An overview of GIS planning, monitoring, and evaluation tools

CEAP Wetlands
High Plains Assessment

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Outline

- **Introduction**
- Hierarchical All Bird Strategy (HABS)
- Develop Baseline Data
- GIS Modeling
- GIS/HABS Integration
- Program Decision Support Tools
- Program Evaluation

Effective and Efficient GIS Collaboration

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Tallgrass Prairie
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GIS Technician
Great Plains
GIS Partnership

Rainwater Basin Joint Venture

Central Platte Natural Resources
District

Playa Lakes Joint Venture

Introductions

- **Great Plains GIS Partnership**
  - **Working Group of PLJV, RWBJV, and USFWS employees dedicated to development, evaluation, and analysis of GIS data.**
    - **Goals:**
      - **Create, modify, and evaluate data for natural resource planning, and conservation program delivery.**
      - **Implement biologically driven spatially explicit models that can be used to shift the existing conservation paradigm from random to directed delivery.**
      - **Develop models that will facilitate adaptive resource management resulting in continued refinement of G^2P^2 products and conservation delivery.**

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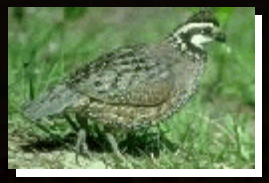
North American Bird Conservation Initiative

North American Waterfowl Management Plan

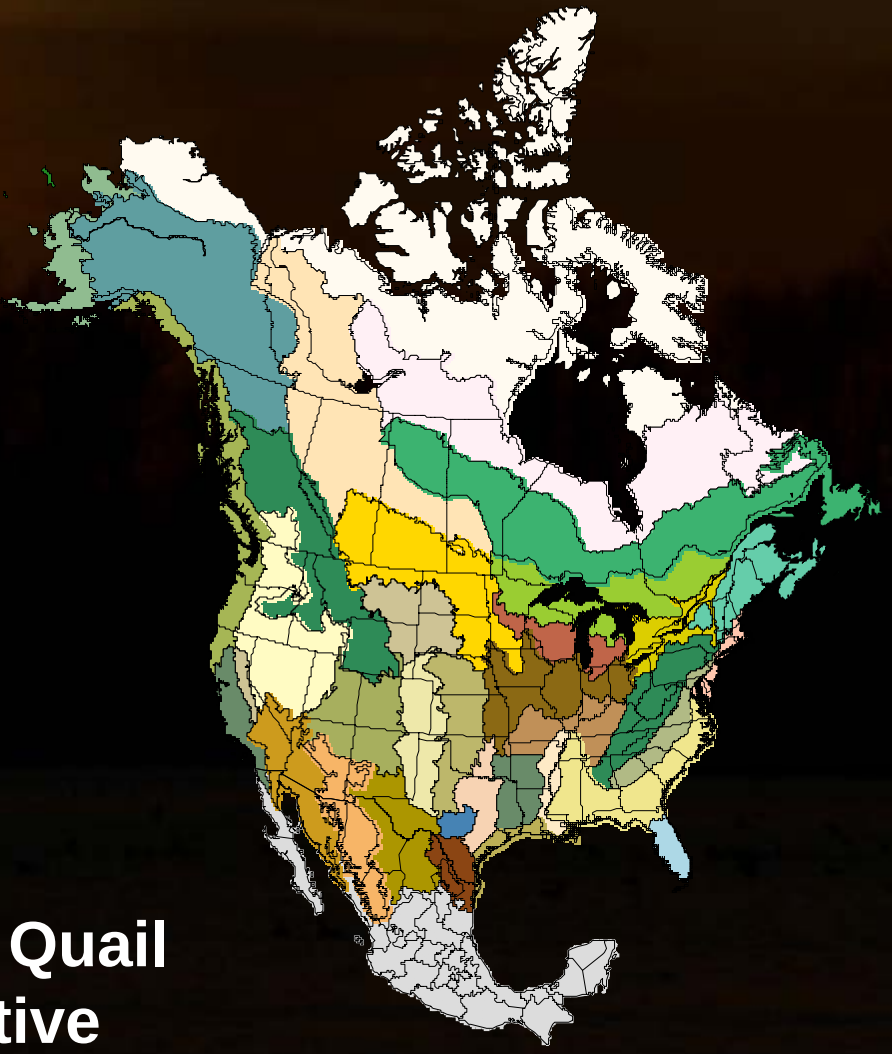
North American Waterbird Plan

U.S. Shorebird Conservation Plan

Partners in Flight



Northern Bobwhite Quail Conservation Initiative



How Do We Utilize the Population Estimates and Objectives Listed in the Continental Plan?

What does this mean to my BCR?
How do I derive habitat objectives?

Species[1]	US & Canada Population[4]	Population Objective
Canada Warbler	1,400,000	Increase 50%
Brewer's Sparrow	16,000,000	Increase 100%
Baird's Sparrow	1,200,000	Increase 100%
Harris's Sparrow	3,700,000	Increase 100%
Varied Bunting	31,000	Increase 50%
Painted Bunting	3,600,000	Increase 100%
Dickcissel	22,000,000	Increase 50%
Rusty Blackbird	2,000,000	Increase 100%

A Simple Model

Groups/Taxa		Habitats (assoc.)		Conditions		Amount
Pheasants	→	CRP	→	Lots	→	More pheasants
Ducks		Playas		Wet		More Ducks
Songbirds		All		Yes		More songbirds

All bird ain't simple!

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Pheasants	CRP	Lots	More pheasants
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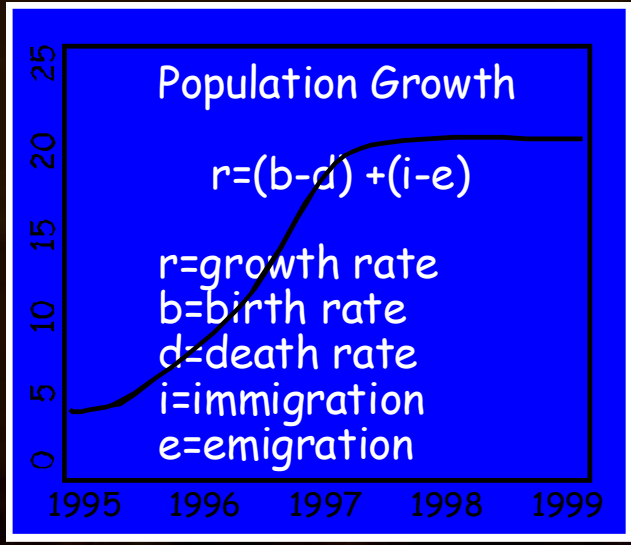
Groups/Taxa	Habitats (assoc.)	Conditions	Amount
Dabblers	Playas	grazed	Acres via density
Cranes	Mid-grass	moist-soil	Use-days via energetics
Bl-cr Night-Heron	Riparian	wet	Occurrences
Mountain Plover	Shortgrass	fragmented	
Long-billed Curlew	Sand Sage	pitted	
Lark Bunting	etc.	fenced	
etc.			

