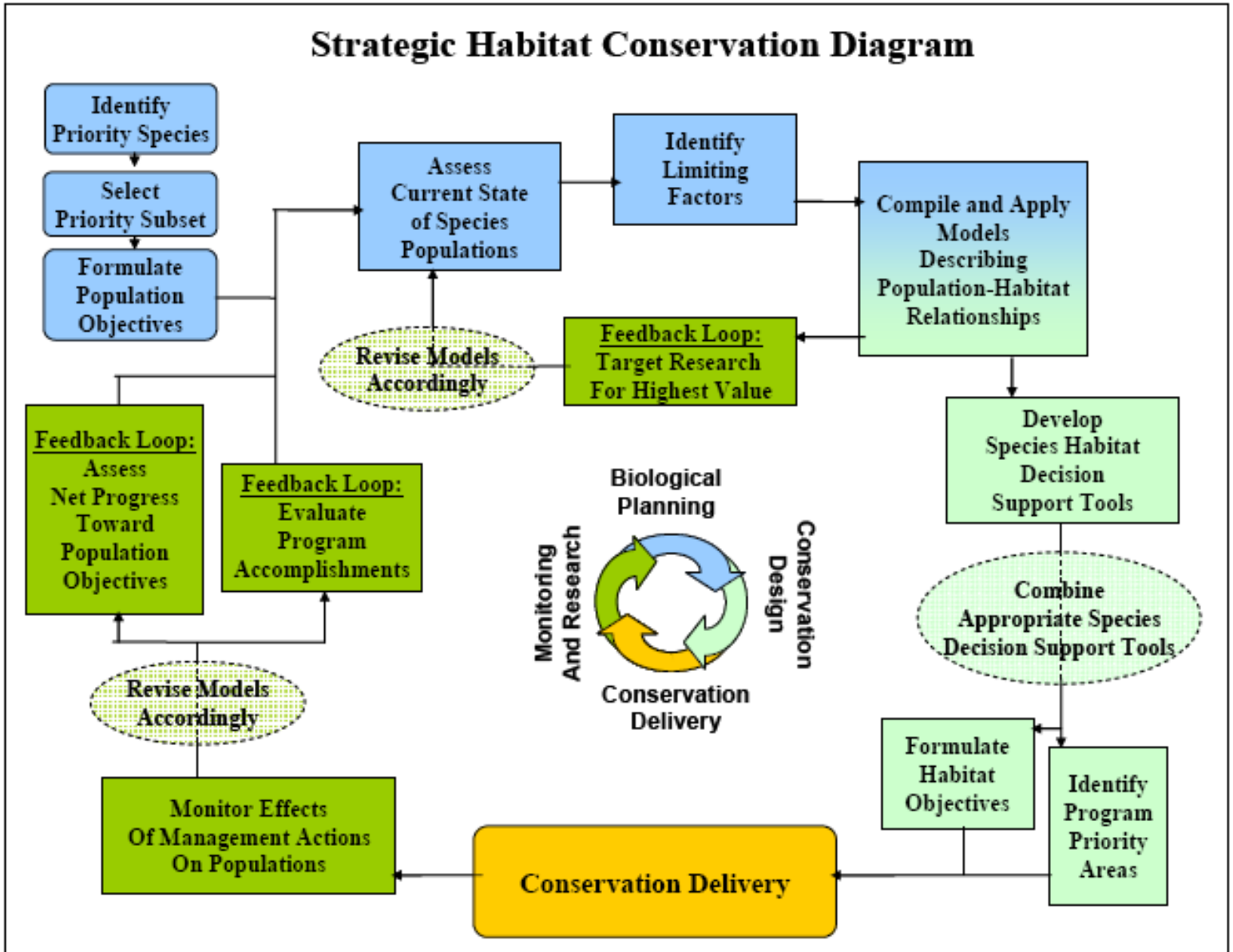
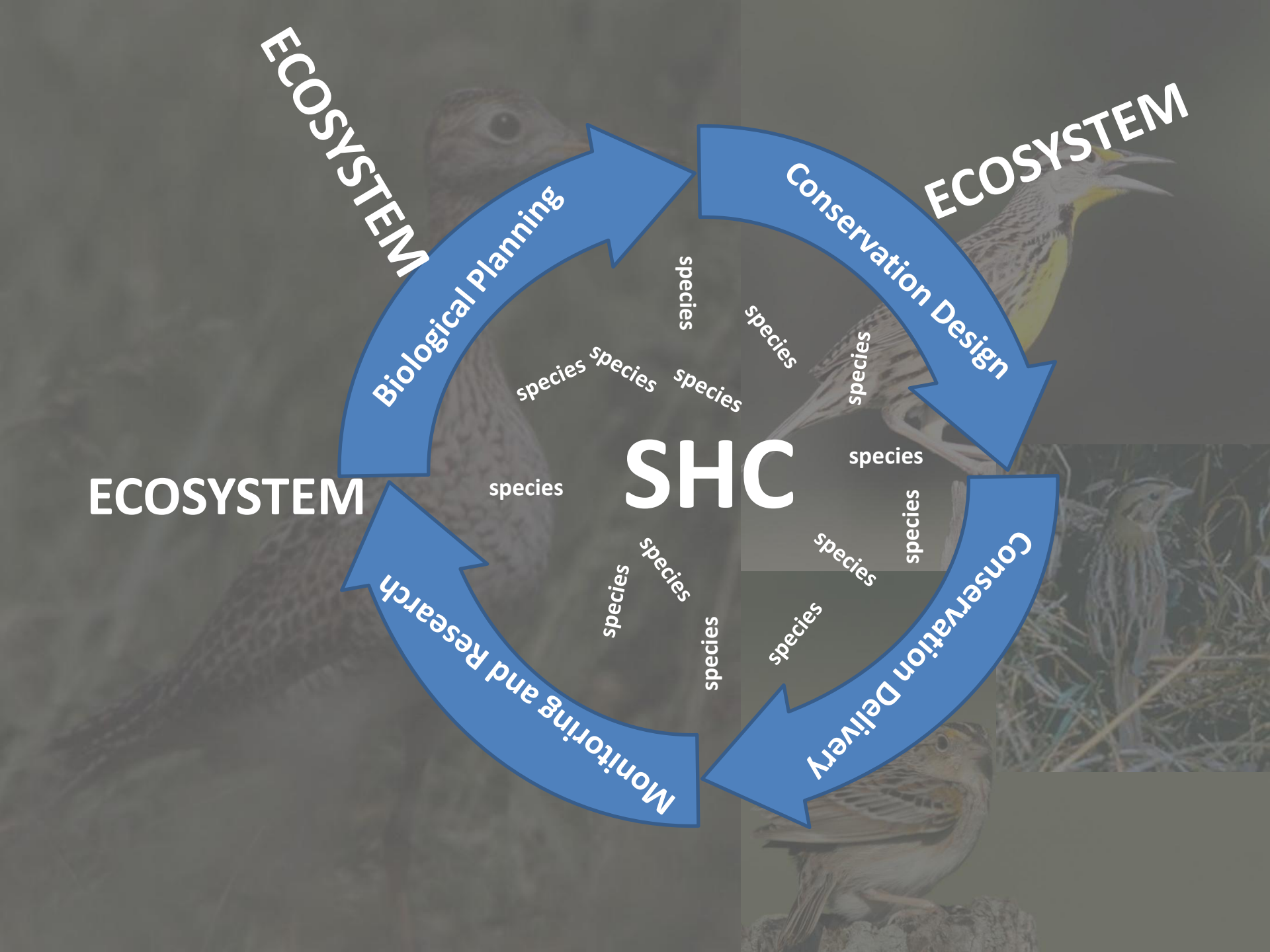
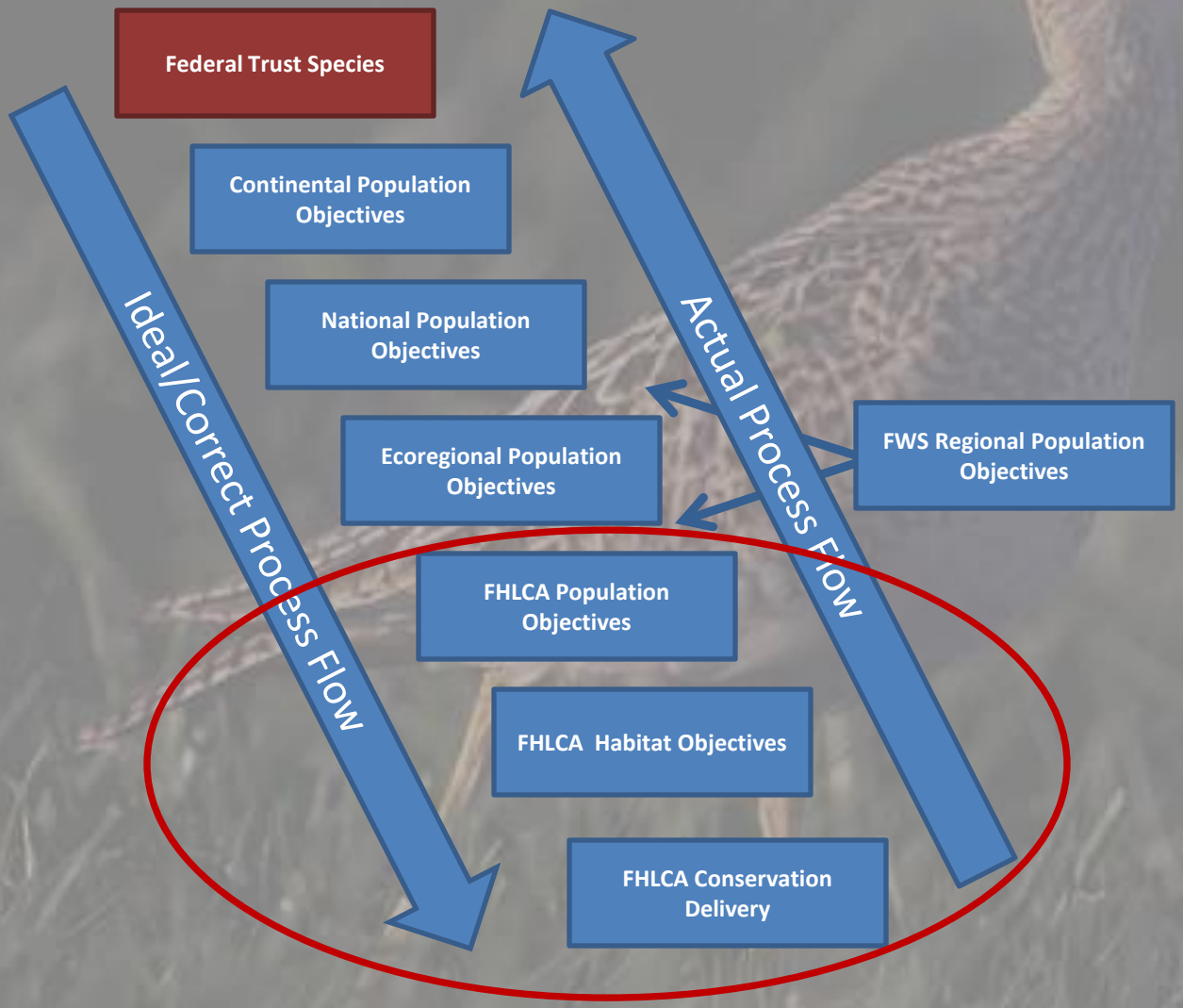


Figure 2. Schematic of the SHC framework at a landscape scale. Although depicted as a sequential process, some activities may occur simultaneously.


ECOSYSTEM
ECOSYSTEM
ECOSYSTEM
Biological Planning
Conservation Design
Conservation Delivery
Monitoring and Research
SHC
species

Provide Landscapes Capable of Sustaining Range-wide Populations of Federal Trust Species at Socially Viable Levels

How will FHLCA Contribute to this?



Identified an Ecoregion: Flint Hills

Identified Purpose: Tallgrass Prairie Ecosystem

Identified Problem: Fragmentation (woody invasion, wind, urban etc)

Identified a Treatment: Conservation Easements

Defined Conservation Goal: 1 million acres

Defined the Project Area: 1.9 million acres

Refined Project Area: 3.3 million acres

Refined Conservation Goal: 1.1 million acres

PROJECT APPROVED *

Identified spp which occur in area

Greater prairie-chicken (umbrella)

Birds of Cons. Concern (BCRs, R6, US, BBS)

* Pending briefing to the Director

Demonstrate "…application of the spatially-explicit processes of biological planning and conservation design…."

Address comments, concerns and expectations identified by DIRECTOR Ashe during his 2010 visit to the project area.

3.3 MILLION ACRE PROJECT AREA

1.1 MILLION ACRE ACQUISTION APPROVAL

LANDSCAPE LEVEL, MODEL BASED APPROACH TARGETED AT IDENTIFYING AND ADDRESSING POPULATION LIMITING FACTORS FOR PRIORITY SPECIES

Minimal Basic Data Needs:

- Habitat (Landcover/Wetland*)
- Spatially Explicit Biological Data
- Conservation Estate*

Sources of Data:

- Determine Availability
- Assess Quality of Existing Data
- Use as-is or Post Process to Suitable Form
- Create if Necessary (develop protocols, methods, standards, design, acquire funding)

HABITAT DATA

National Landcover Dataset

"Therefore, users are advised that the NLCD is not recommended for local scale analyses"

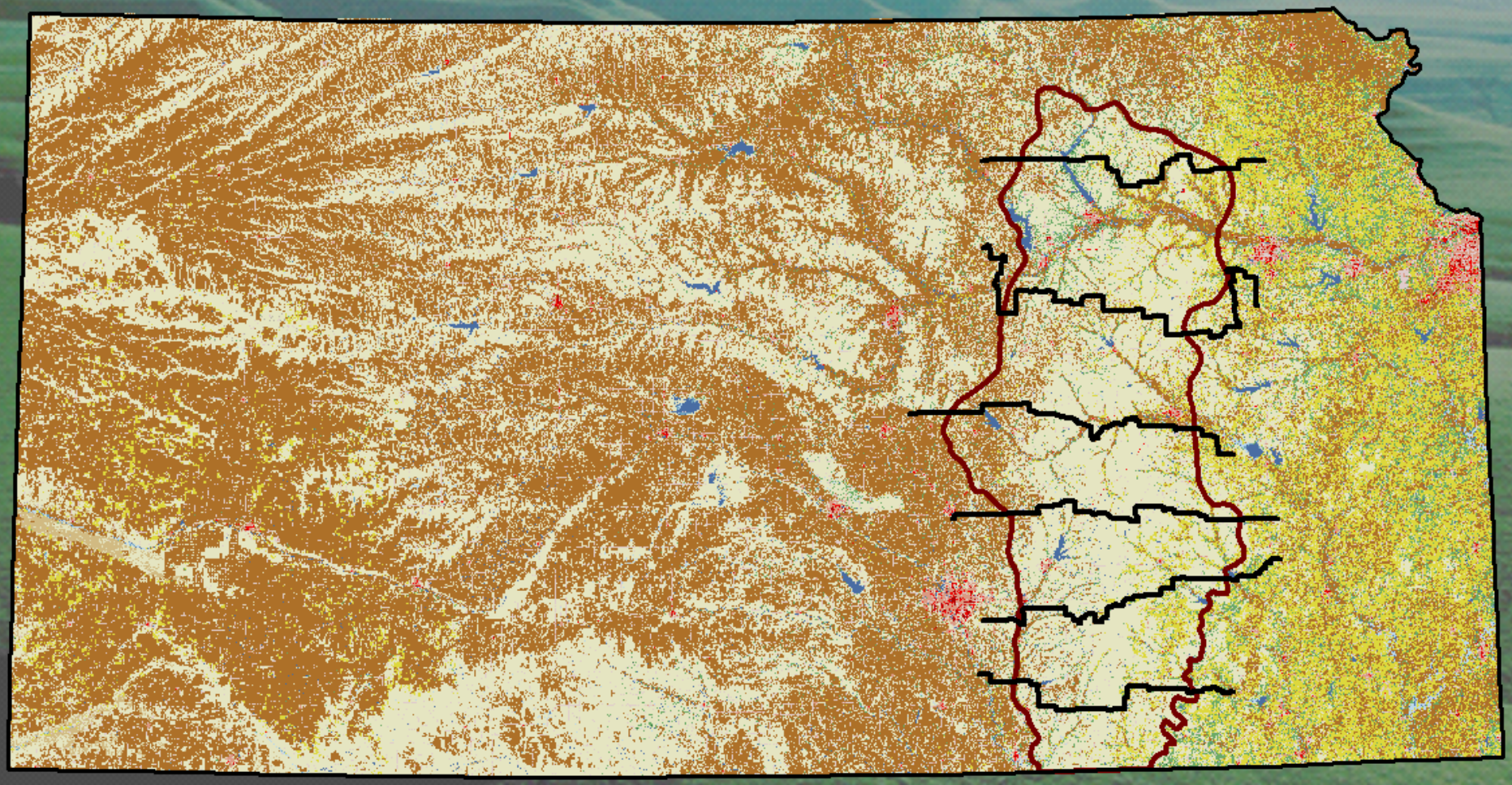
- Vogelmann et al. (2001)

"Also, even though NLCD is intended as a regional- to national- level product, Vogelmann et al. (2001) reported that approximately 50 percent of NLCD's users were applying the data at a state or sub-state (state region, county, or watershed) level."

