Incorporation of Ecological Sites with Avian Habitat Monitoring

Mary Williams, Ginger Paige,

Ann Hild, and Tom Thurow

Rangeland Ecology and Watershed Management

Department of Renewable Resources

U.S. FISH & WILDLIFE SERVICE

USGS science for a changing world

Wyoming Cooperative Fish & Wildlife Research Unit

UNIVERSITY OF WYOMING New Thinking

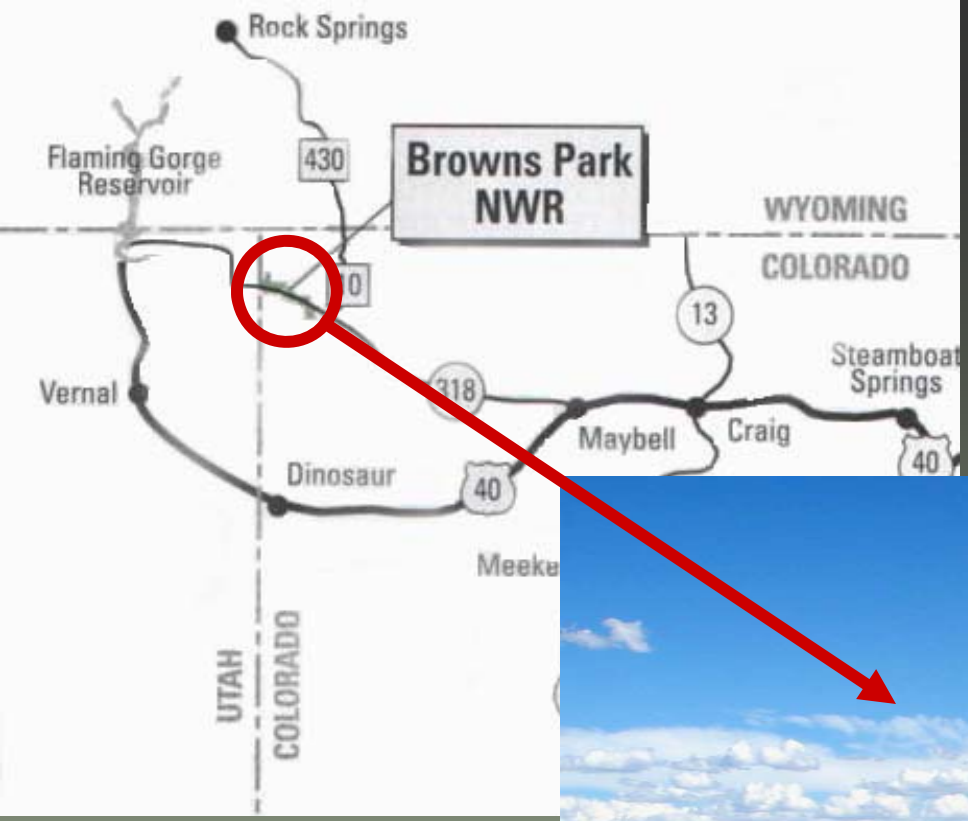
Introduction

- Assessment, monitoring and management of rangelands have changed
  - Ecological Sites
  - Monitoring Indicators
  - Challenges
    - Seldom related to wildlife habitat
    - Limited knowledge on linkages
    - Level of scale