How do we determine how many acres are needed when everything is different and changing but interrelated?

Conceptual Models

Conceptual models are descriptive statements about how a system Functions based on best available science.



Establish Assumptions

Predict Results

Compare Alternatives

Implement Actions

Acres of Habitat in an Area

X

Density of a Species in an Area

=

Carrying Capacity of an Area

Then, compare carrying capacity to goal

If needed, develop habitat to meet goal

All bird ain't simple!

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How do we determine how many acres are needed when everything is different and changing but interrelated?

Microsoft Access - [I-Plan Areas]

File Edit View Insert Format Records Tools Window Help

Area: BCR 18 - NE Area Acres: 8,719,750

I-Plan Associations

Assoc Name: CRP (small block) PRGM 1: CP-23a PRGM 1 Acres: 14,000 OPT 1: OPT 1 Acres: 0

Assoc. Acre Update By: PRGM 2: PRGM 2 Acres: 0 OPT 2: OPT 2 Acres: 0

PRGM 3: PRGM 3 Acres: 0 OPT 3: OPT 3 Acres: 0

Assoc Acres: 328,000 Post PRGM AA: 342,000 Post Opt AA: 342,000

Assoc. Model: FSA CLO layer where available

I-Plan Conditions, species and seasons

Condition Name: Native % of Assoc: 0.100 Update by CMR

Condition Ref

I-Plan Species

AOU7_44	Species Name	Area Ref	Habitat Ref	Comments
94	Ring-necked Pheasant	Mollhoff 2001	Sharpe et al.	
1874	Dickcissel	Mollhoff 2001	Sharpe et al.	
119	Northern Bobwhite	Mollhoff 2001	Delisle and S	
1814	Lark Bunting	Mollhoff 2001	Sharpe et al.	Density does not appear to differ between native
1816	Grasshopper Sparrow	Mollhoff 2001	Johnson et al	Density does not appear to differ between native
1875	Bobolink	Mollhoff 2001	Johnson et al	Density does not appear to differ between native
1839	Chestnut-collared Longspur	Mollhoff 2001	Johnson et al	Density does not appear to differ between native

Record: 1 of 7

I-Plan Season

Season: Resident % Available: 1.00 % Suitability: 1.00 Units: 0.0240

Period: Available Ref: Suitability Ref: Unit Ref: Delisle and Sa

CC Current: 787 CC Post PGRMS: 4,104 Unit Comment: Density is 4-year average from CRP sites in e. NE (Saunders & Lancaster counties)

% of Goal: 0.40% Post PRGMS %: 0

Goal: 193,755

Record: 1 of 1

Record: 1 of 2

Record: 4 of 17

Record: 3 of 12

Form View NUM

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- Introductions
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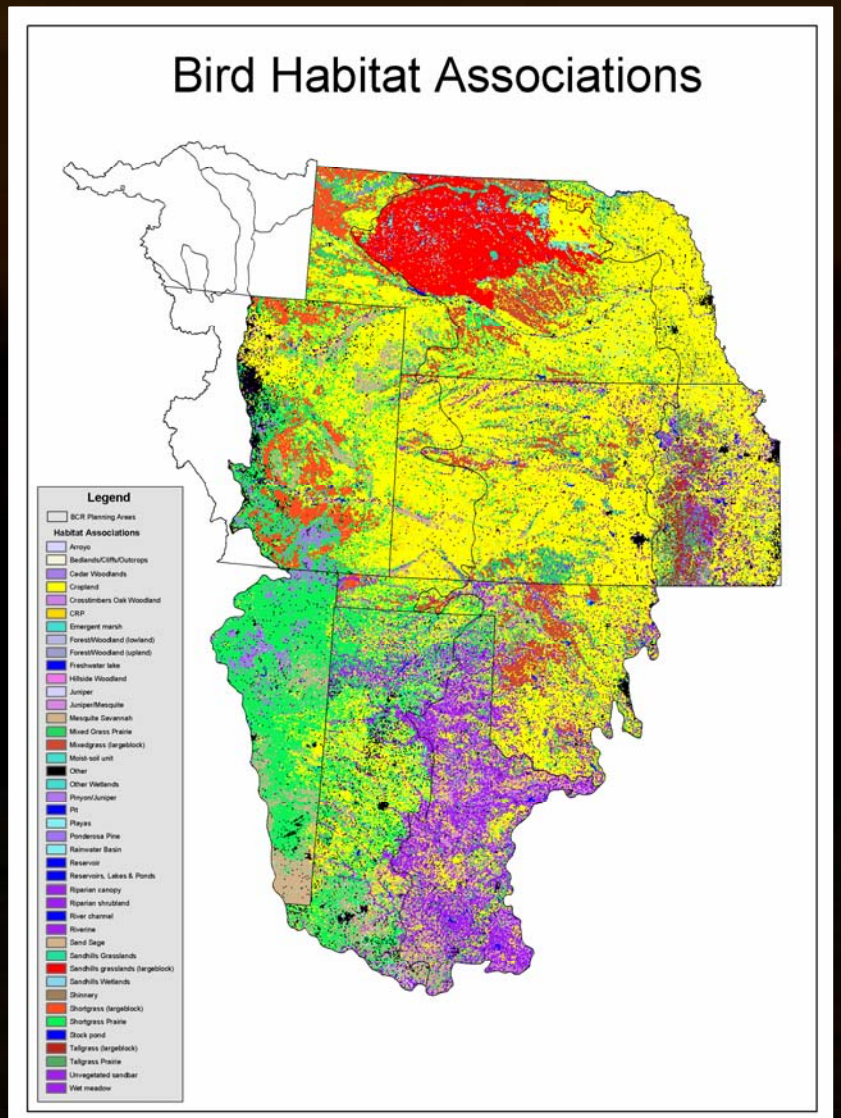
GIS Process:

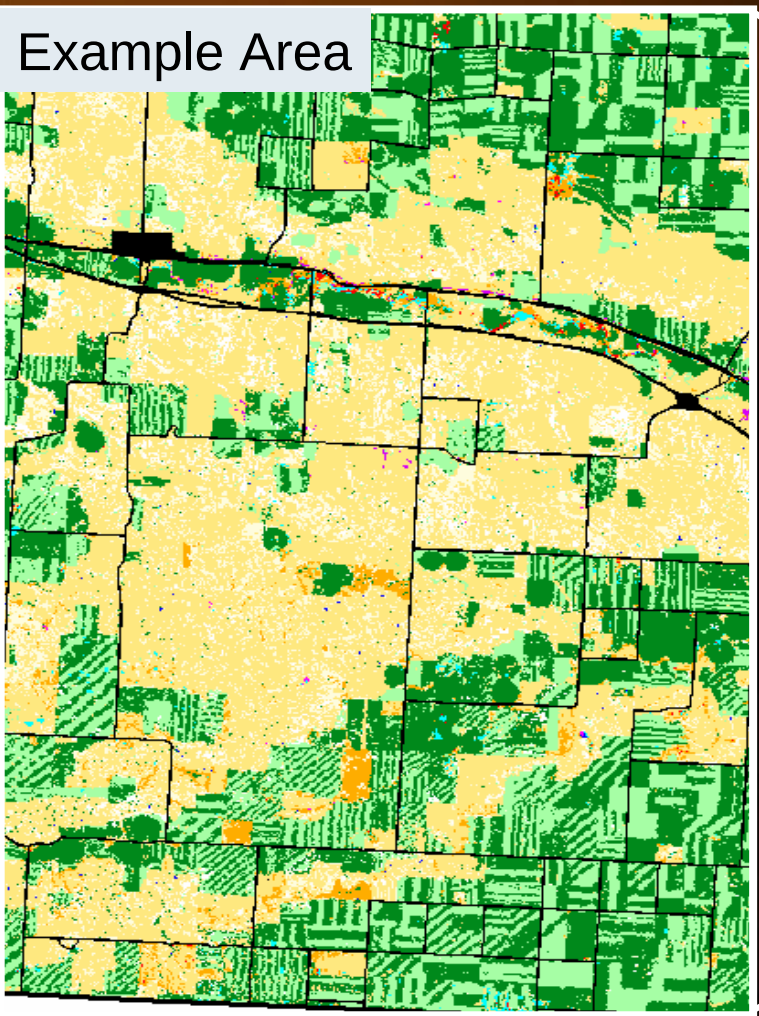
Develop Landcover Consistent with Bird Habitats

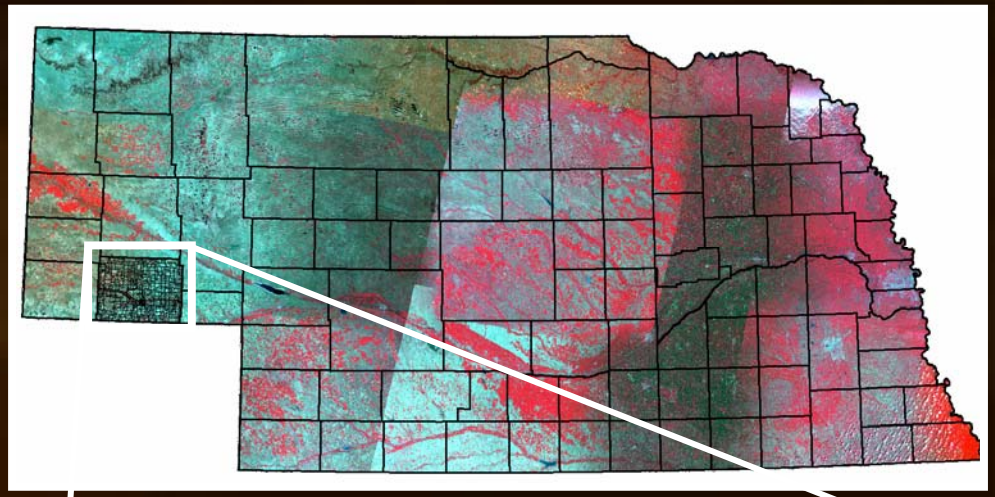
- Integrate multiple datasets
  - remotely sensed
    - TNC
    - GAP
    - Fire assessment
    - Habitat assessments
  - Ancillary datasets
    - Soils
    - NWI
    - CLU
    - CRP
    - CREP
    - WRP