- Wardlow and Egbert (2003)

Barren Land
Cultivated Crops
Deciduous Forest
Developed, High Intensity
Developed, Low Intensity
Developed, Medium Intensity
Developed, Open Space
Emergent Herbaceuous Wetlands
Evergreen Forest
Grassland/Herbaceuous
Hay/Pasture
Mixed Forest
Open Water
Shrub/Scrub
Woody Wetlands
Flint Hills Ecoregion

FLINT HILLS ACCURACY ASSESSMENT: NLCD 2001



- Barren Land
- Cultivated Crops
- Deciduous Forest
- Developed, High Intensity
- Developed, Low Intensity
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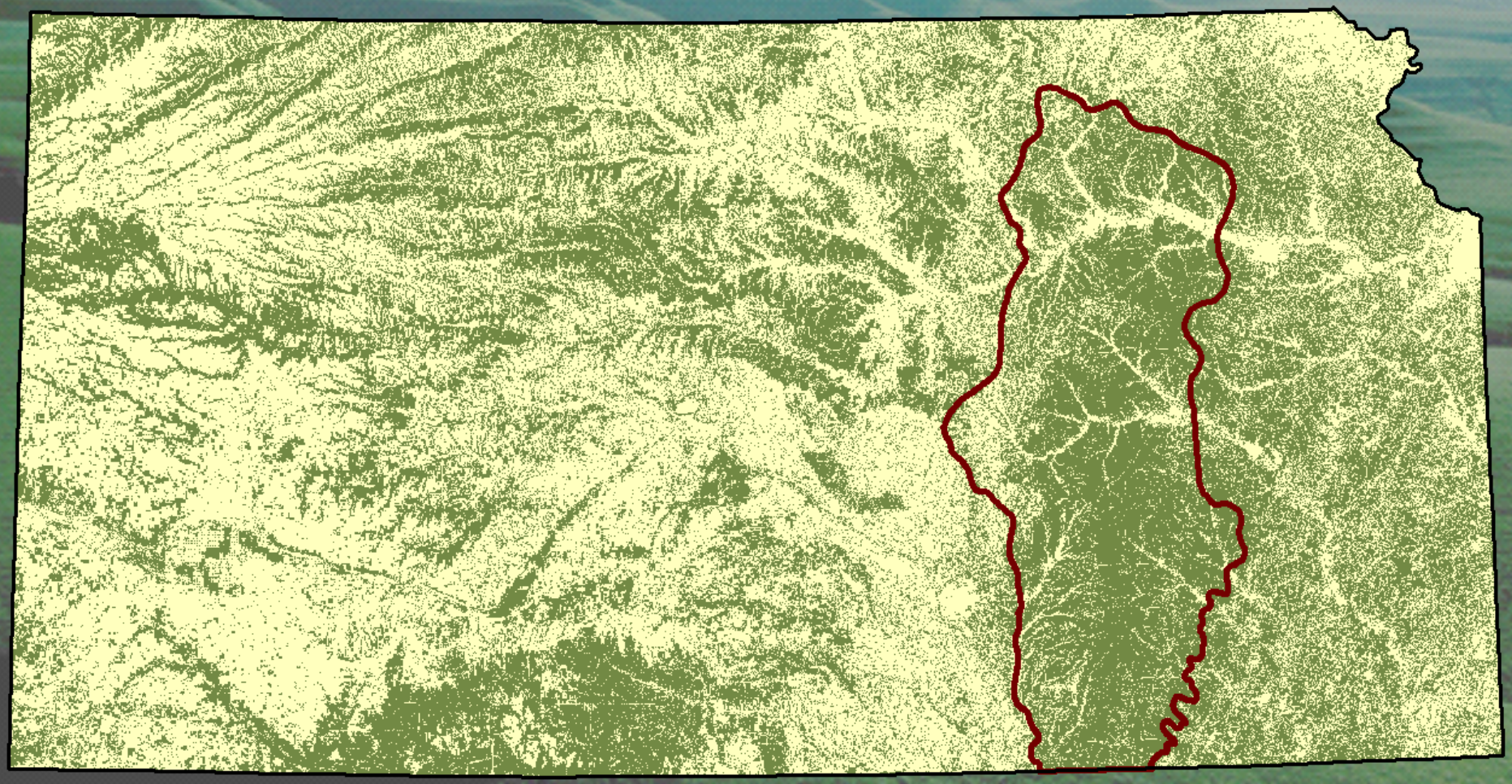
- Flint Hills Ecoregion

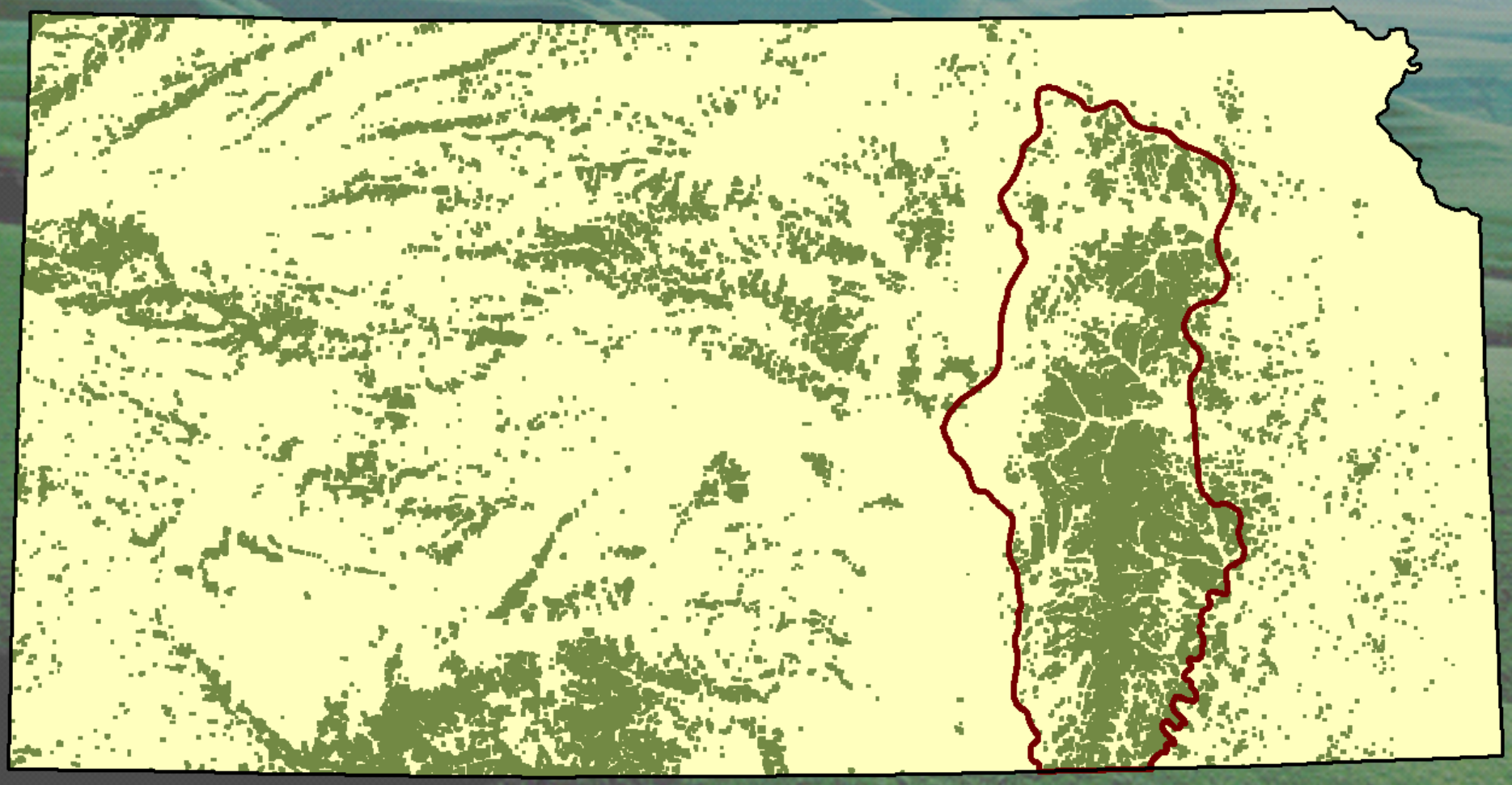
NLCD 2001



Grassland (24 million ac, 46%)
Non-Grassland (28.7 million ac.)
Flint Hills Ecoregion

24 Million Acres Grass (46% of KS)

NLCD 2001

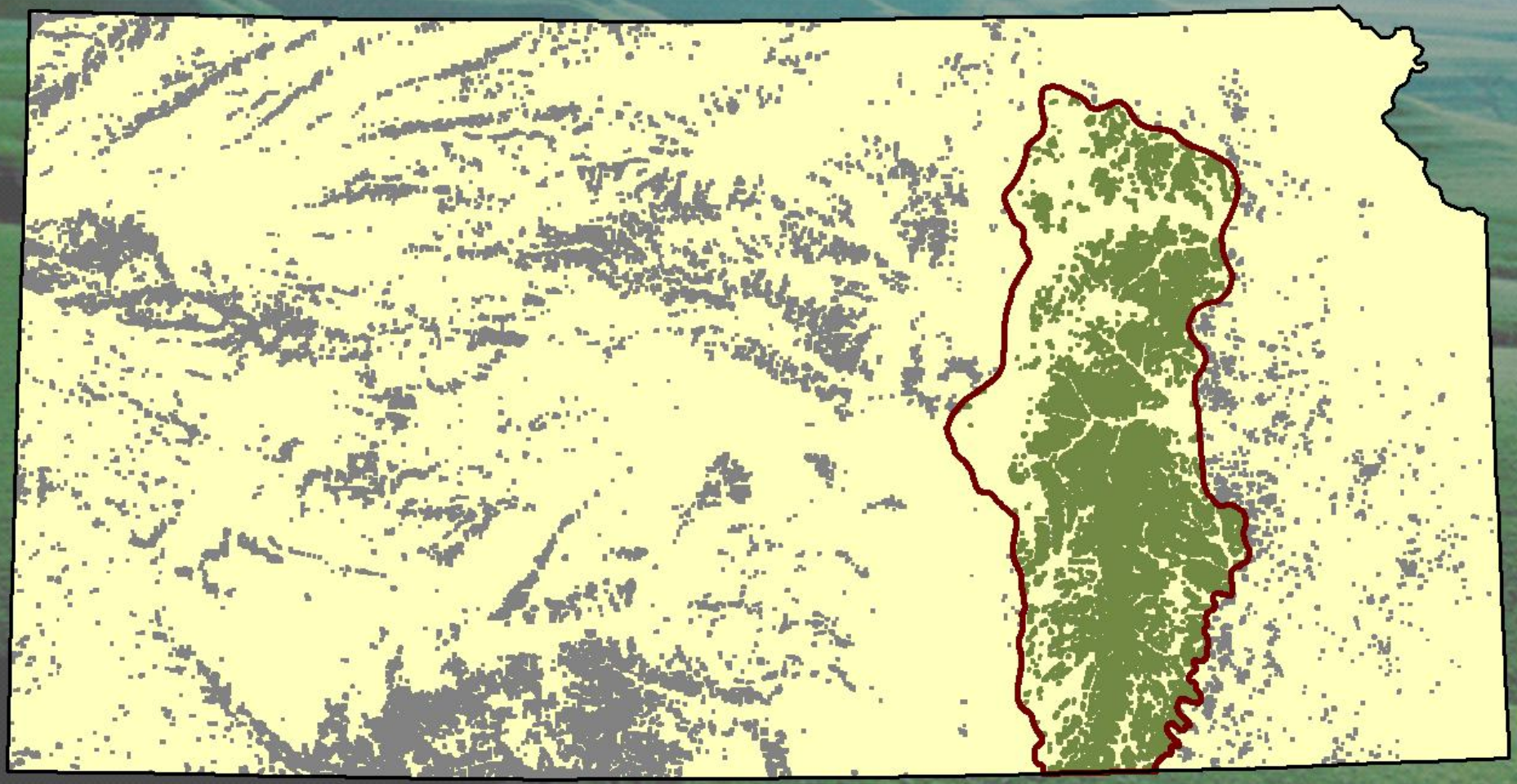


>95% Grassland in 800m radius (11.7 million ac.)