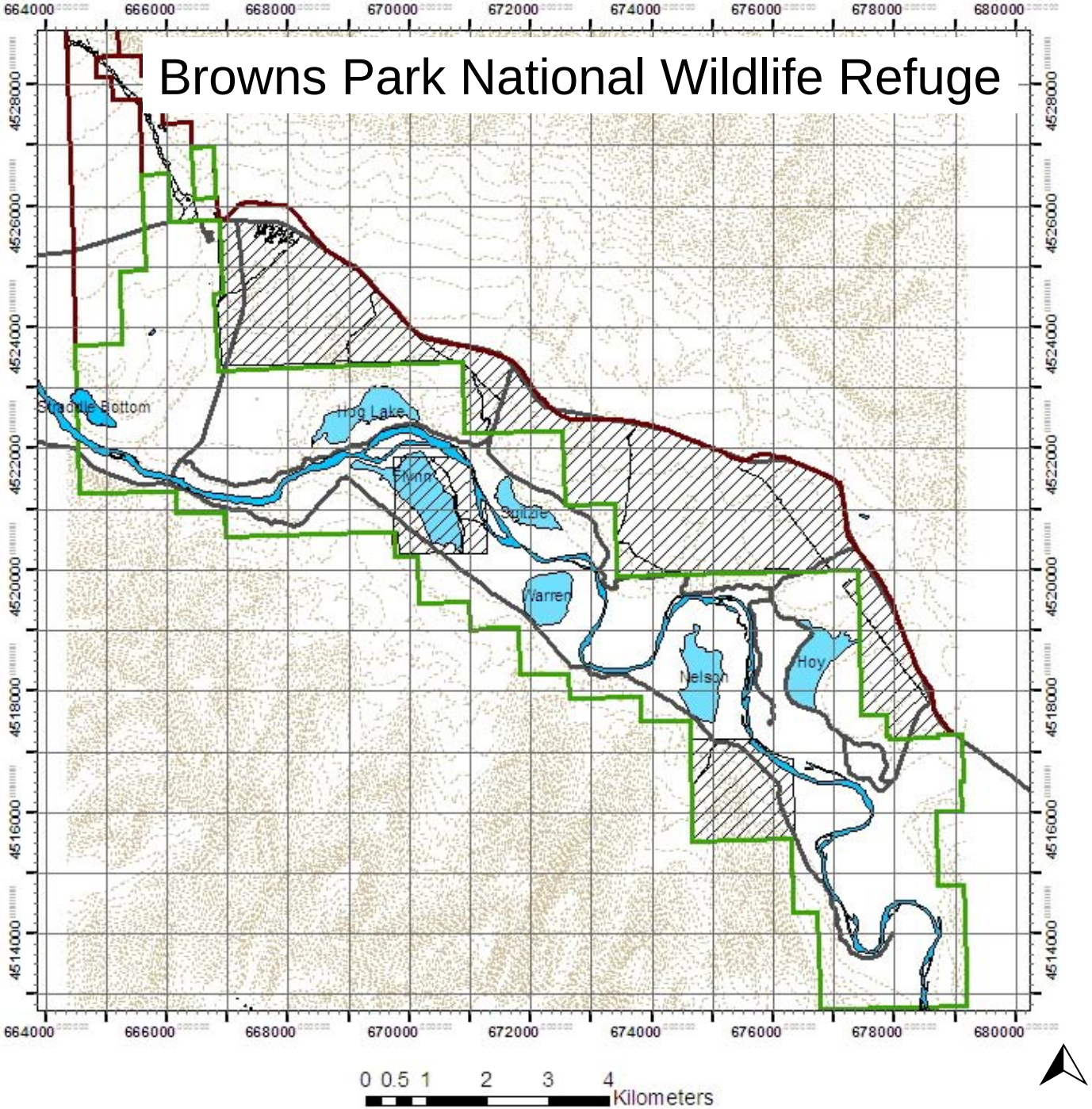
Objectives

1. Define and describe ecological sites
2. Relate avian densities to habitat
3. Identify appropriate monitoring methods
4. Link avian habitat with ecological site indicators