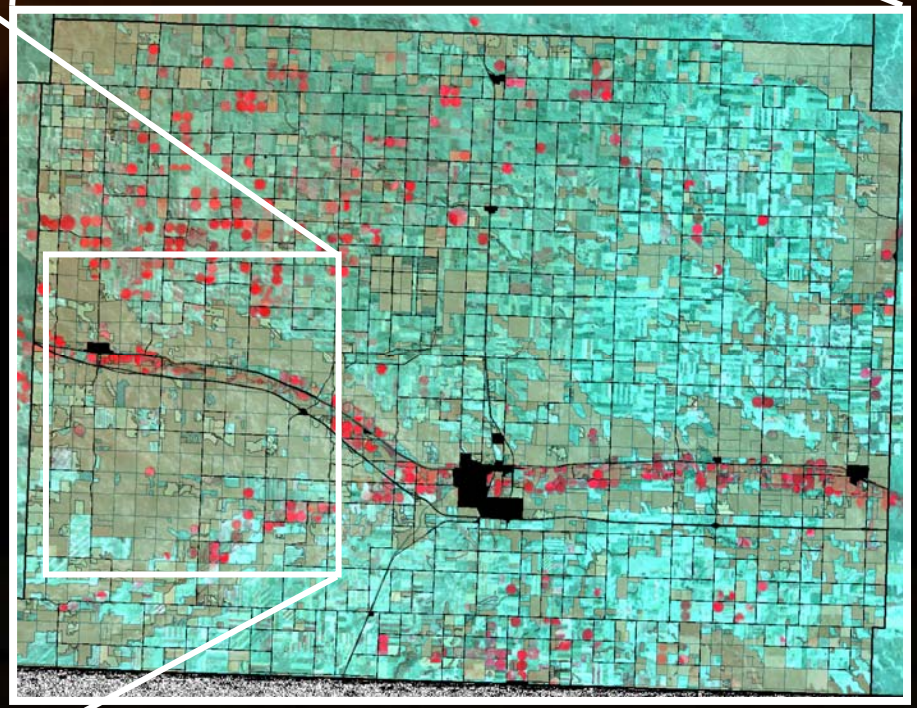


BCR 18

Grassland Habitat Characterization







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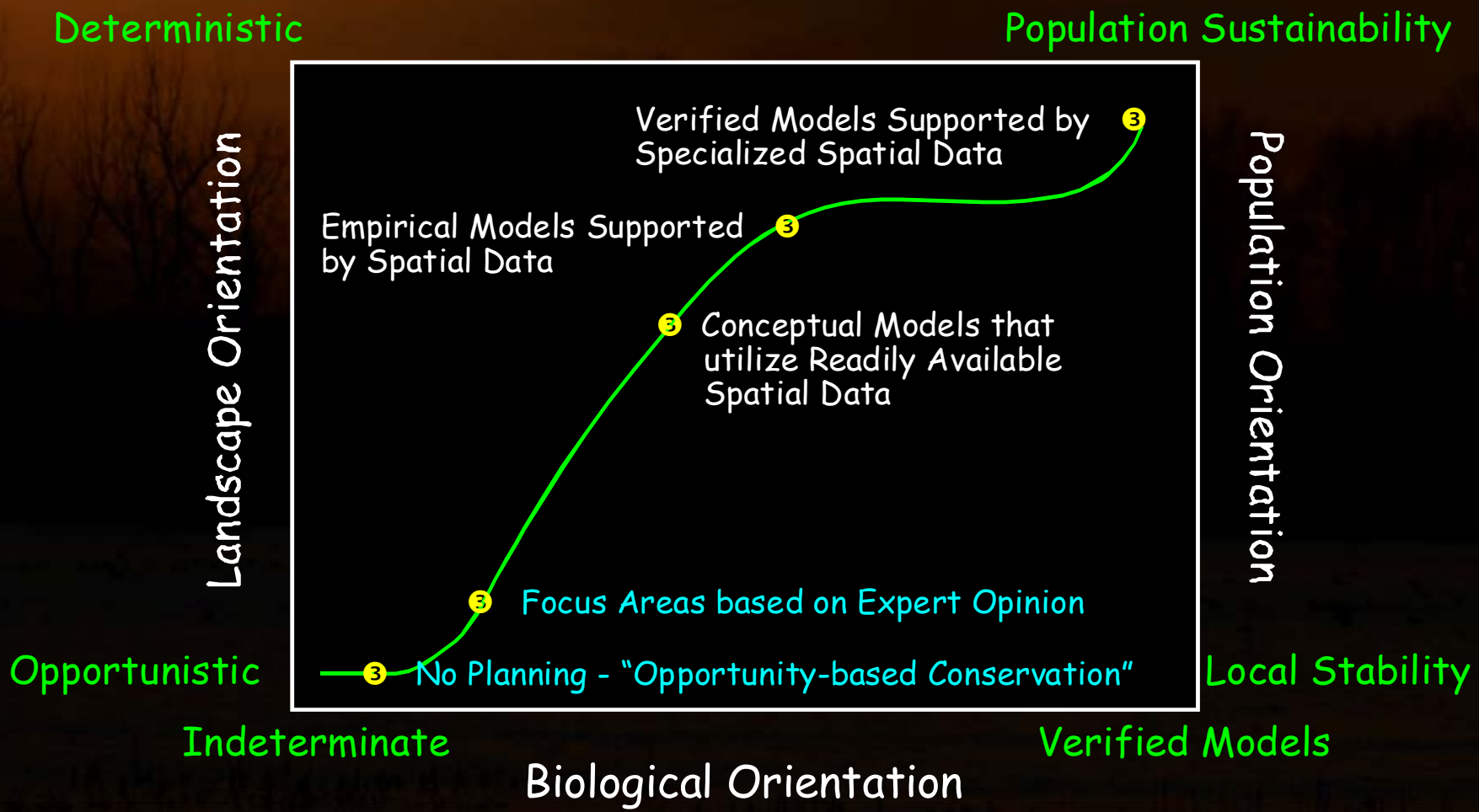
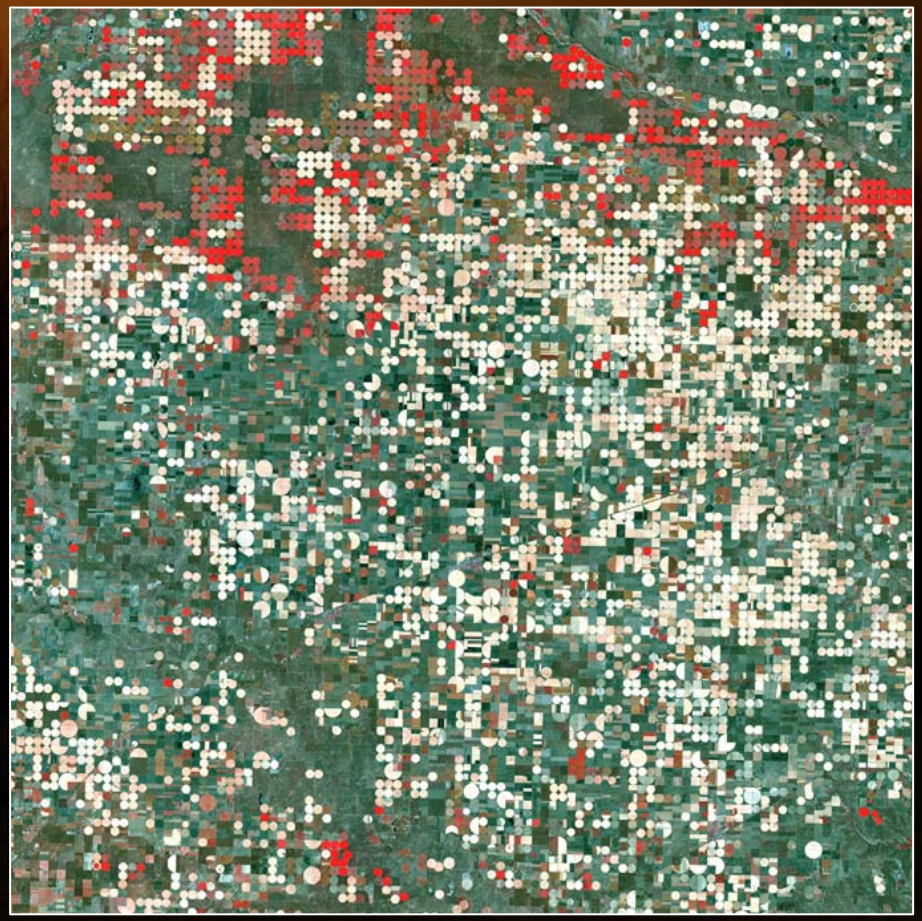
Opportunistic ➔ Strategic

Regionally-based…
Biologically-driven…
Landscape-oriented partnerships…



Modeling Foundation

Limiting Factors
Fragmentation/Land Conversion



Species Requirements
Area Sensitivity/Suitable Habitat

Biological Model

Assumptions

- Preferential for large blocks
- All grassland types are non-hostile
- Recognize carrying capacity of different grassland communities (CRP vs native prairie)
- Develop carrying capacity (bird densities) for all species of concern