Flint Hills Ecoregion

11.7 Million Acres
“Intact Grass”

NLCD 2001

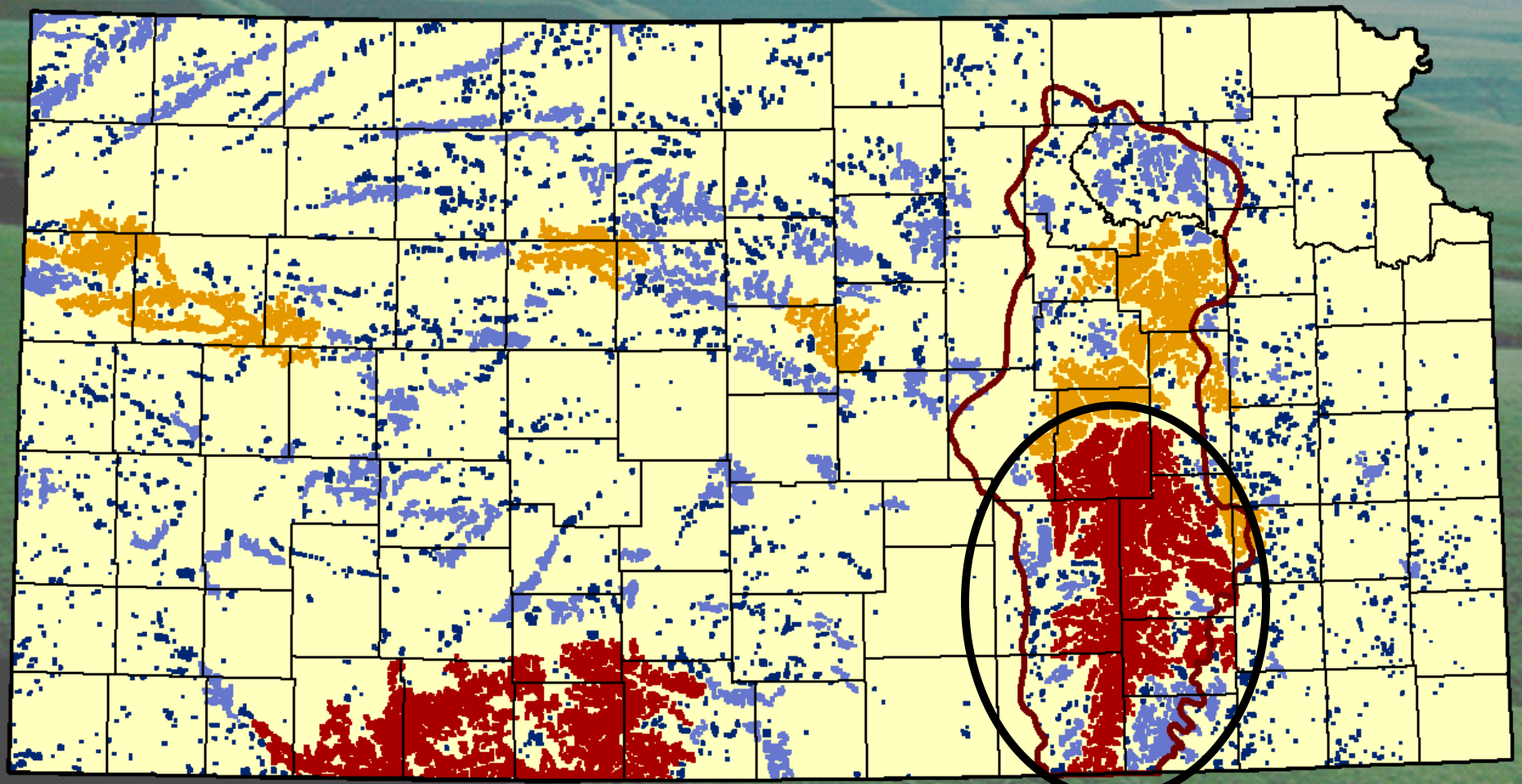


>95% Grassland in 800m radius (3.3 million ac.)

Flint Hills Ecoregion

3.3 Million Acres
Flint Hills "Intact Grass"

NLCD 2001

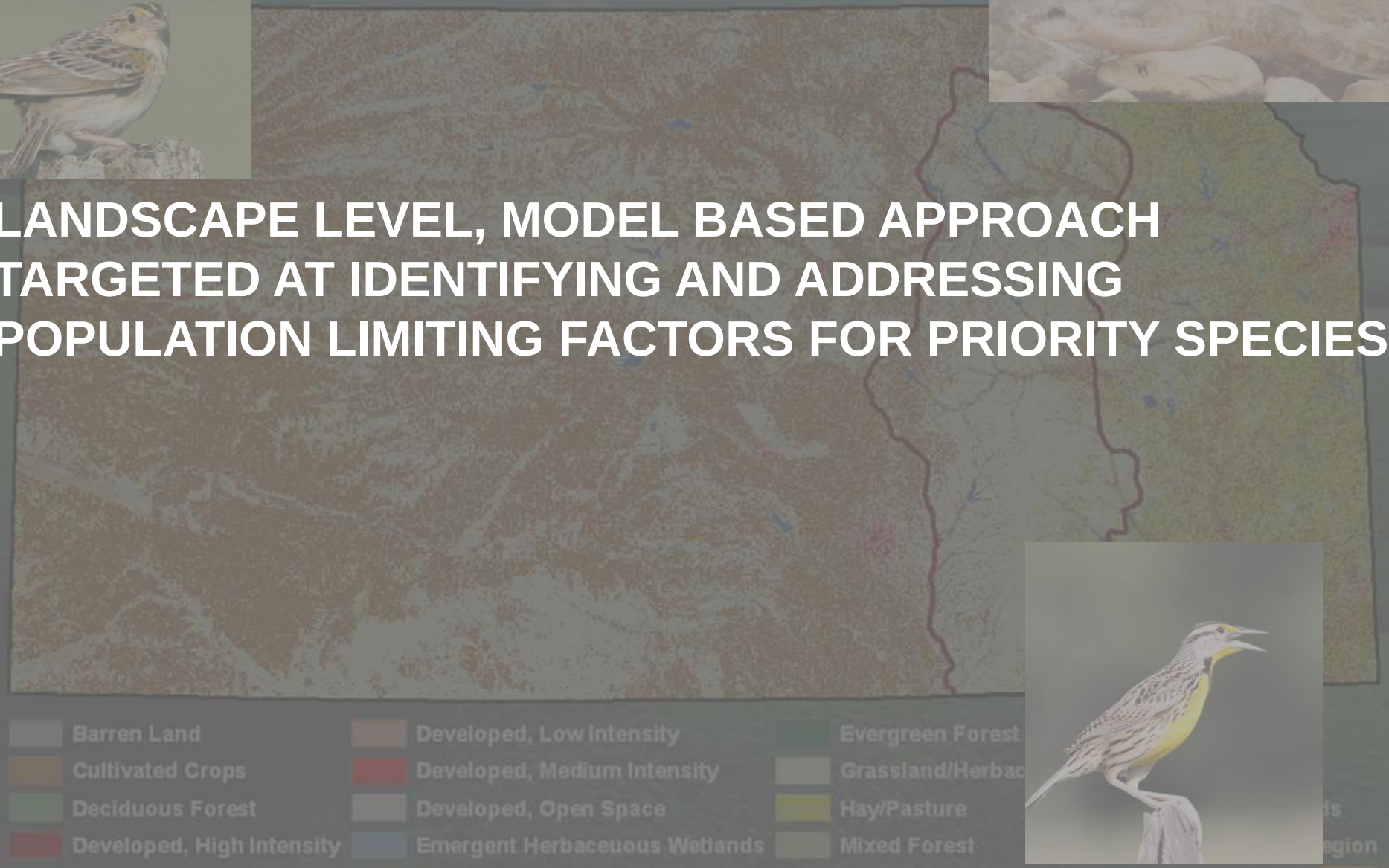


Patch Size (>95% Grassland in 800m radius)

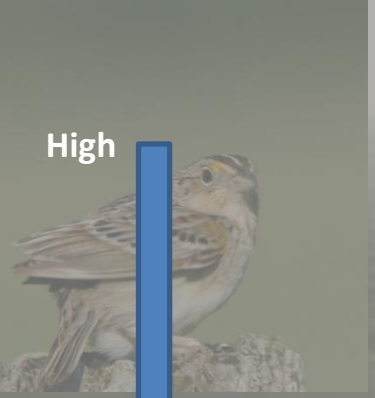
- < 10,000 ac.
- 10,000 - 100,000 ac.
- 100,000 - 1,000,000 ac.
- > 1,000,000 ac.
- Flint Hills Ecoregion

MODELING APPROACH

LANDSCAPE LEVEL, MODEL BASED APPROACH TARGETED AT IDENTIFYING AND ADDRESSING POPULATION LIMITING FACTORS FOR PRIORITY SPECIES



TYPES OF MODELS DIFFER



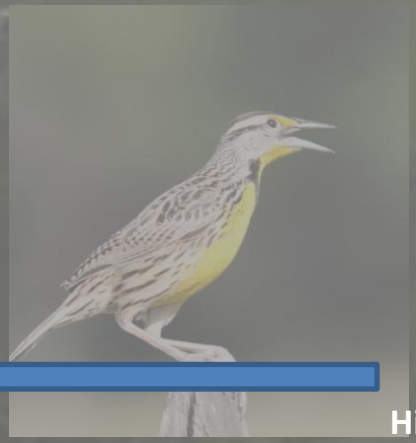
Long-Term Population Performance

Demographic Performance

Density

Presence

Presence/Absence



High

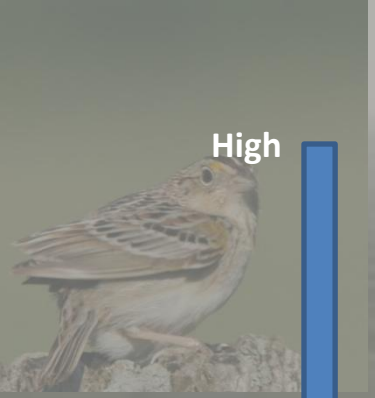
Cost

Low

Usefulness

High

Model Development



High

Cost

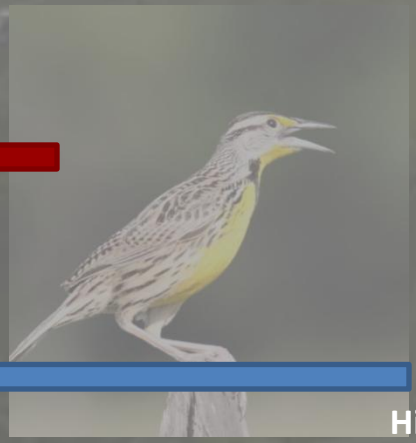
Develop Empirical Models From New Data

Develop Empirical Models From Existing Data

Apply Existing Empirical Models

Develop Conceptual Models

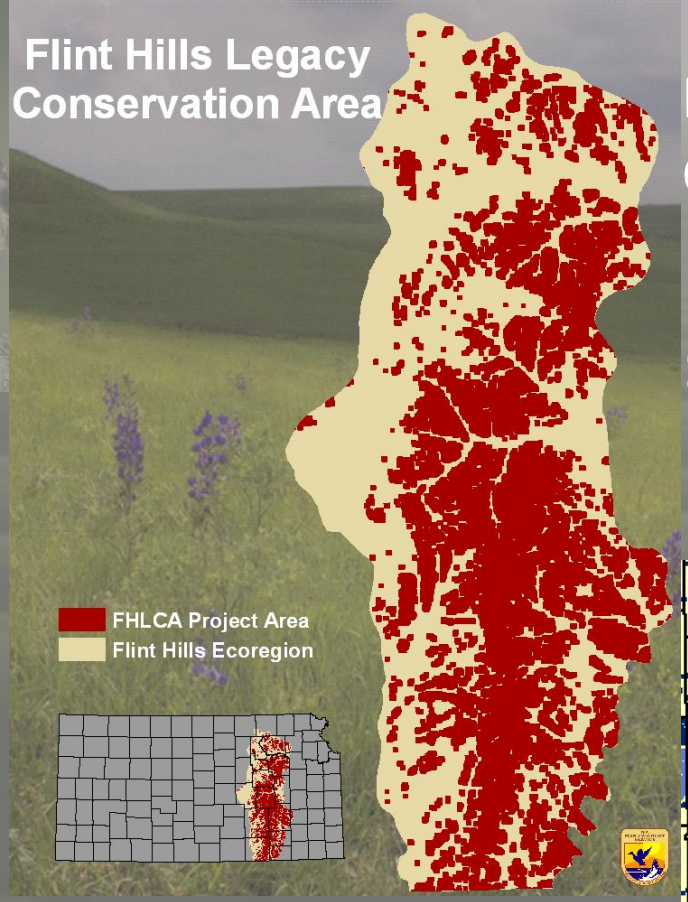
~~Draw Focus Areas on a Map~~



Low

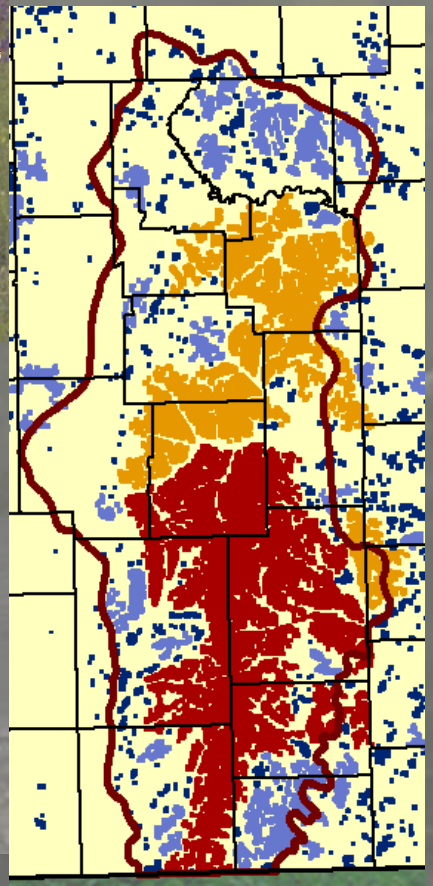
High

Completion Time



Project Area is a Conceptual Model

>95% Grass in 800m Landscape



BIOLOGICAL DATA: PRIORITY SPECIES

NEAT REPORT:

On Priority Species: "…we have an obligation to benefit trust species first and foremost"

On Selection a Subset of Priority Species: "…criteria may include a number of legal, social, and biological factors..."

Use of focal species is a shortcut with associated assumptions and risks

Key Assumptions:

- **Addressing the limiting factors for focal species will also address the limiting factors for other species in the guild**

- **Habitat goals for focal species will meet the needs for other species in the guild**

NOT JUST THAT THEY LIVE IN THE SAME AREA AND USE SIMILAR HABITATS

MIGRATORY BIRDS

Migratory Bird Priority (breeding)

- Declining Population Trend (BBS)
- High BBS Abundance
- Some Indication that Populations are Limited on Breeding Grounds
- Other?

Migratory Bird Priority (wintering)

- Declining Population Trend (BBS)
- Some Indication Populations are Limited on Wintering Grounds
- Other?

Migratory Bird Priority (migration)

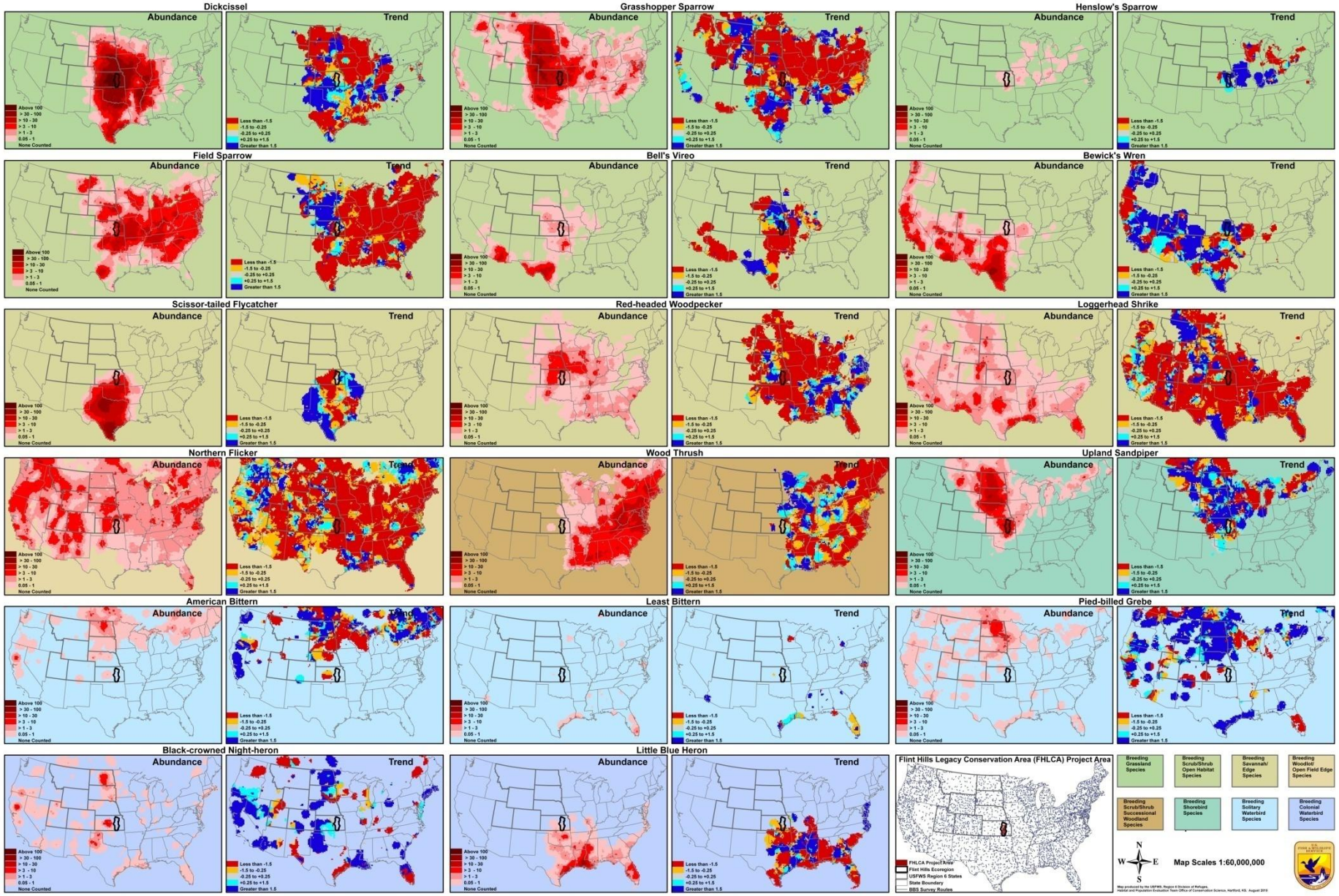
- Declining Population Trend (BBS)
- Some Indication Populations are Limited During Migration
- Other?