Study Area

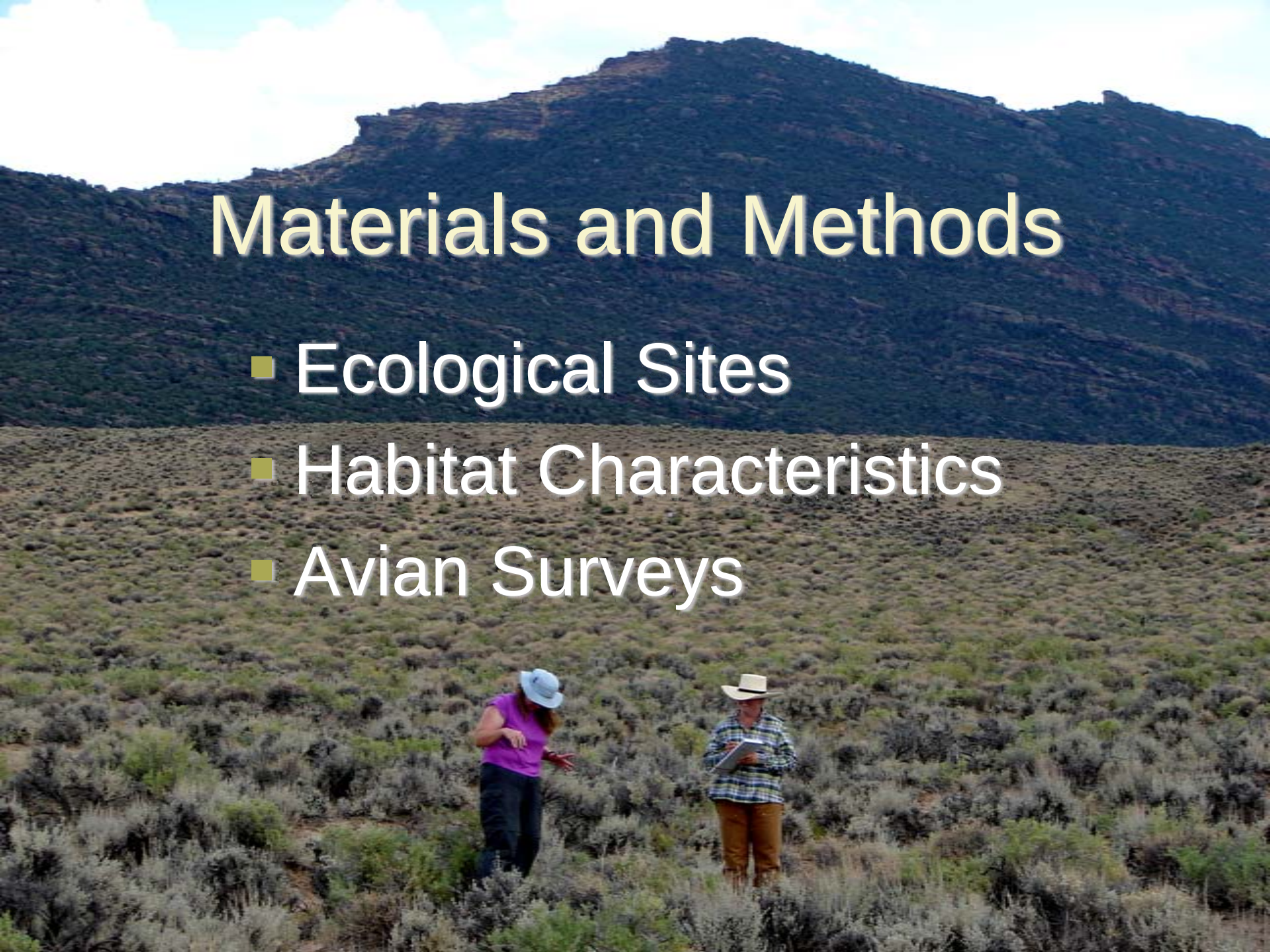

Rock Springs
Flaming Gorge Reservoir
430
Browns Park NWR
WYOMING
COLORADO
13
Steamboat Springs
Vernal
318
Maybell
Craig
40
Dinosaur
40
Meeke
UTAH
COLORADO