Parameters

- 1250 acres of grass in a 1650 acre landscape
- Incorporate CRP, range, grass, playas and pasture to identify “grassland core”
- Less than 25 acres of roads in landscape
- Less than 25 acres of trees in landscape
- Utilize a database to link different habitats (GIS data) to carrying capacity (biological data, densities)
- Continuing inventories and monitoring to establish valid densities and enhanced GIS data

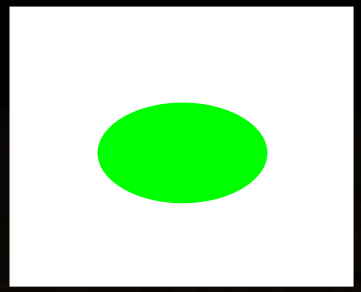
Habitat Requirements

Core Habitat

- Core area required by grassland birds
  - 1250 acres in 1650 acre landscape (2.5 square miles)

Contiguous as well as Noncontiguous Habitat:

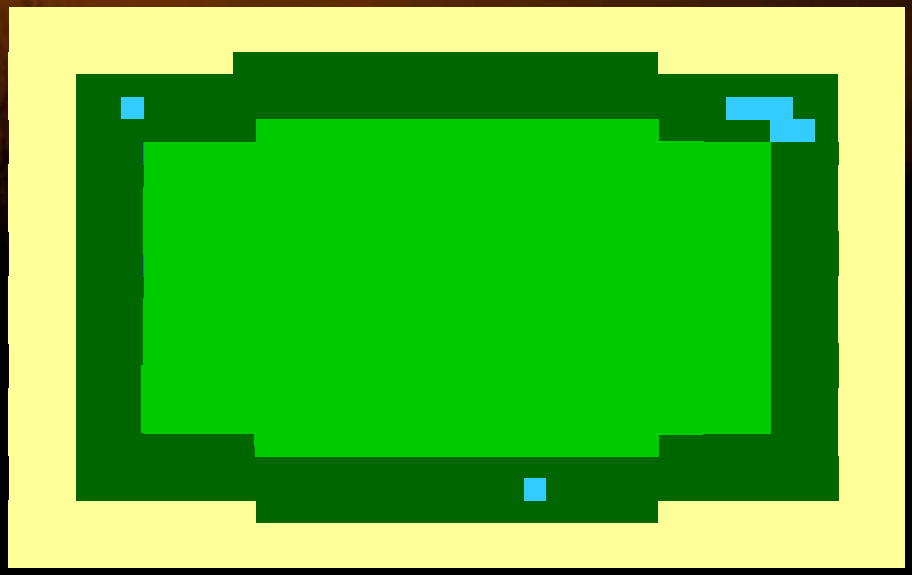
- Total grassland patch size



Habitat Requirements

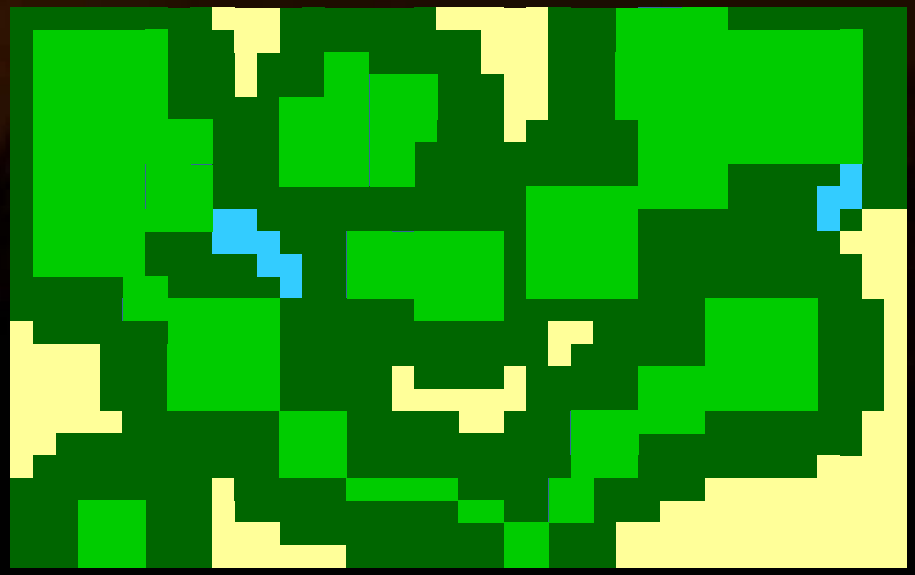
Example: ≥1250 acres within 1650 acre window