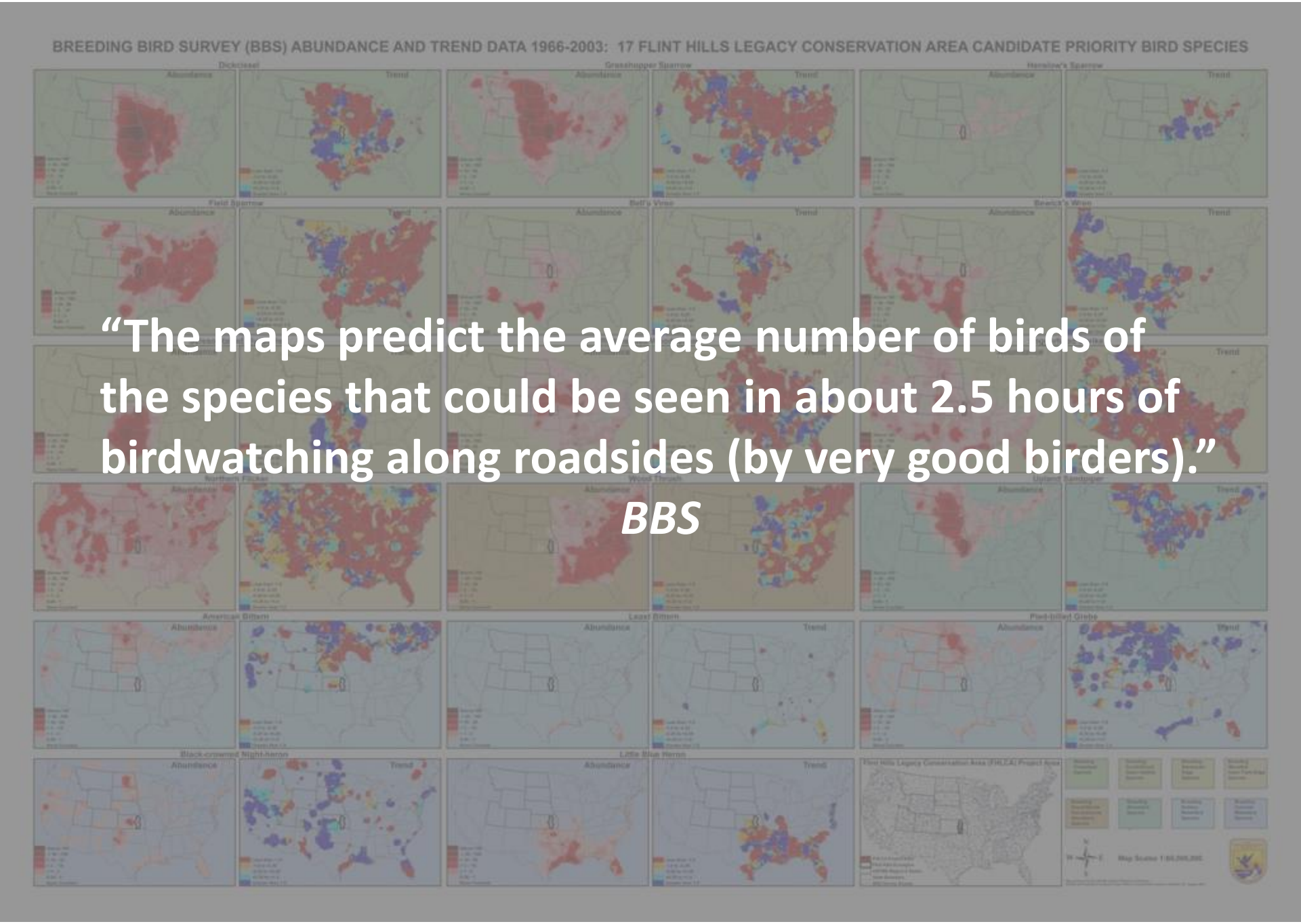
Focus on Breeding Migratory Birds

- All are born, and most die, on the breeding grounds (population limiting factors occur here)
- BBS data are available going back to 1966 – Current (long term, well designed, demonstrated usefulness)
- Easier to monitor and understand on the breeding grounds (they sit still longer)

Breeding Bird Survey (BBS) Routes: Lower 48

BREEDING BIRD SURVEY (BBS) ABUNDANCE AND TREND DATA 1966-2003: 17 FLINT HILLS LEGACY CONSERVATION AREA CANDIDATE PRIORITY BIRD SPECIES



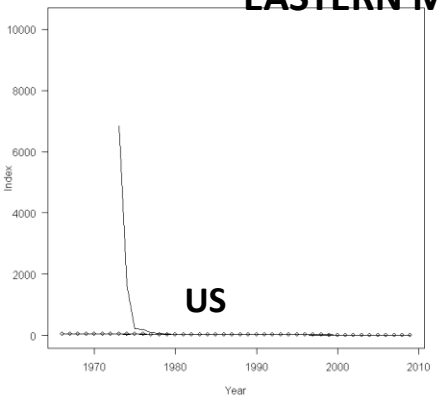


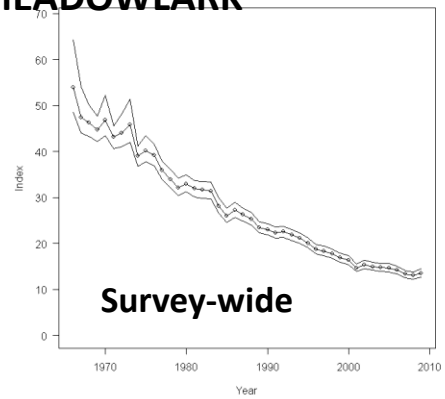
"The maps predict the average number of birds of the species that could be seen in about 2.5 hours of birdwatching along roadsides (by very good birders)."