Browns Park National Wildlife Refuge

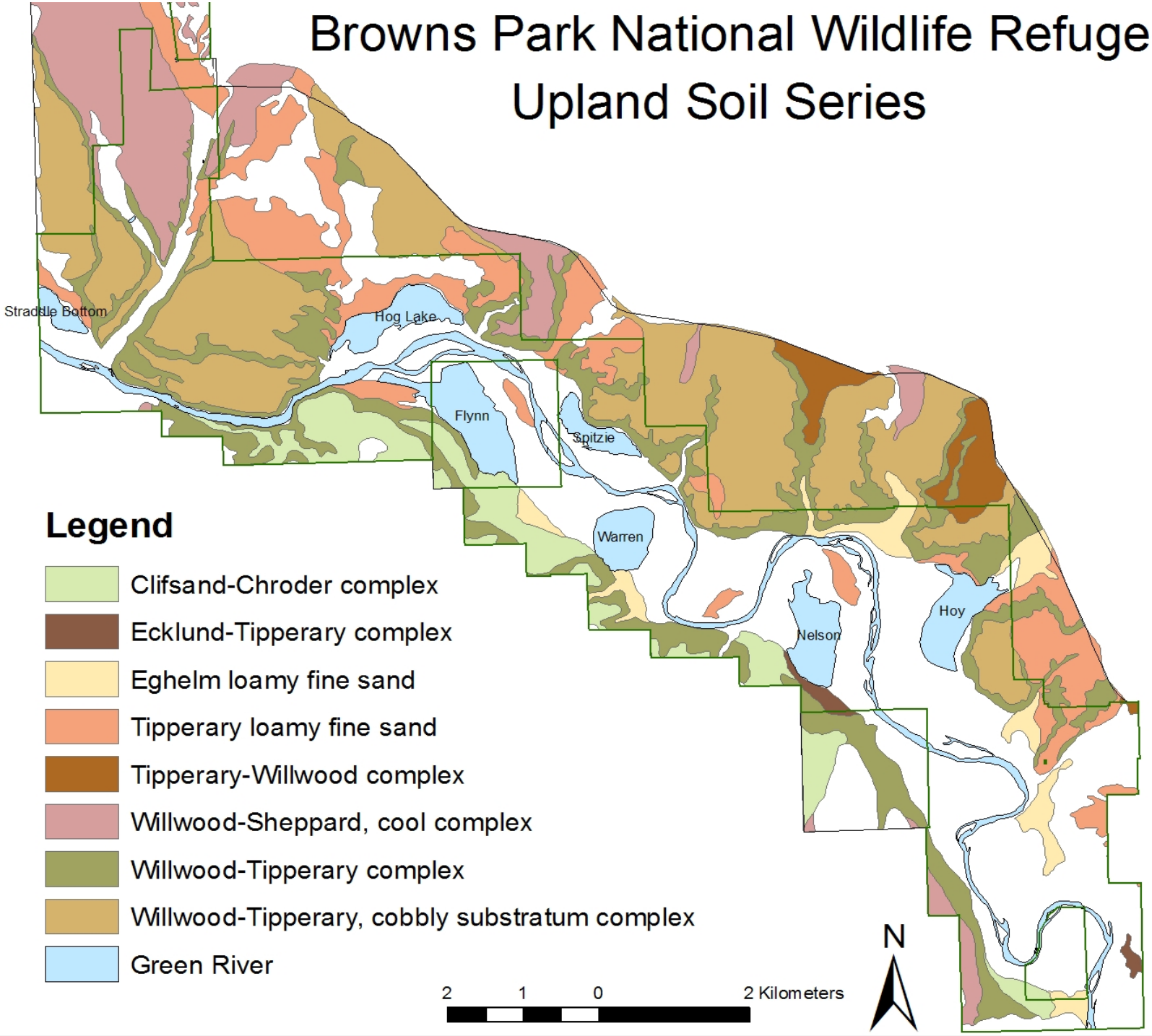


Materials and Methods

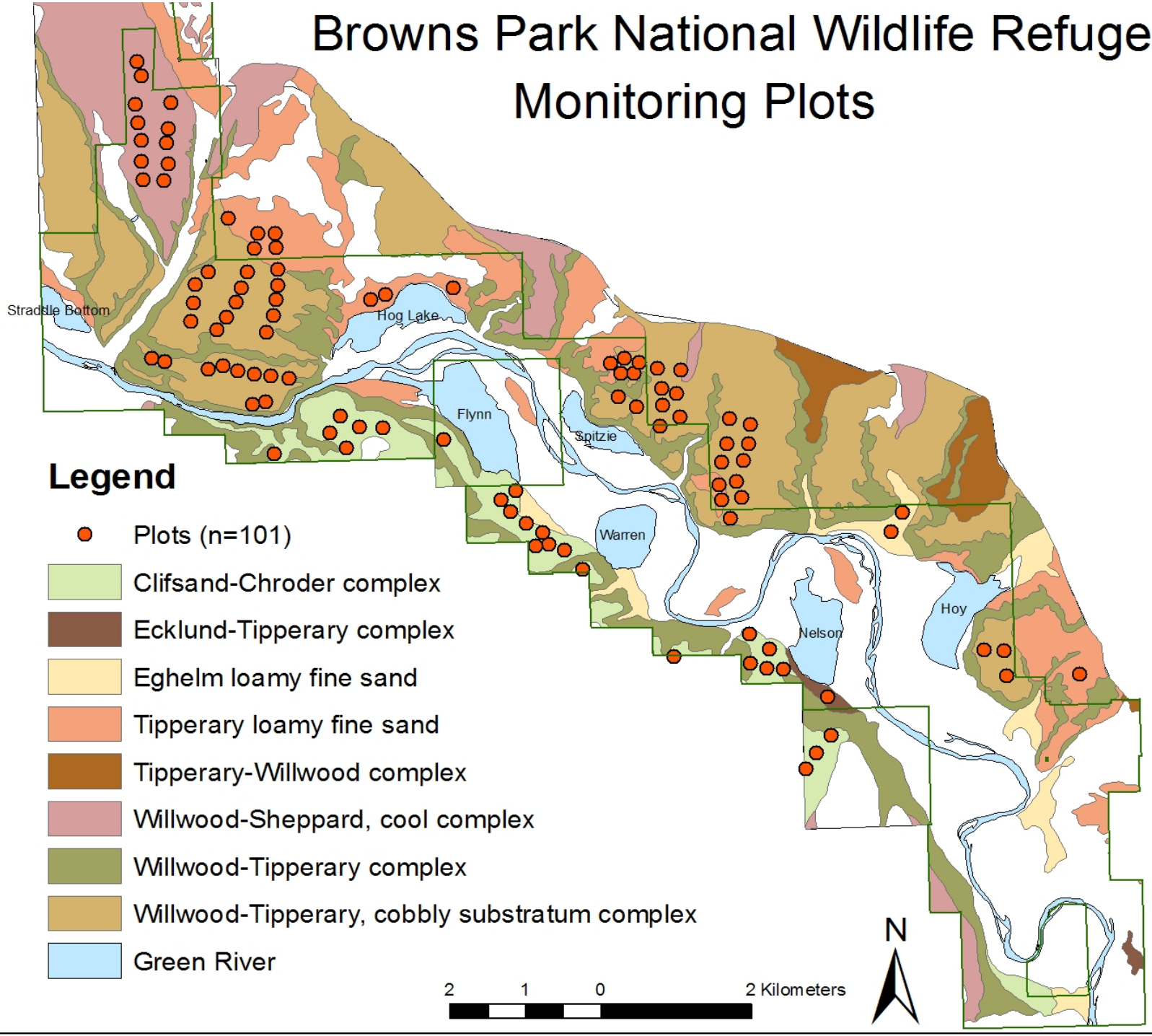