Contiguous Core Habitat



1650 acre landscape

Non-Contiguous Core Habitat



1650 acre landscape

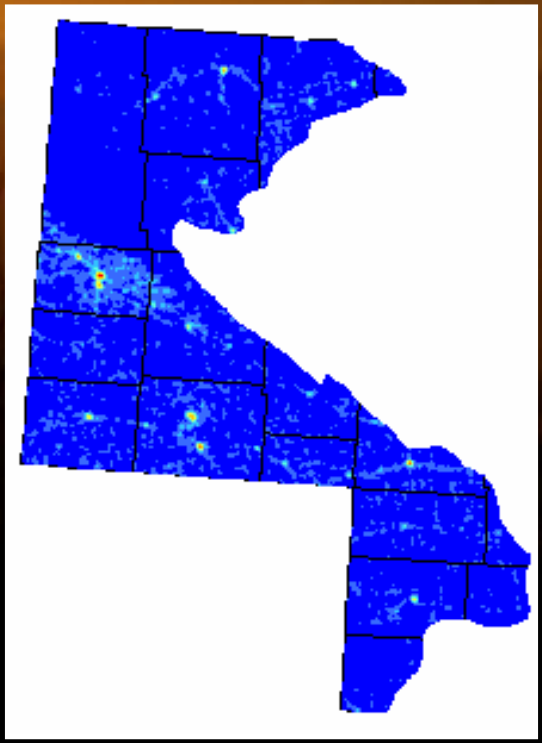
Grassland Habitat Core

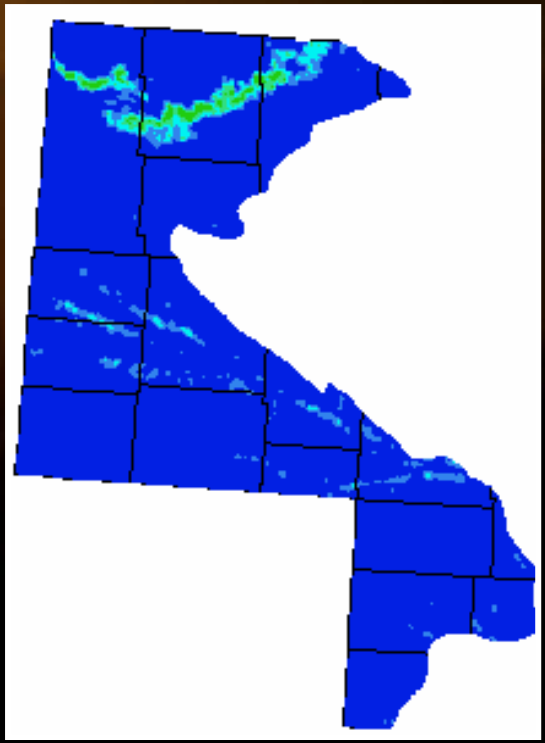
Non-hostile

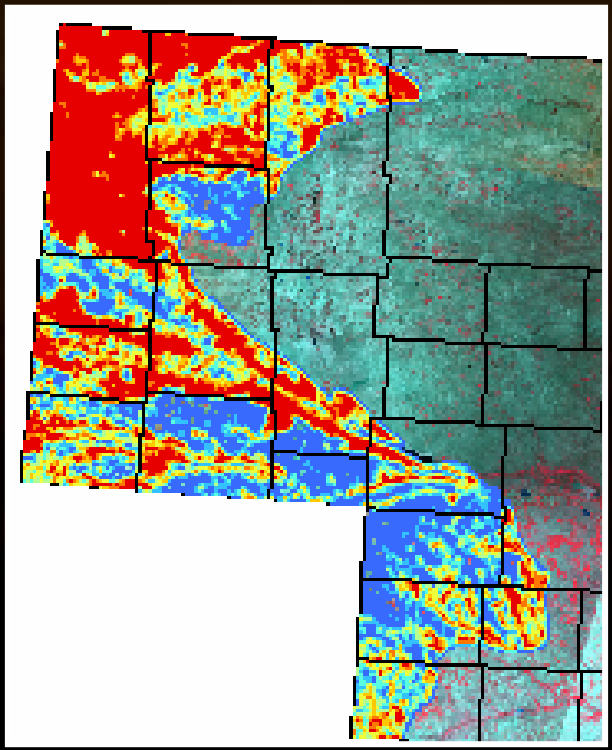
Hostile

GIS Process:

Extract acceptable habitat:







Percent Roads

- No 4 lane roads
- ≤250 ac acceptable

Trees

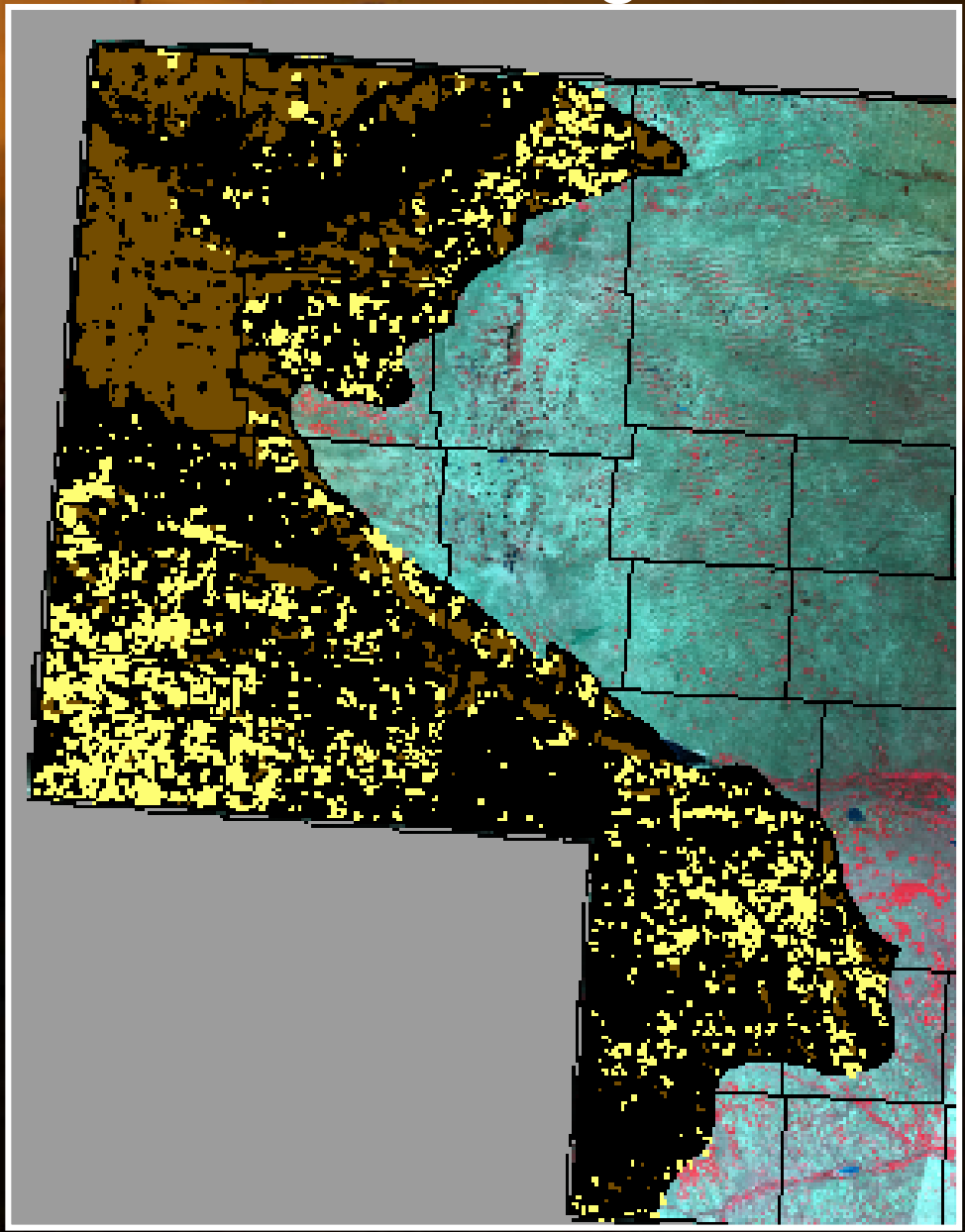
- ≤250 ac acceptable

Grass

- ≥ 1250 acres in 1650 acres Landscape

GIS Process:

All grassland habitat in BCR 18



All:

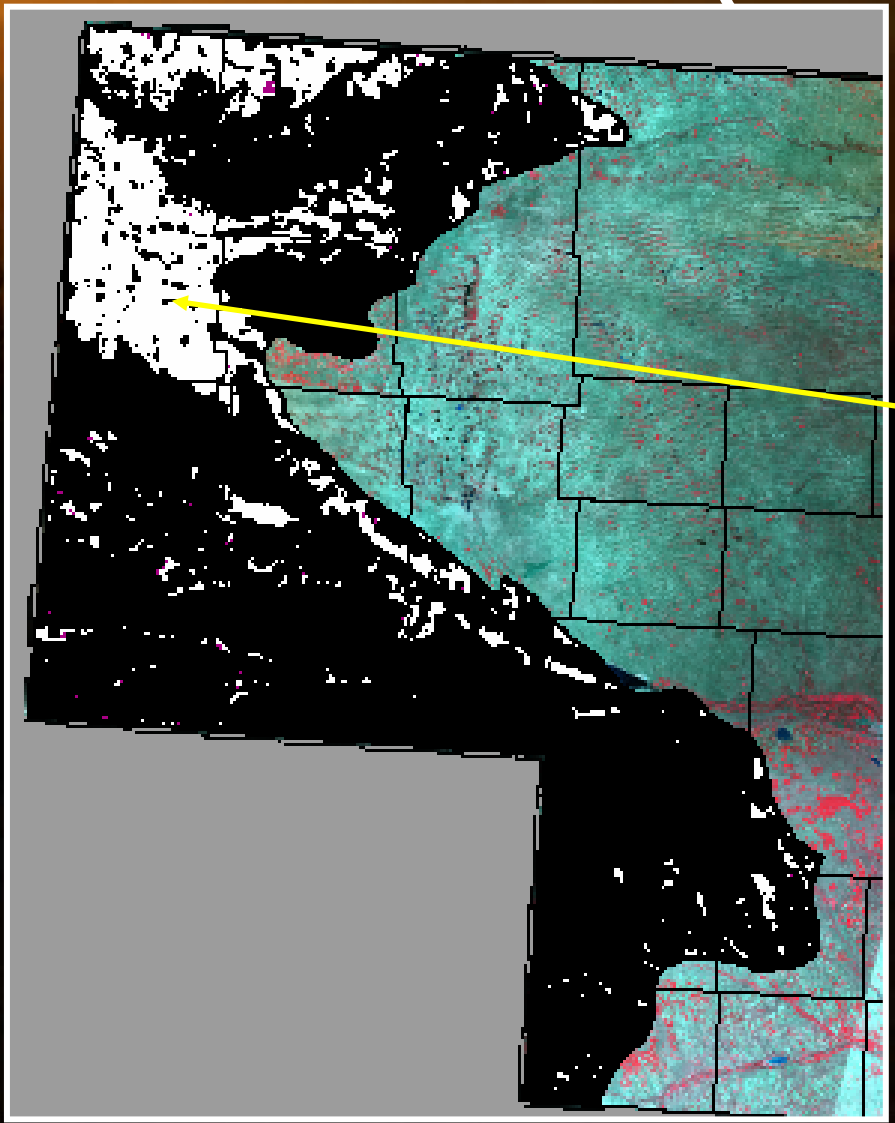
4,699,511.8 **Acres**

4,368,324.3 **Grassland**

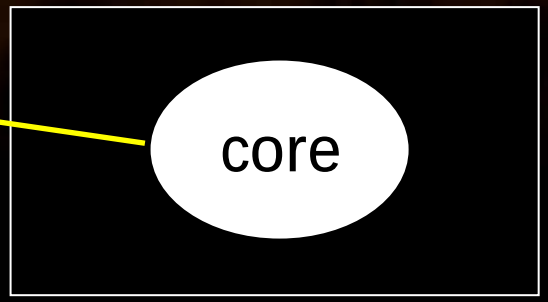
337,838.8 **CRP**

GIS Process:

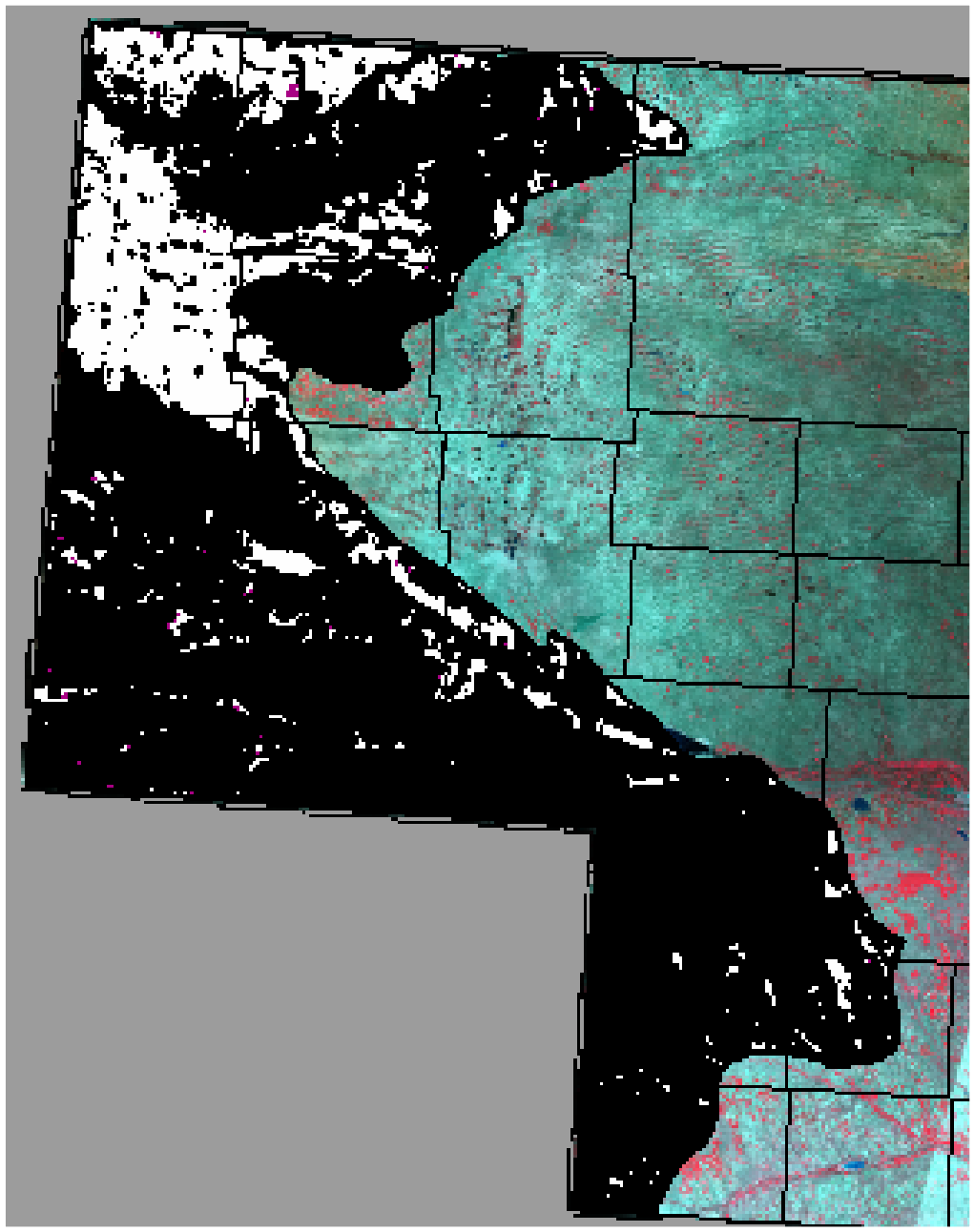
Extract Core: Meeting Landscape within window (Contiguous/non-contiguous)