BBS

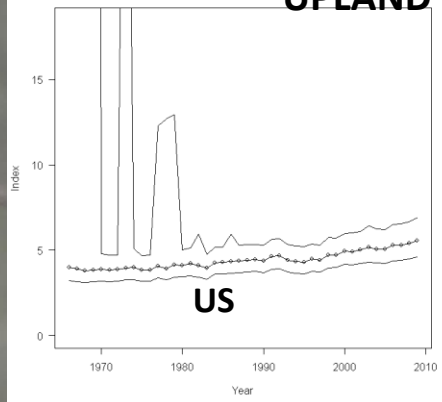
BBS TREND 1966-2009

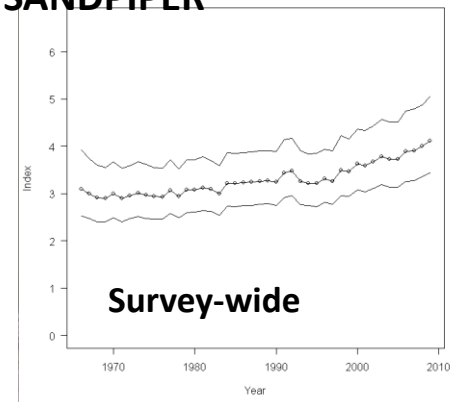
EASTERN MEADOWLARK



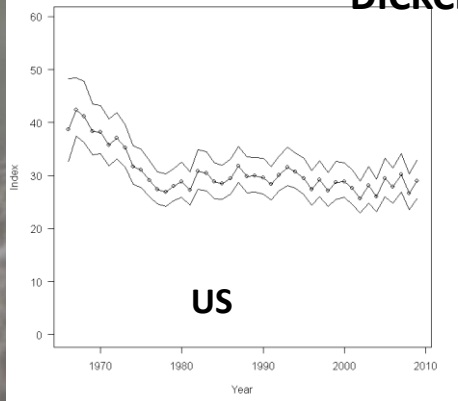


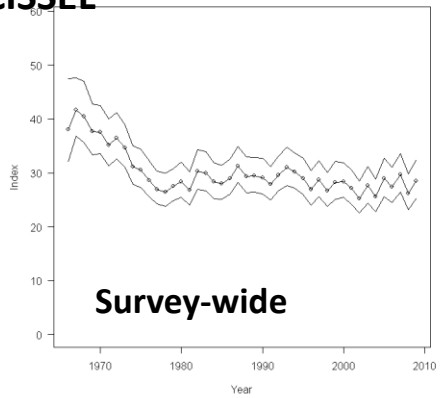
UPLAND SANDPIPER



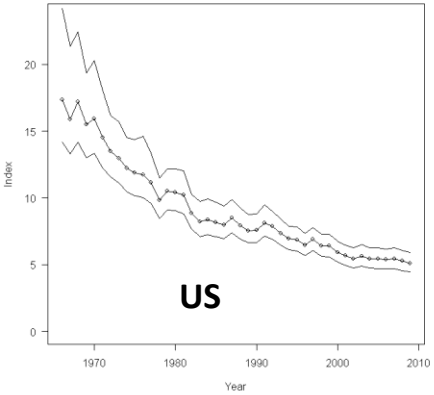


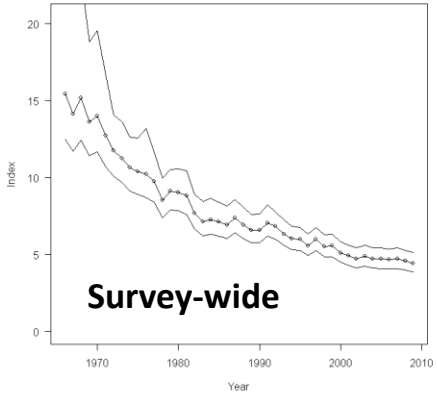
DICKCISSEL



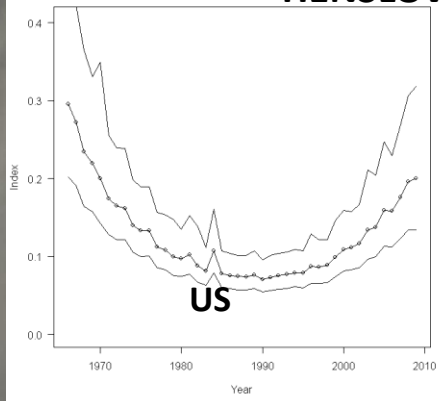


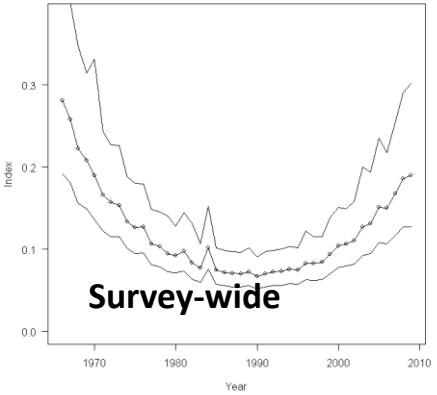
GRASSHOPPER SPARROW

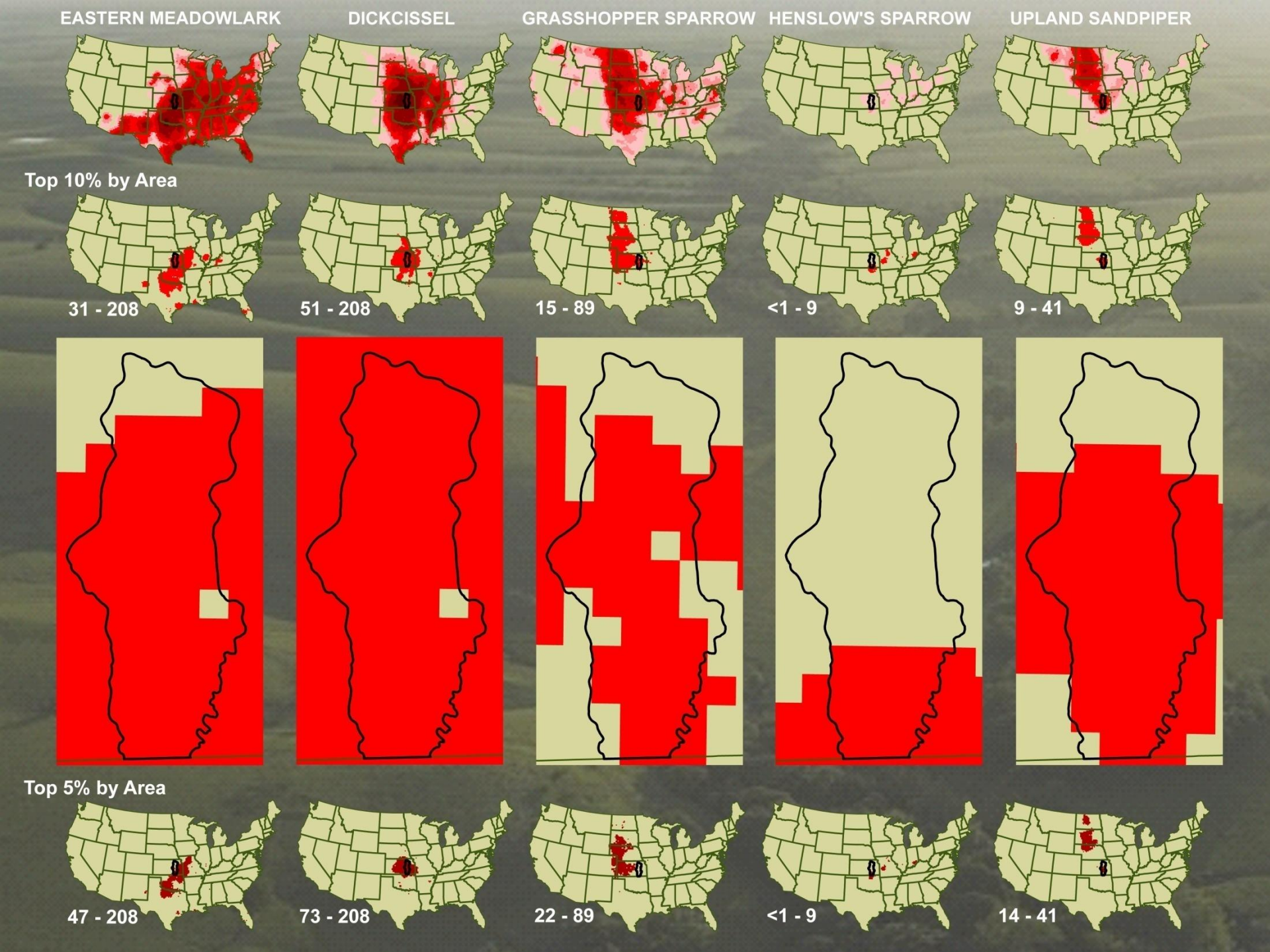


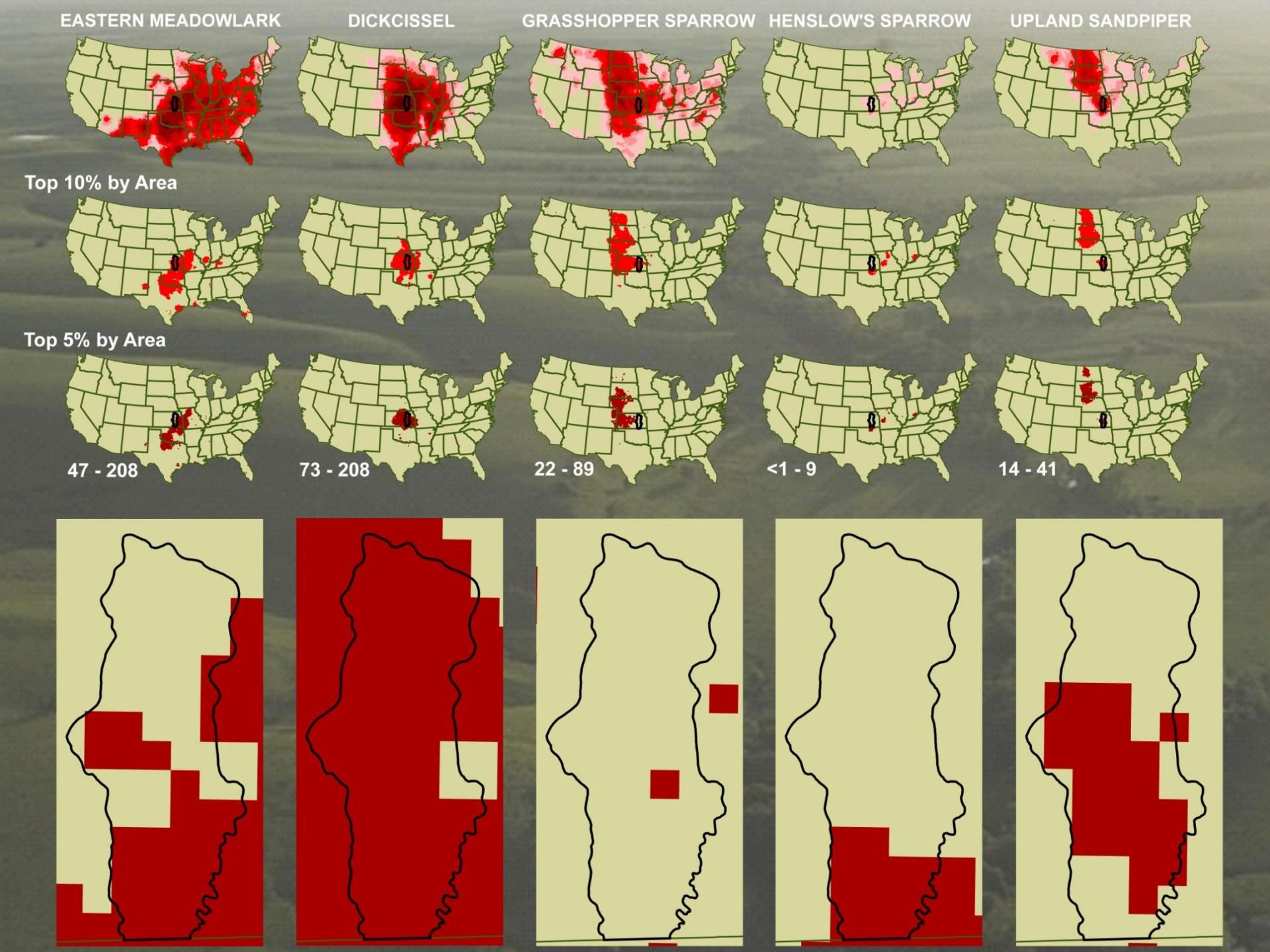


HENSLOW'S SPARROW






EASTERN MEADOWLARK
DICKCISSEL
GRASSHOPPER SPARROW
HENSLOW'S SPARROW
UPLAND SANDPIPER
Top 10% by Area
31 - 208
51 - 208
15 - 89
<1 - 9
9 - 41
Top 5% by Area
47 - 208
73 - 208
22 - 89
<1 - 9
14 - 41


EASTERN MEADOWLARK
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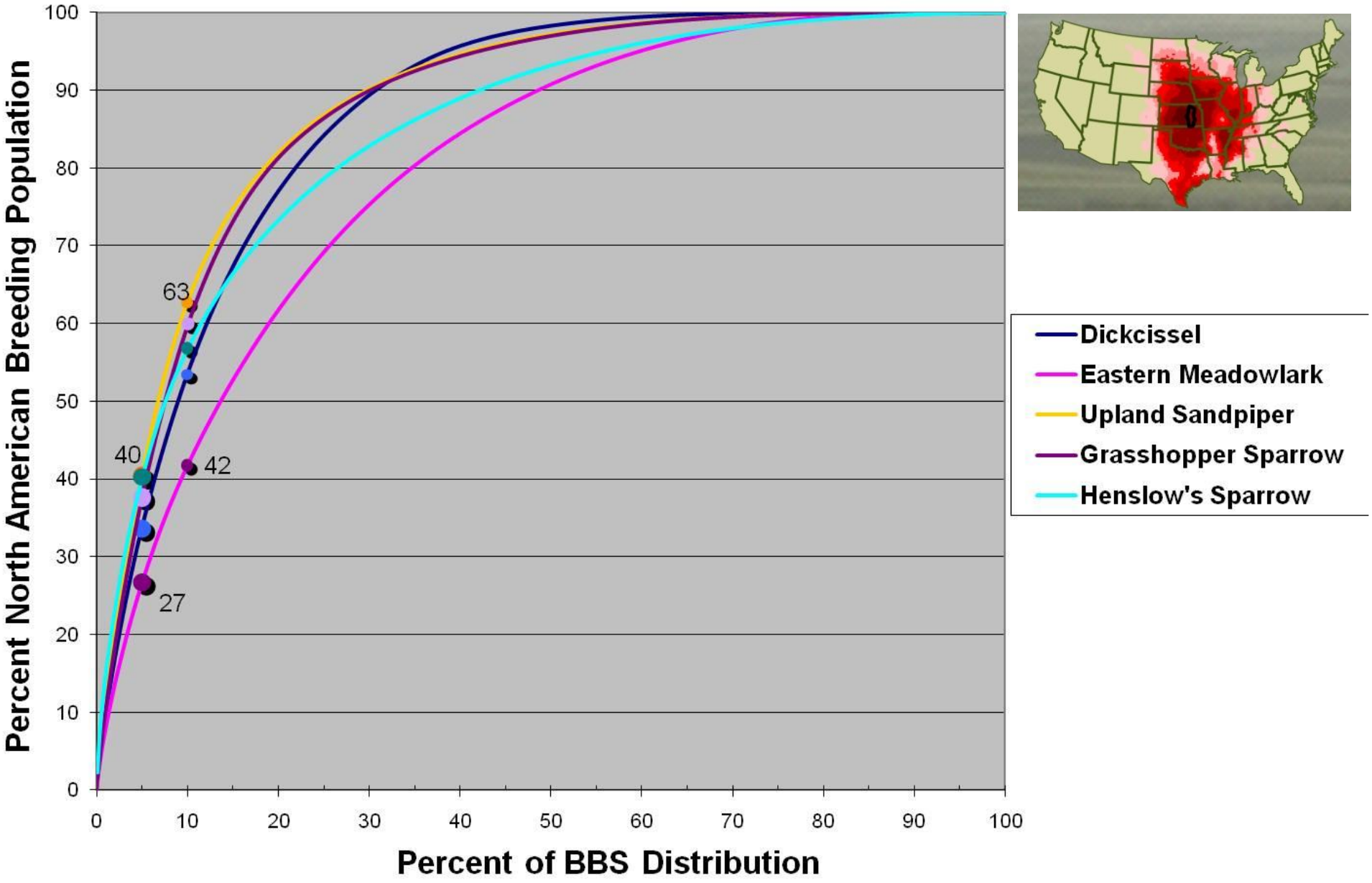
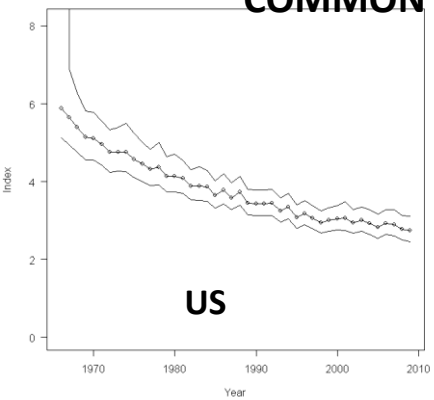
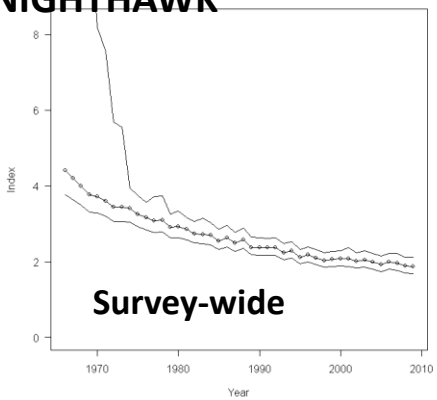

Percent North American Breeding Population
Percent of BBS Distribution
0
10
20
30
40
50
60
70
80
90
100
63
40
42
27
Dickcissel
Eastern Meadowlark
Upland Sandpiper
Grasshopper Sparrow
Henslow's Sparrow