- Ecological Sites
- Habitat Characteristics
- Avian Surveys



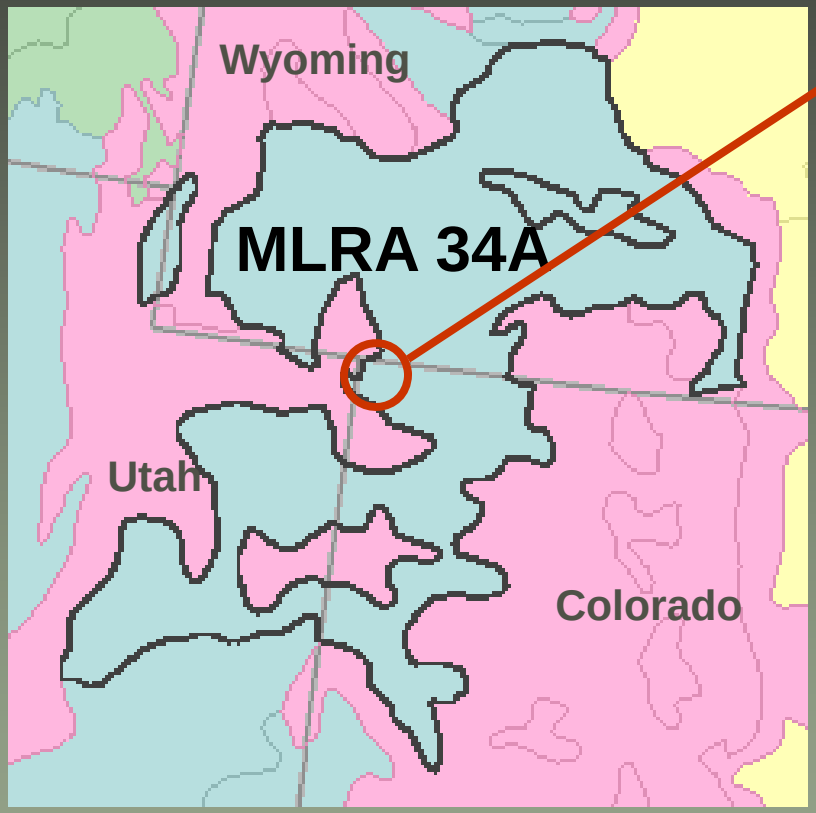
Browns Park National Wildlife Refuge
Upland Soil Series