All “core” acceptable grassland remains



GIS Process:



All:

4,699,511.8 Acres
4,368,324.3
Grassland
337,838.8 CRP

Suitable W/CRP:

2,068,257.8 Acres Total
2,050,921.4 Grassland
17,264.7 CRP

Suitable W/out CRP:

1,930,577.2 Acres Total
137,680.5 acre loss

BCR 18 Landscape	9269328.4
Grass (No CRP)	4368324.3
% Grass Landscape	47.1%
Grass w/CRP	4699511.8
% Grass Landscape	50.7%
CRP Large Block	17264.7
CRP Small Block	313922.7
CRP Total	331187.4
Acceptable Grass w/out CRP	1930577.2
% Landscape	20.8%
Acceptable Grass with CRP	2068257.8
Percent Landscape	22.3%
Large Block CRP created	137680.5
Return by targeting CRP	797.5%
Percent CRP targeted	5.2%

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Database Shows Benefit:

2,207,829.1 Acres Total
2,190,564.4 Grassland
17,264.7 CRP

Species	Pre- # Indivs.	Pre- % of Goal	Post- # of Indivs.	Post- % of Goal	% Gain
Sharp-tailed Grouse	3,088	48%	3,504	55%	6.6%
Long-billed Curlew	2,162	61%	2,453	69%	8.2%

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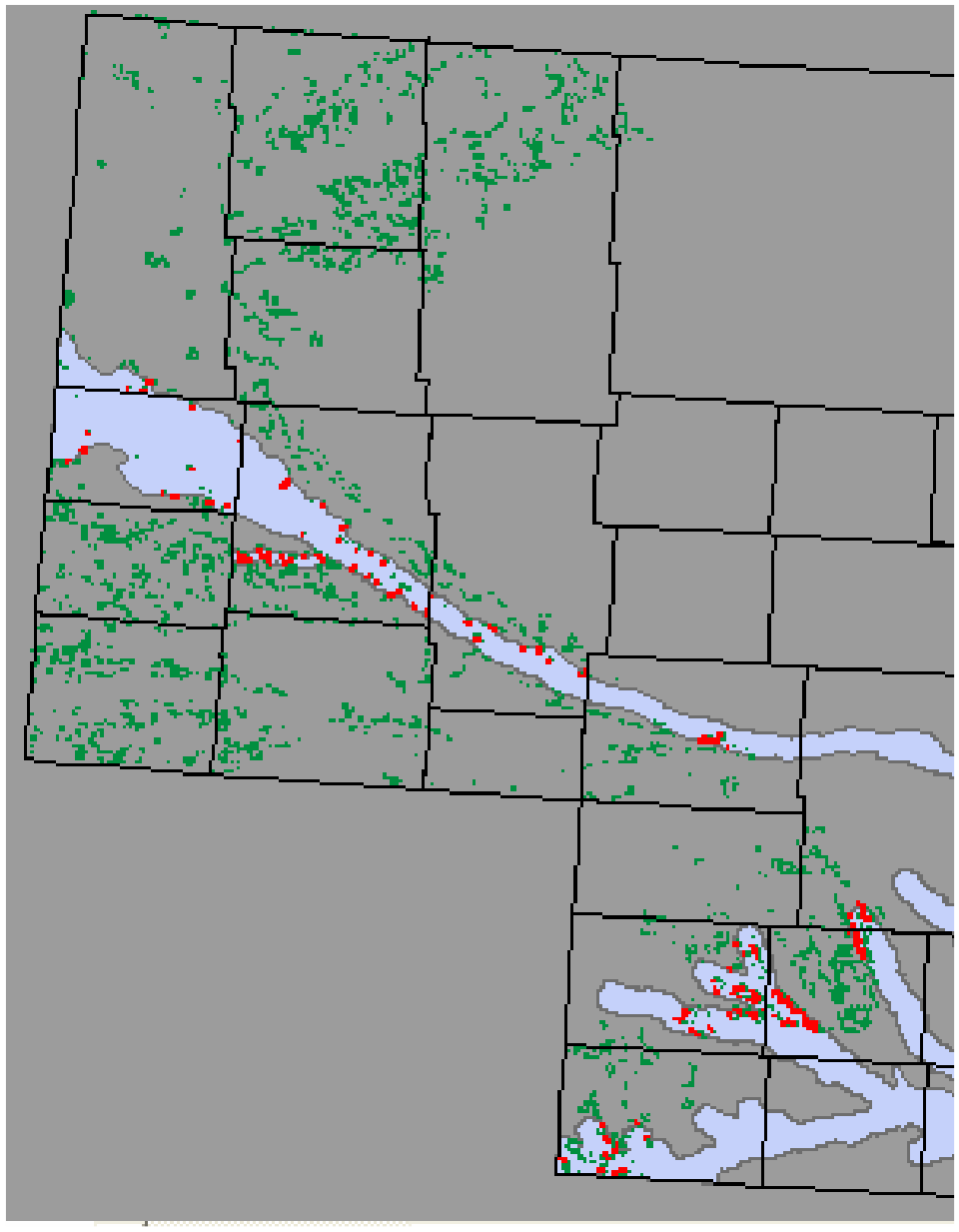
Potential Ag Conversion SW CREP



- Grass between 1100 to 1250 acres in window
- Ag fields
- With a 150 acre investment of habitat develop suitable landscape
- 296 fields in SW CREP
- 23,550 acres potential

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Questions