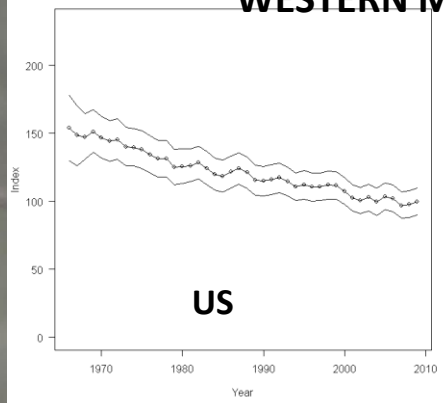
BBS TREND 1966-2009

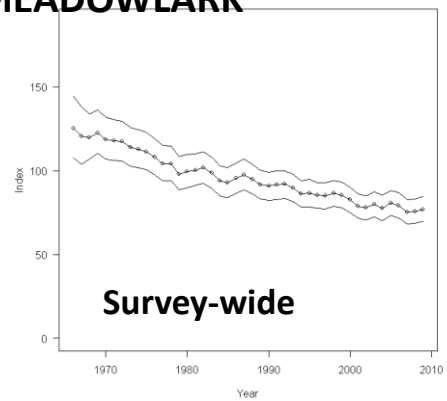
COMMON NIGHTHAWK



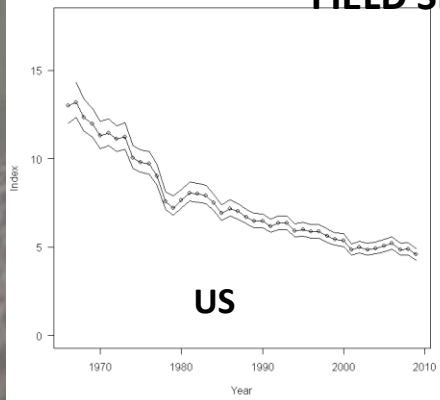


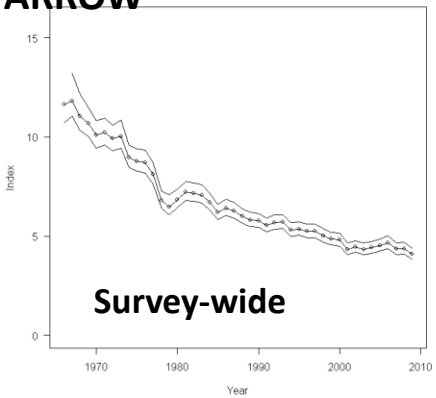
WESTERN MEADOWLARK



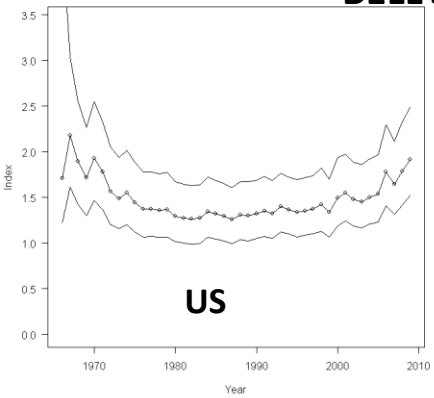


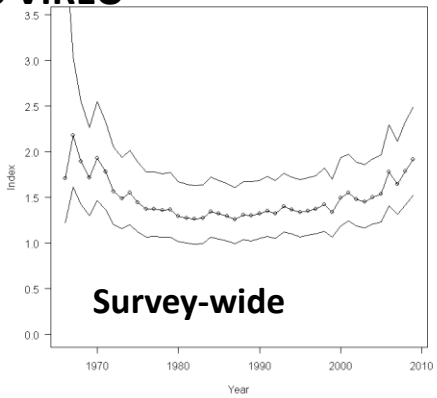
FIELD SPARROW



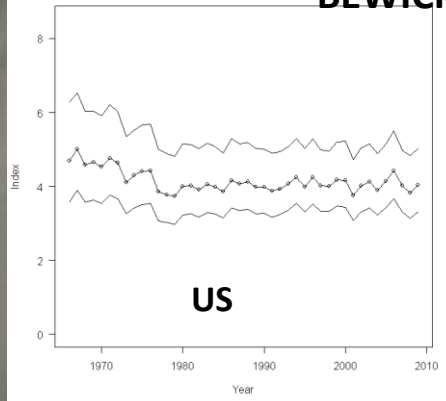


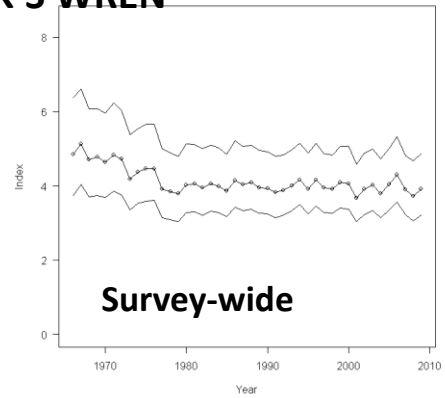
BELL'S VIREO

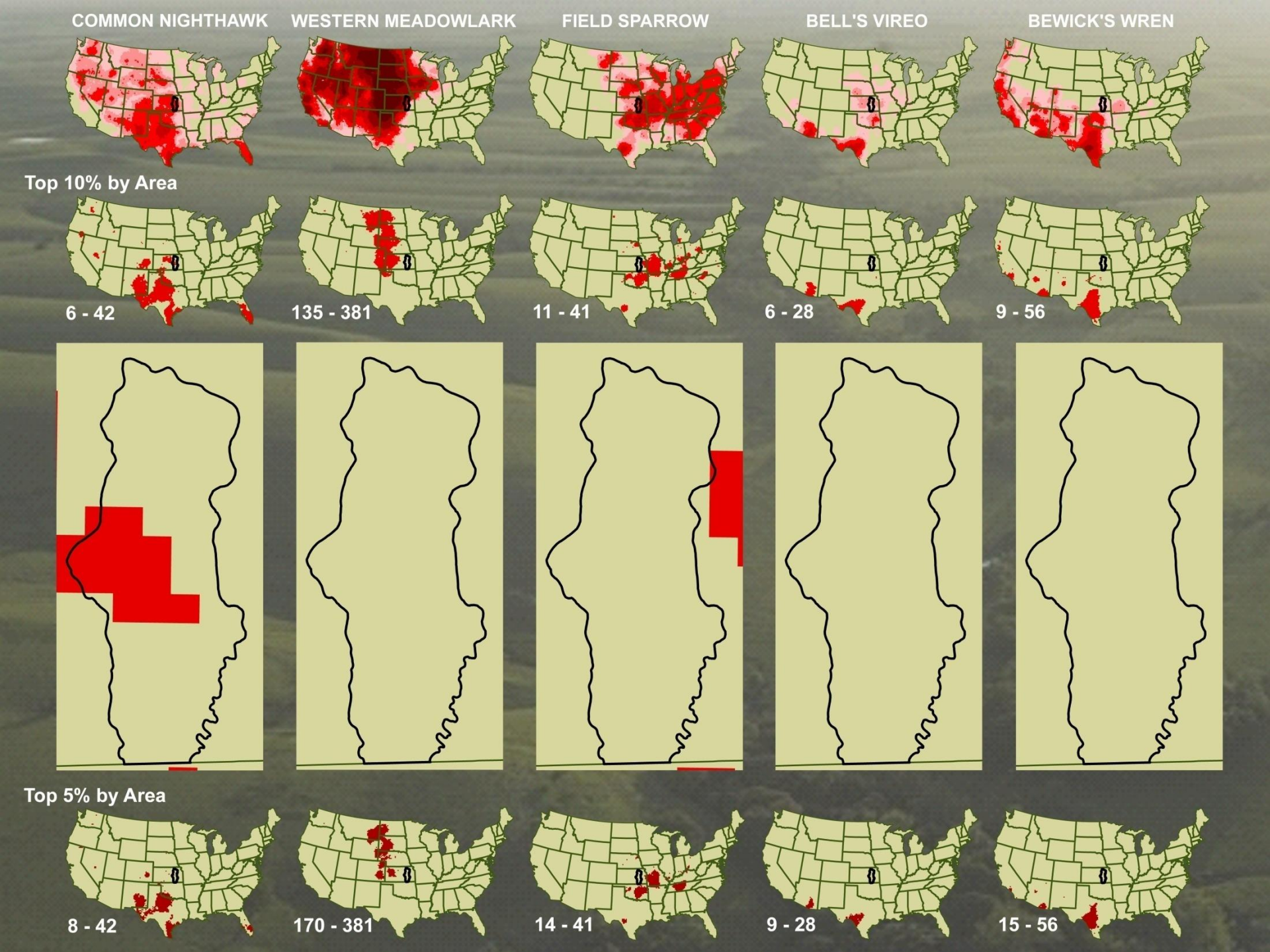


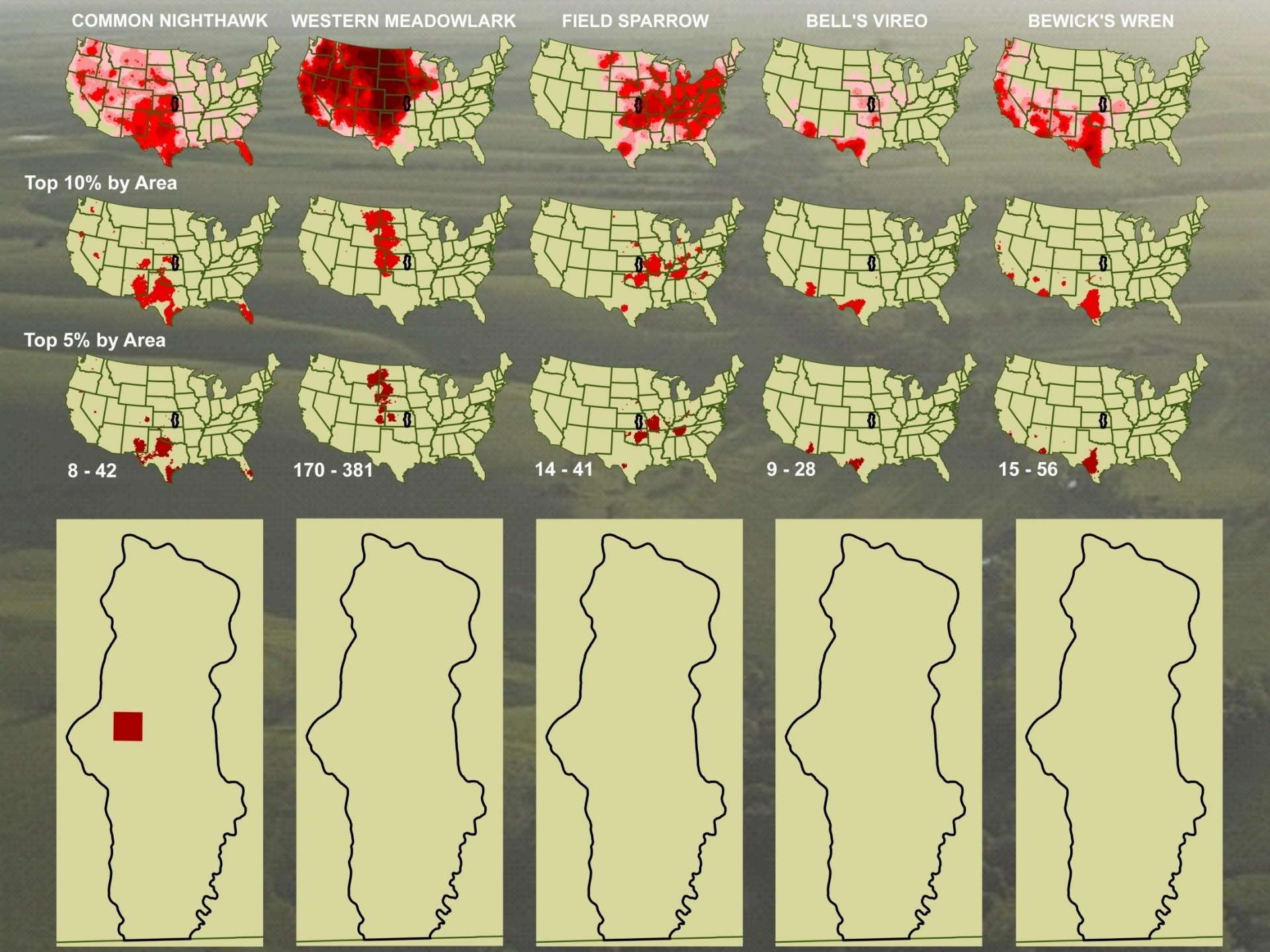


BEWICK'S WREN






COMMON NIGHTHAWK
WESTERN MEADOWLARK
FIELD SPARROW
BELL'S VIREO
BEWICK'S WREN
Top 10% by Area
6 - 42
135 - 381
11 - 41
6 - 28
9 - 56
Top 5% by Area
8 - 42
170 - 381
14 - 41
9 - 28
15 - 56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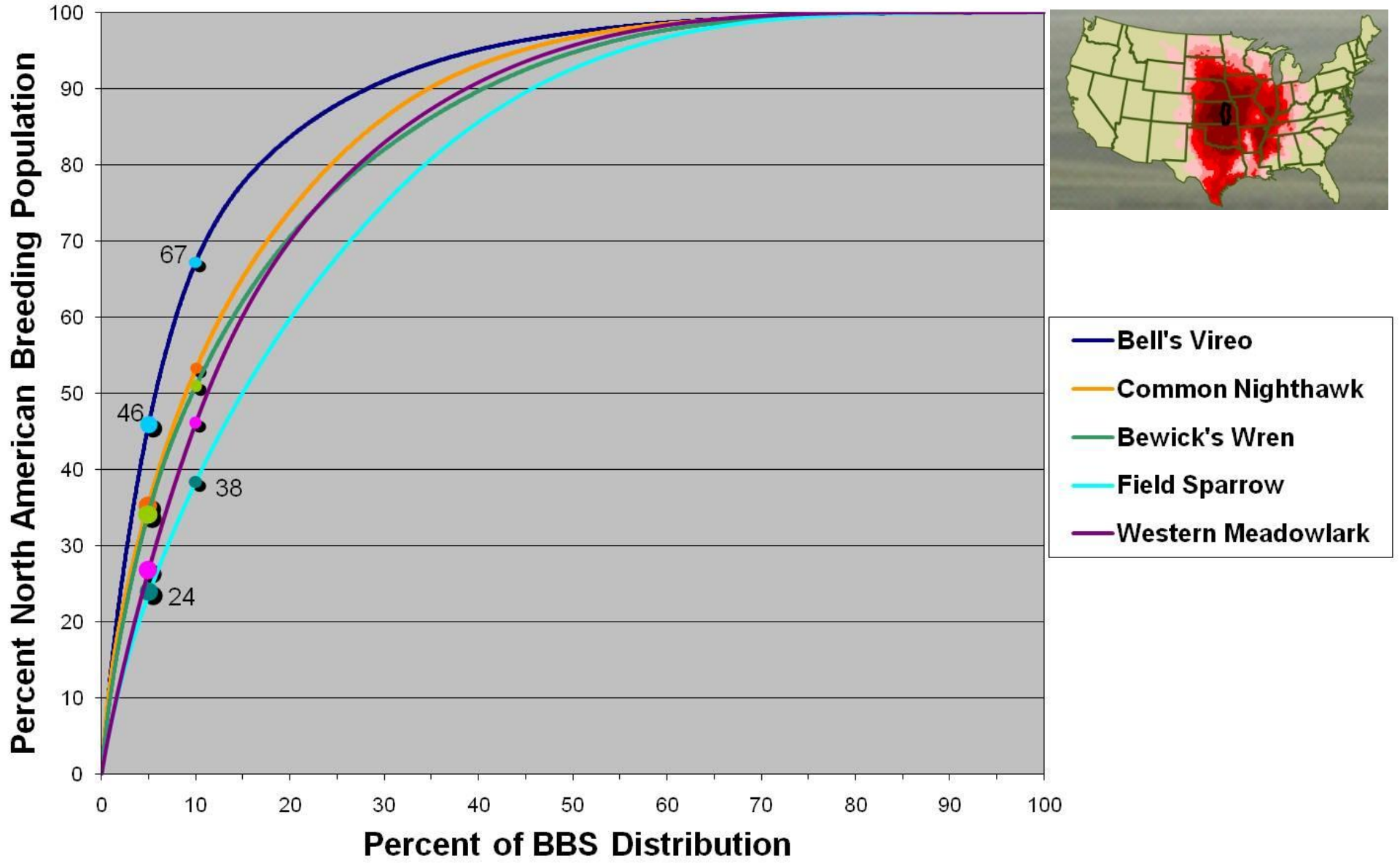
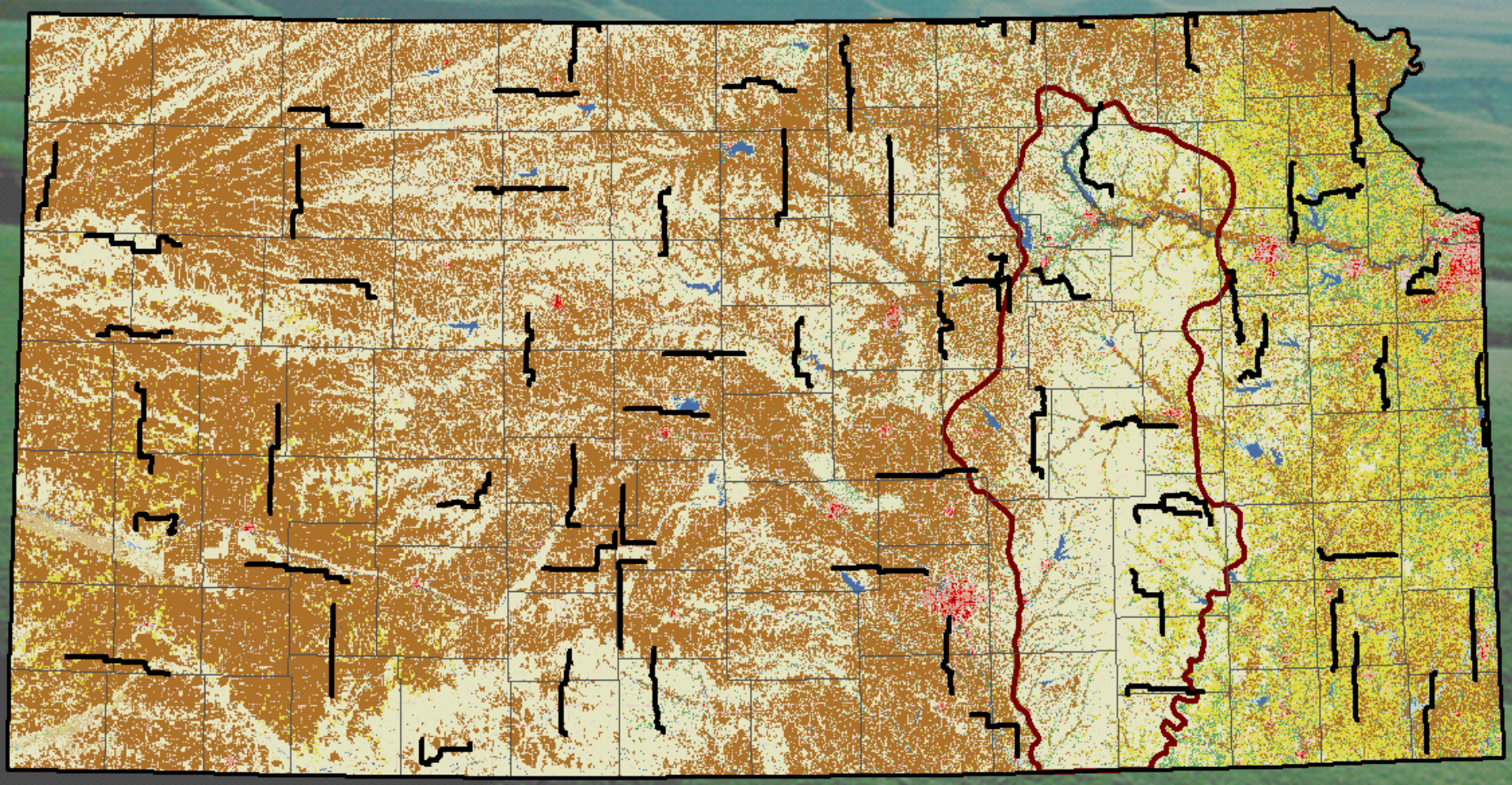
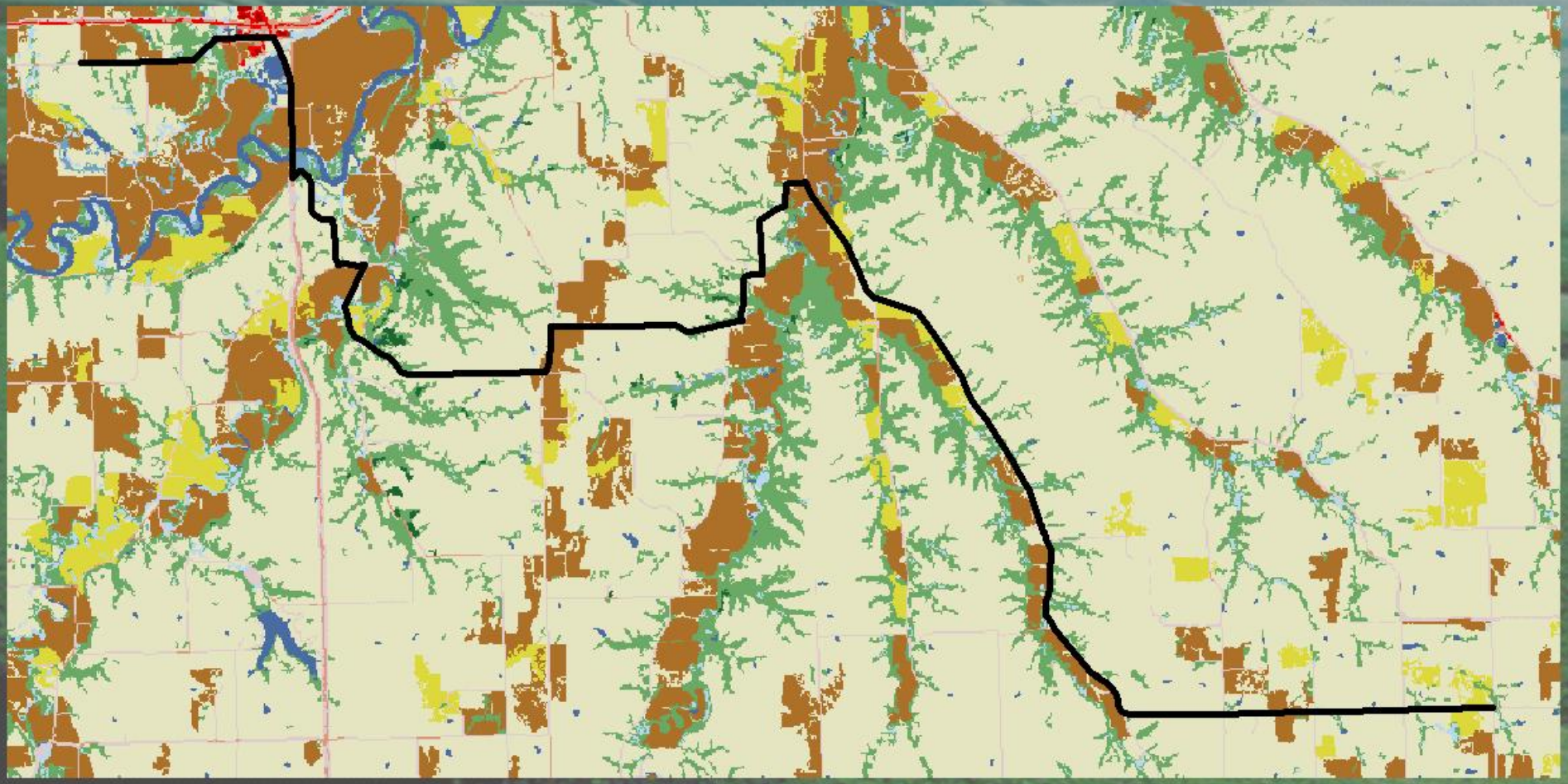

Percent North American Breeding Population
Percent of BBS Distribution
0
10
20
30
40
50
60
70
80
90
100
67
46
38
24
Bell's Vireo
Common Nighthawk
Bewick's Wren
Field Sparrow
Western Meadowlark

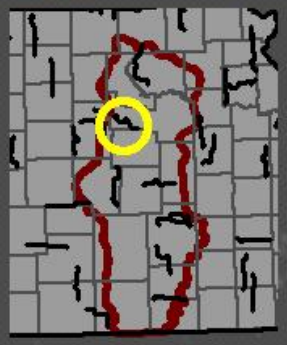
Breeding Bird Survey Routes: Kansas



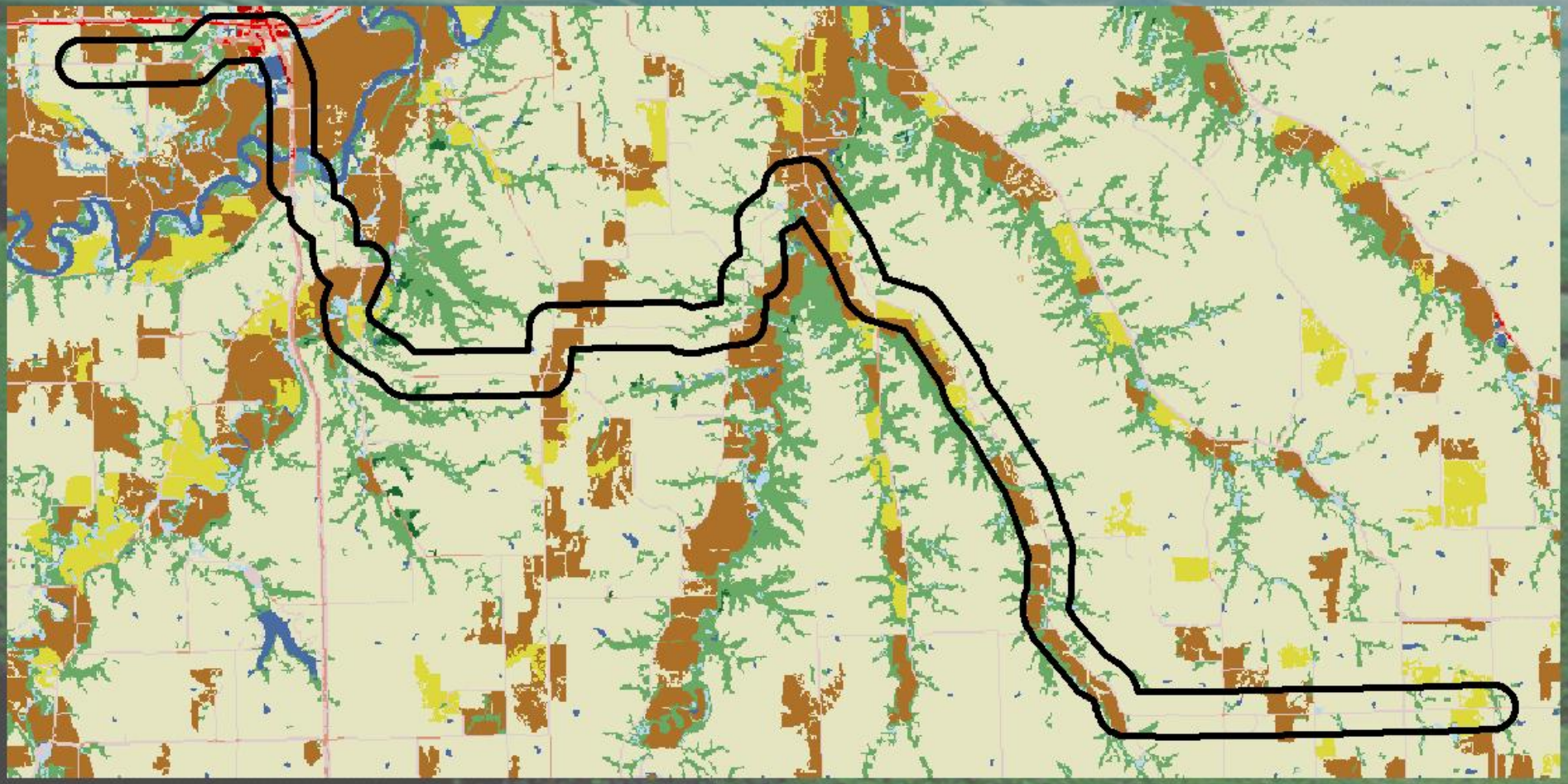
- Barren Land
- Cultivated Crops
- Deciduous Forest
- Developed, High Intensity
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, Open Space
- Emergent Herbaceuous Wetlands
- Evergreen Forest
- Grassland/Herbaceuous
- Hay/Pasture
- Mixed Forest
- Open Water
- Shrub/Scrub
- Woody Wetlands
- Flint Hills Ecoregion

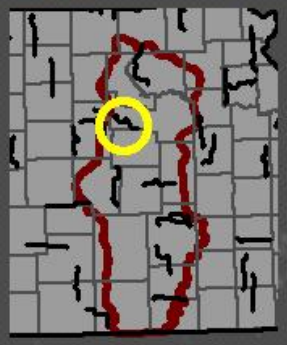
BBS Stop Level Analyses



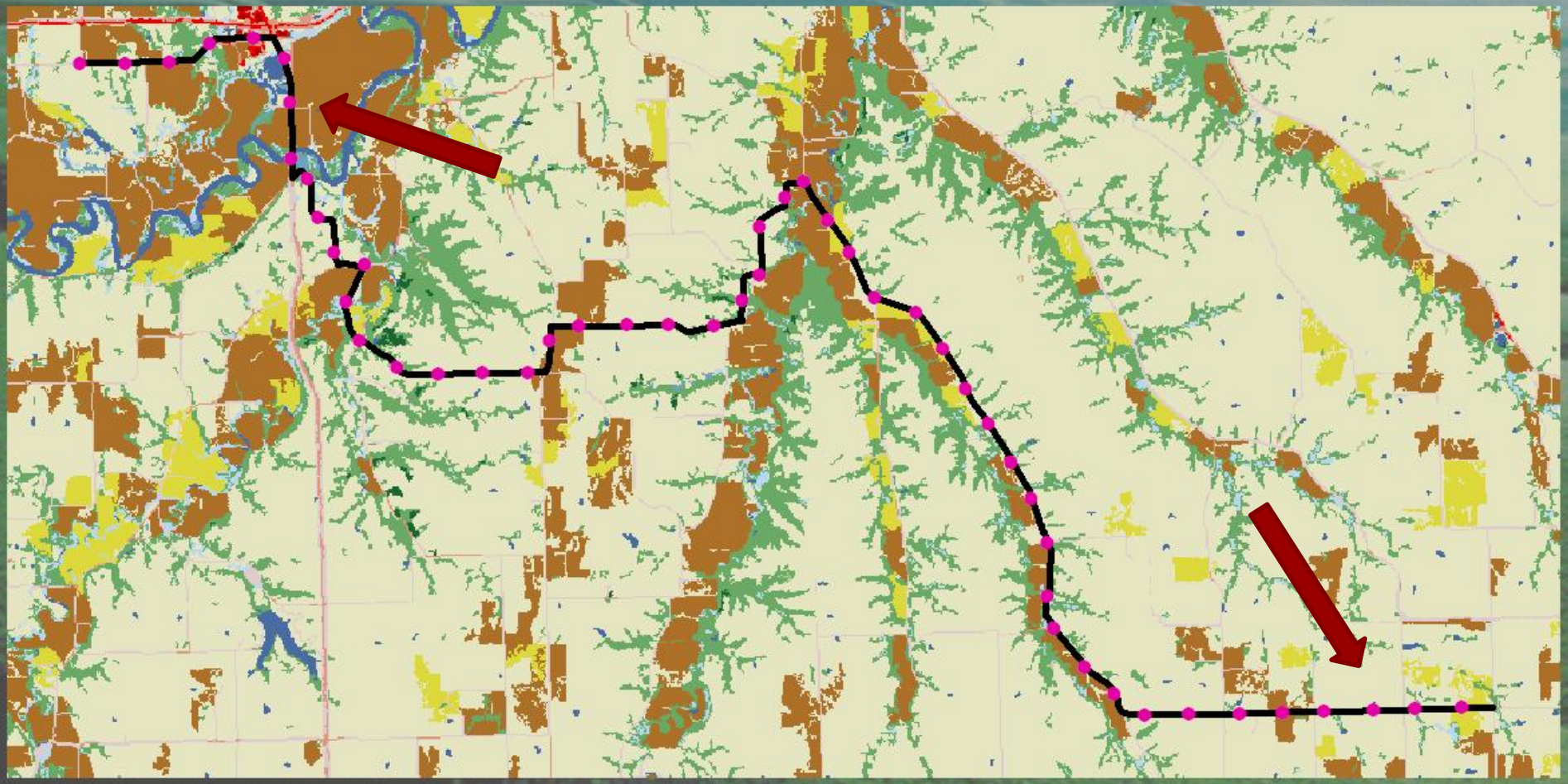


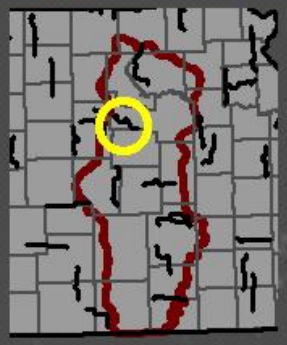
BBS Stop Level Analyses



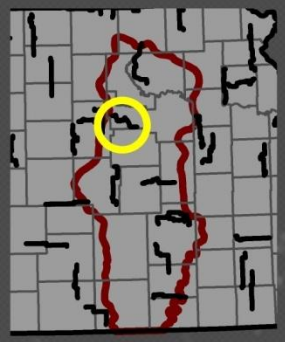


BBS Stop Level Analyses





BBS Stop Level Analyses



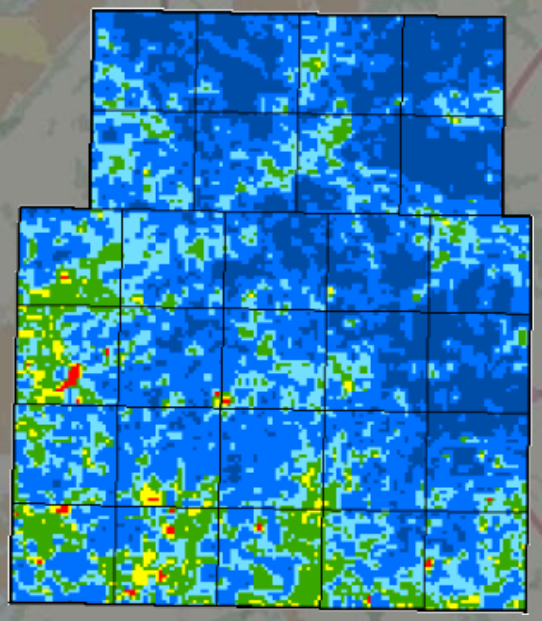
Evaluate Landscape Composition at multiple scales (meters):

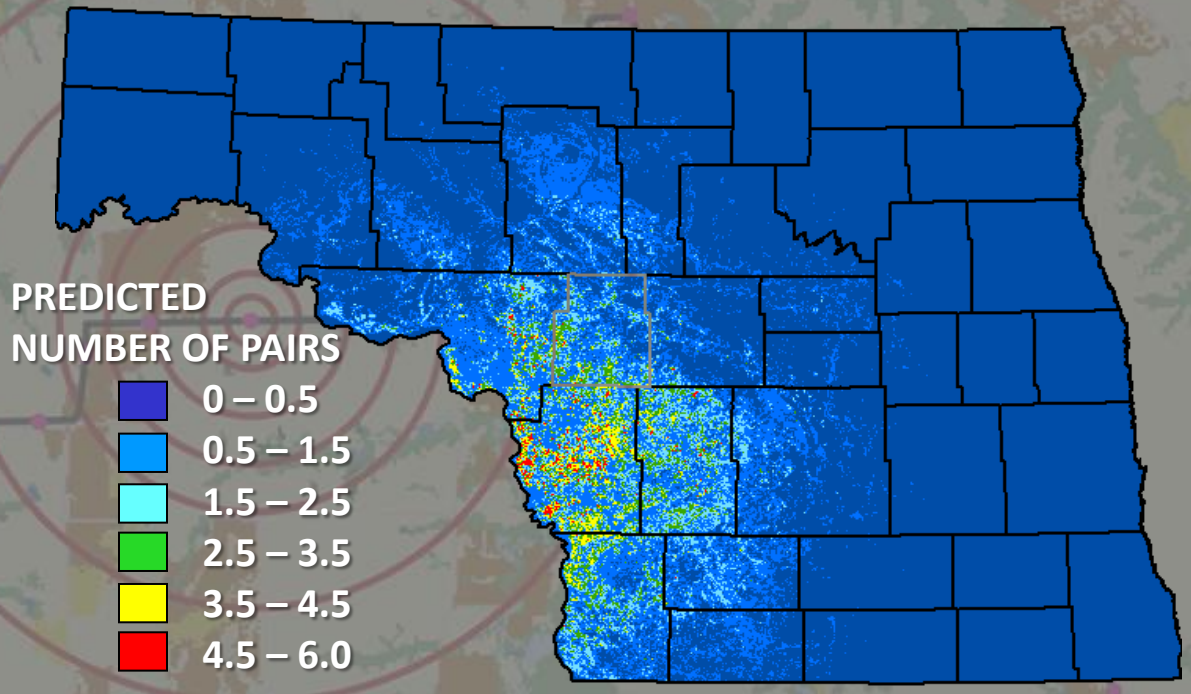
200
400
800
1200
1600
2400
3200

Habitat Variables

Measure of Fragmentation (number of patches)

Trend Surface (x, y location)





ND Grasshopper Sparrow:

-4052.9(805.2)+0.00084(0.007)CROPLAND+0.039(0.008)UND GRASS+3.0E-4(1.8E-4)EAST-1.88E-11(1.4E-12)EAST^2-5.4E-11(3.3E-12)EAST*NORTH+0.015(0.007)GRASSLAND+1.515E NORTH(2.9E-4)-1.417E-10(2.7E-12)NORTH^2-0.044(0.02)PATCHES

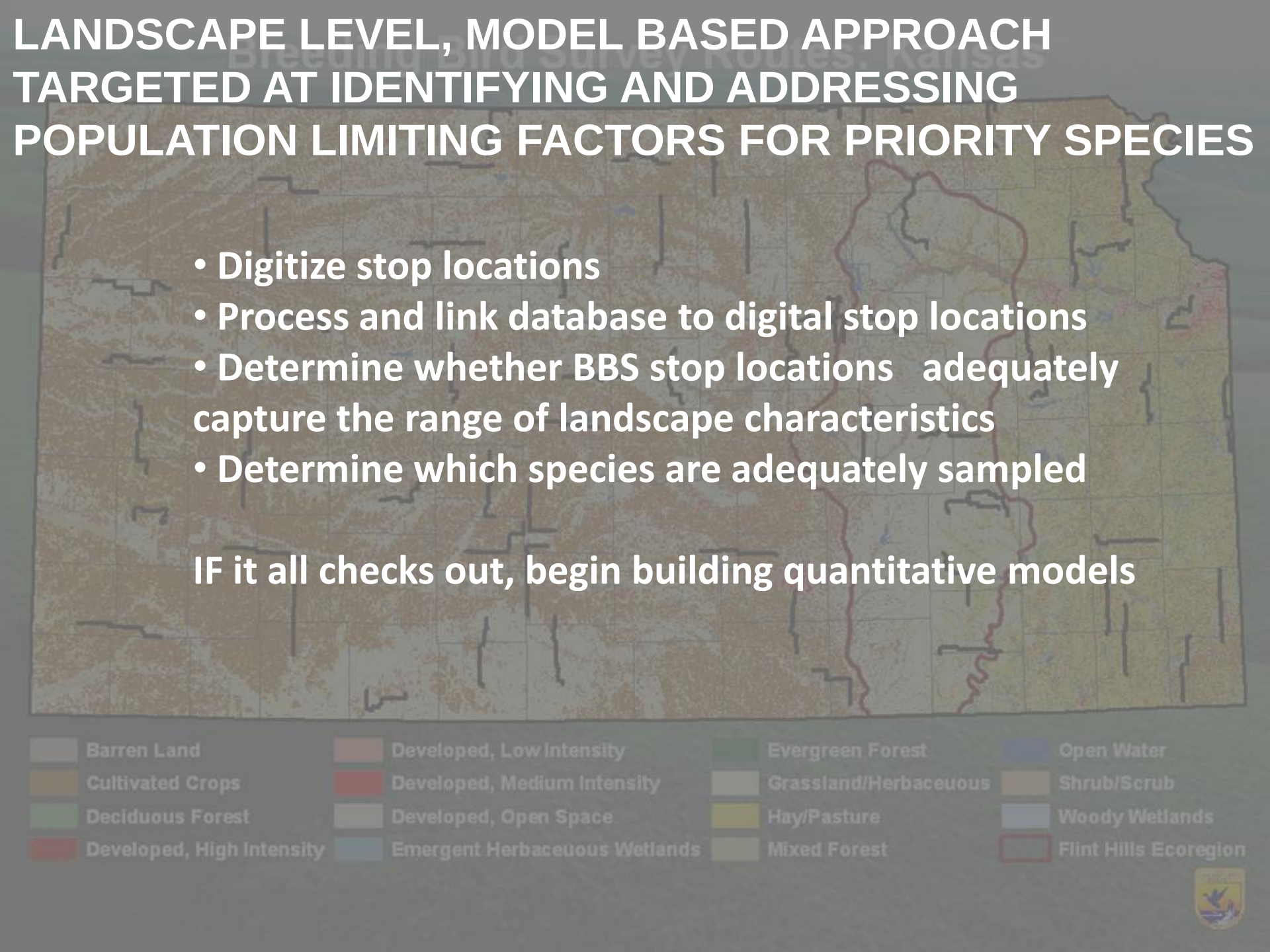
OTHER VARIABLES FOR MODEL DEVELOPMENT:

- Fire Regime
- Wetlands (NWI)
- Precipitation (PRISM)
- Digital Elevation Model (elevation, slope, etc)

LANDSCAPE LEVEL, MODEL BASED APPROACH TARGETED AT IDENTIFYING AND ADDRESSING POPULATION LIMITING FACTORS FOR PRIORITY SPECIES

- Digitize stop locations
- Process and link database to digital stop locations
- Determine whether BBS stop locations adequately capture the range of landscape characteristics
- Determine which species are adequately sampled

IF it all checks out, begin building quantitative models



ENDANGERED SPECIES

Endangered Species (breeding)

Endangered Species (wintering)

Endangered Species (migration)

PRIORITY = YES

Question: Will the treatment (protection of grassland habitat) address limiting factors?

ENDANGERED SPECIES

Have We Identified
Population Objectives?
Limiting Factors?
Critical Habitats?

Do We Have Models Linking Population Response to Habitat?

FEDERAL TRUST SPECIES

OTHER SPECIES

GREATER PRAIRIE-CHICKEN: PRIORITY SPECIES FOR FHLCA

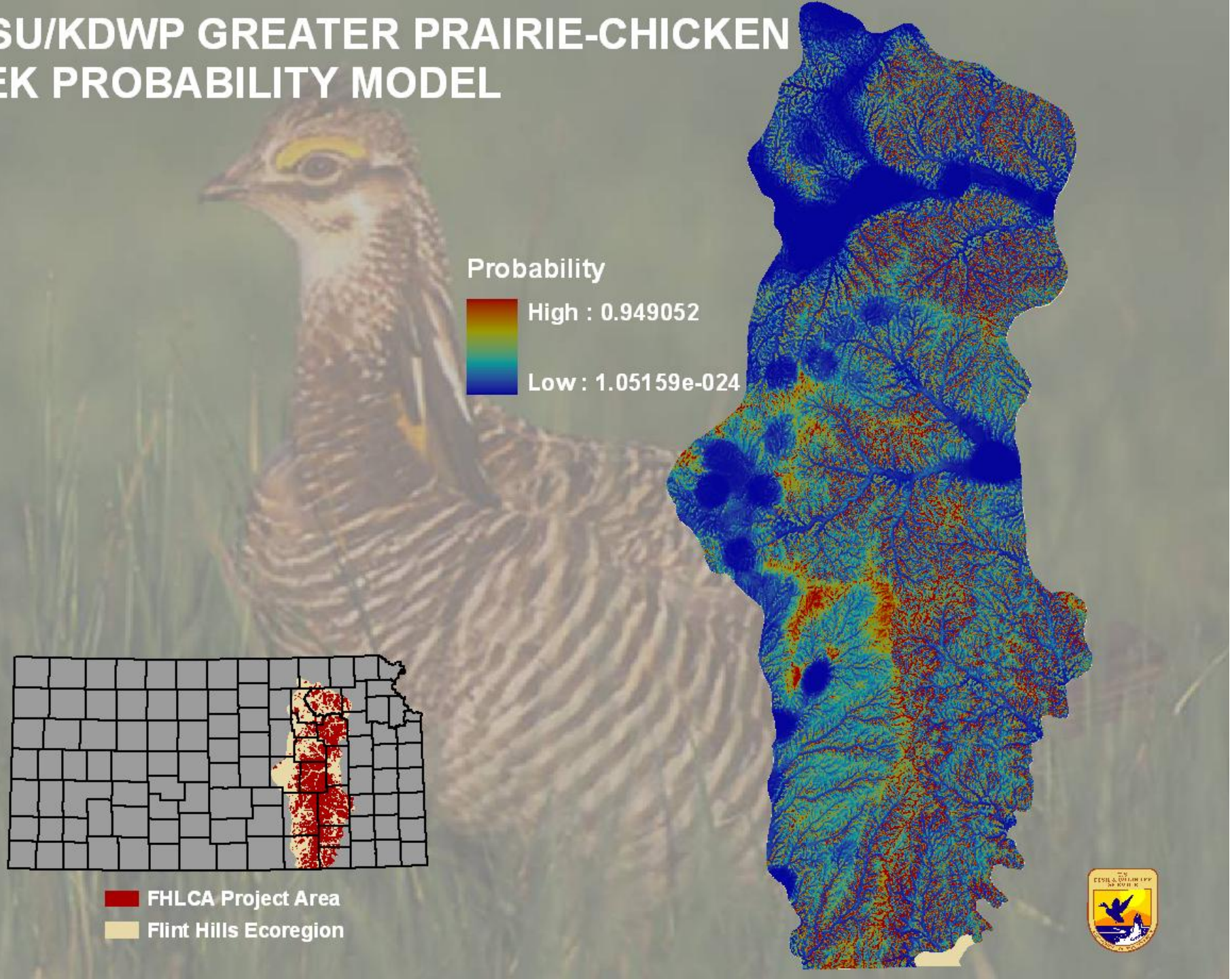
Pros:

- Socially desirable – "charismatic megafauna"
- Sensitive to landscape characteristics (habitat loss, fragmentation, etc)
- Resident Species (may represent migration, breeding, and wintering needs of other species)

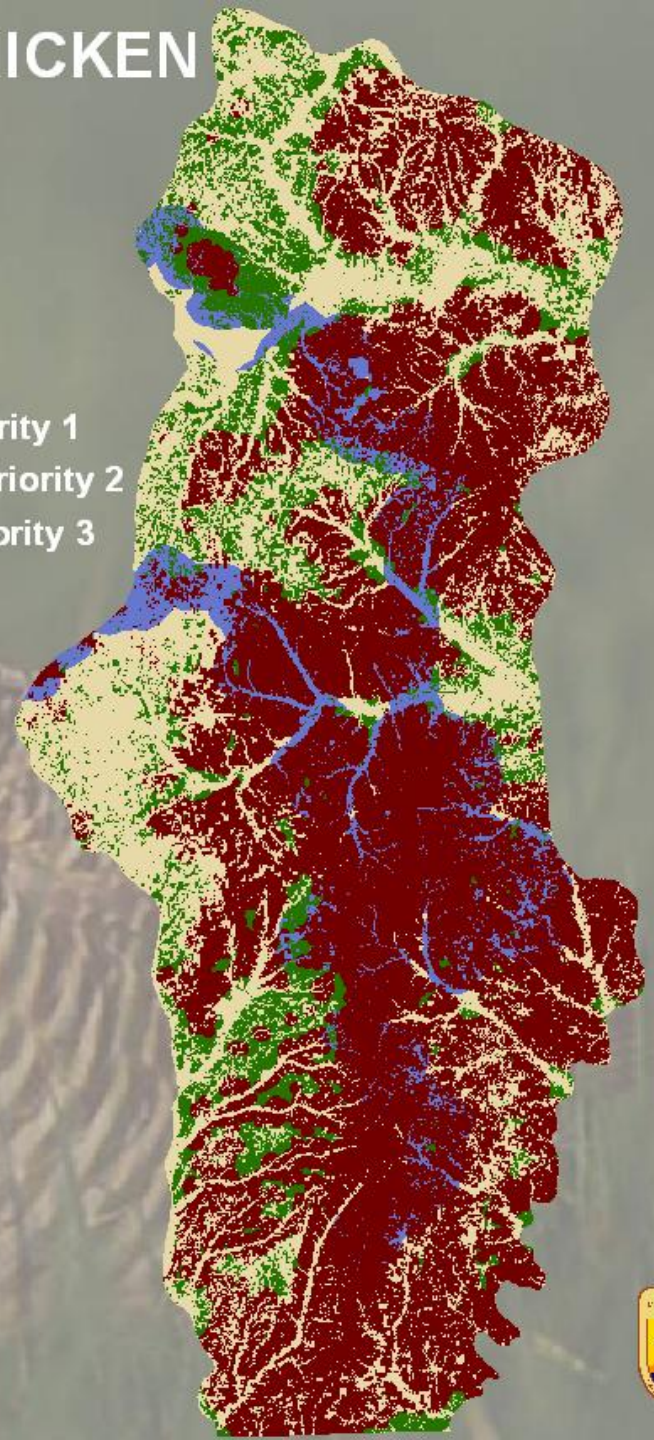
Cons:

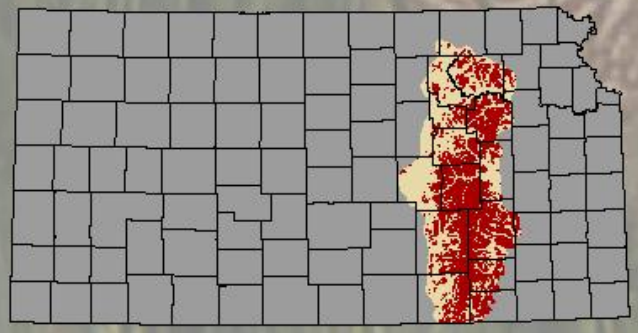
- Not a federal trust species
- Population limiting factors may not be limiting other species (resident gallinaceous vs fish or migratory passerines)
- Unknown whether habitat goals will meet the needs for other species in the guild
- Time and money spent developing information for greater prairie-chickens will not be spent on other species

KSU/KDWP GREATER PRAIRIE-CHICKEN LEK PROBABILITY MODEL

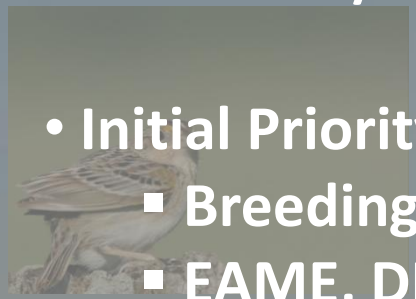


KSU/KDWP GREATER PRAIRIE-CHICKEN LEK PROBABILITY MODEL





CONCURRENCE/SUPPORT/GUIDANCE:



- Initial Priority Species
  - Breeding Grassland Dependent Migratory birds
  - EAME, DICK, GRSP, HESP, UPSA

- Continue to Work with Ecological Services to Develop Endangered Species Information
  - They are all priority species
  - Will incorporate as appropriate

- KDWP will be the lead for Greater Prairie-Chicken, we will collaborate

- Broader Scale Population Goals are Beyond the Scope of this Project
  - Can and will be incorporated when developed

Hierarchical Prioritization Structure

Federal Trust Species } Purpose / Goal

Threats

Program Efficiency and Support

} Directly Affects Ability to Achieve Goals

Non-Federal Trust Species *

Management Practices

Current Condition

} Indirect, Short Term &/or Side Benefits

QUESTIONS/COMMENTS/DISCUSSION