Browns Park National Wildlife Refuge
Monitoring Plots



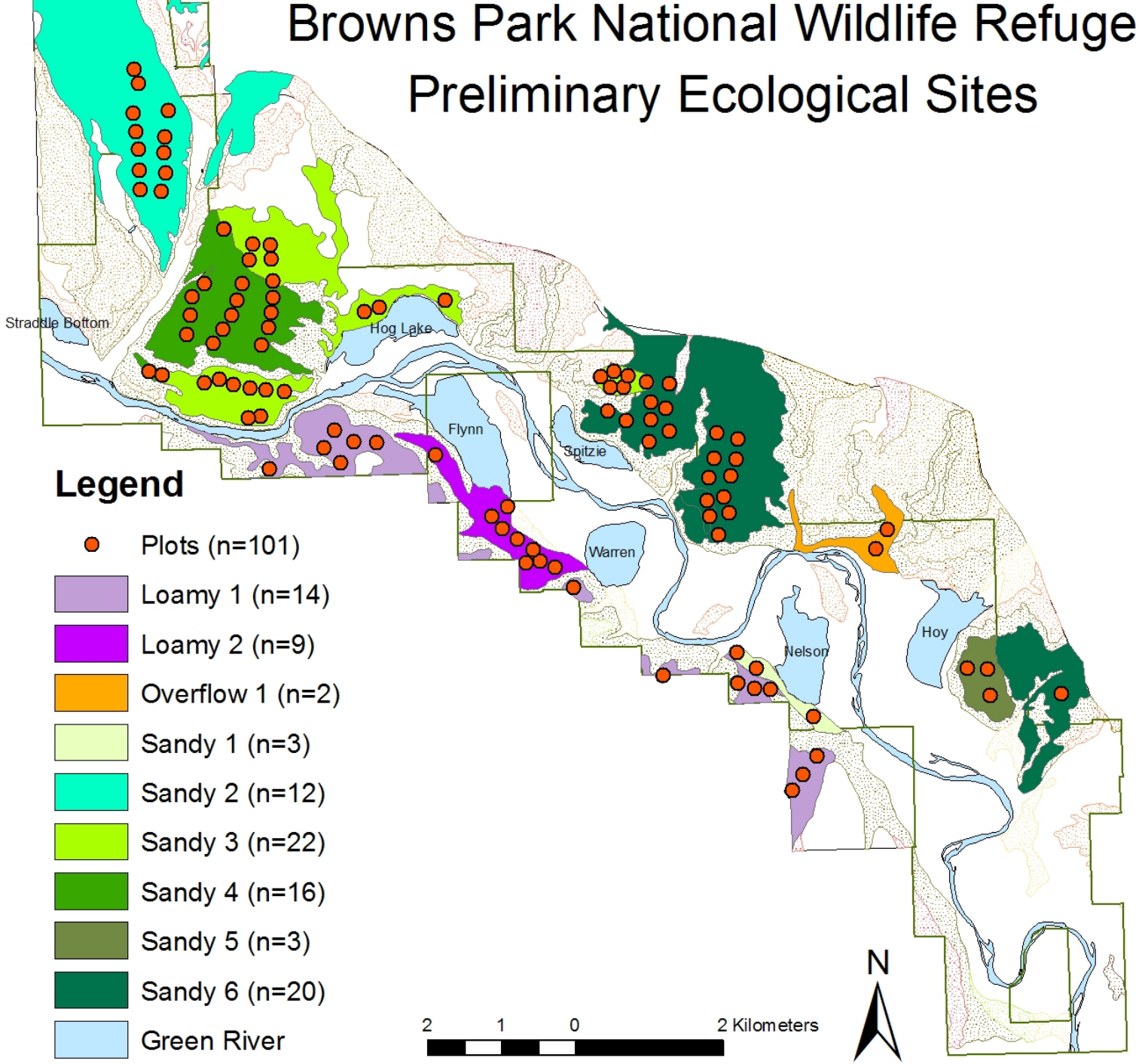
Ecological Sites



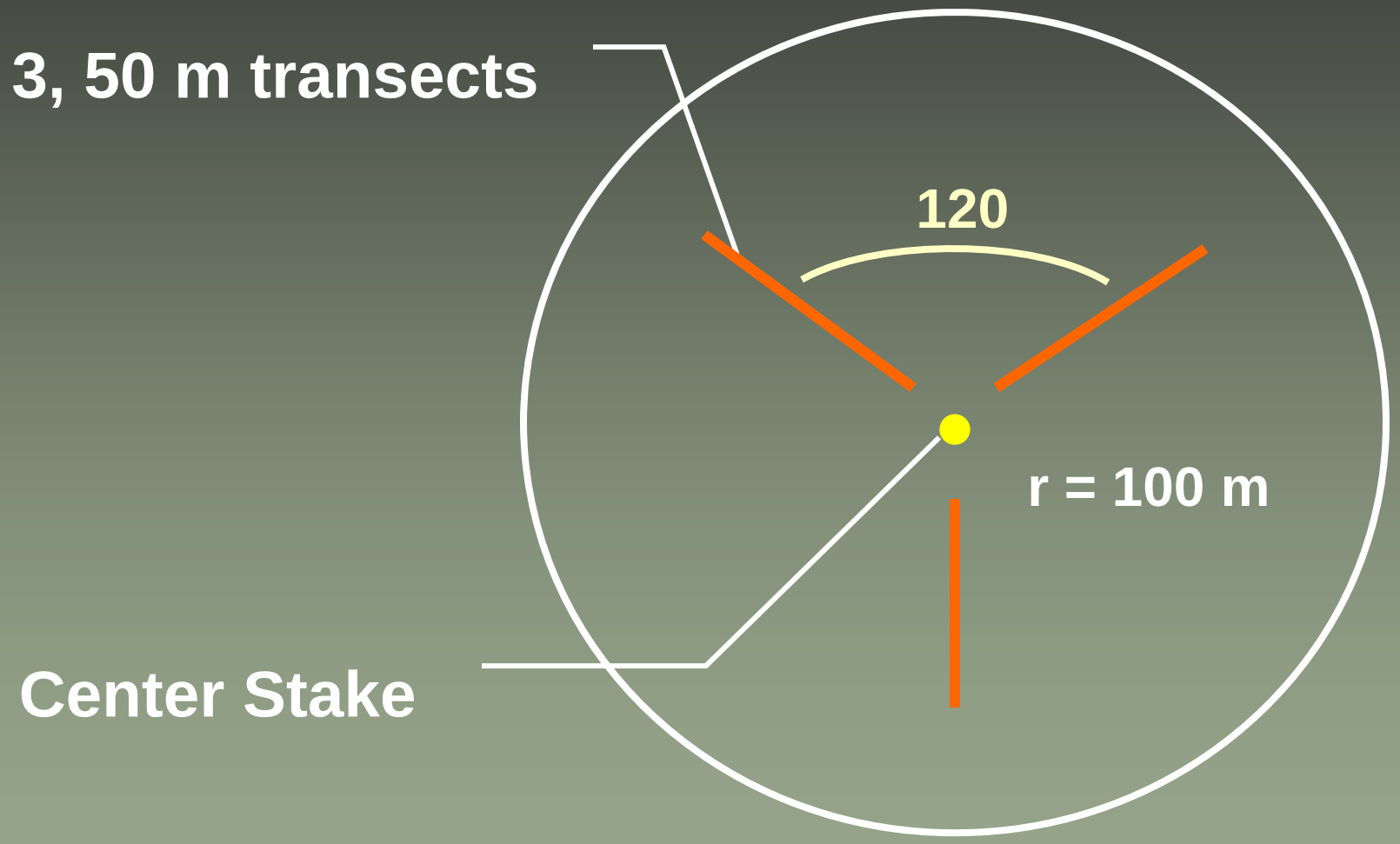
Soil and Vegetation
+
Habitat Characteristics =
(plant cover)

Loamy (2)
Overflow (1)
Sandy (6)

Browns Park National Wildlife Refuge
Preliminary Ecological Sites



Habitat Characteristics



Not to scale

Habitat Measurements*

Method	Indicator
Line Point Intercept	Cover (%), plant height
Gap Intercept	Basal and canopy gap, shrub height
Belt Transect	Shrub height, density, diversity Shrub intercanopy structure NVCS alliance cover
Soil Stability Test	Soil surface integrity

* Monitoring Manual for Grassland, Shrubland, and Savannah Ecosystems (Herrick et al. 2005)

Point Transect Surveys

Methods

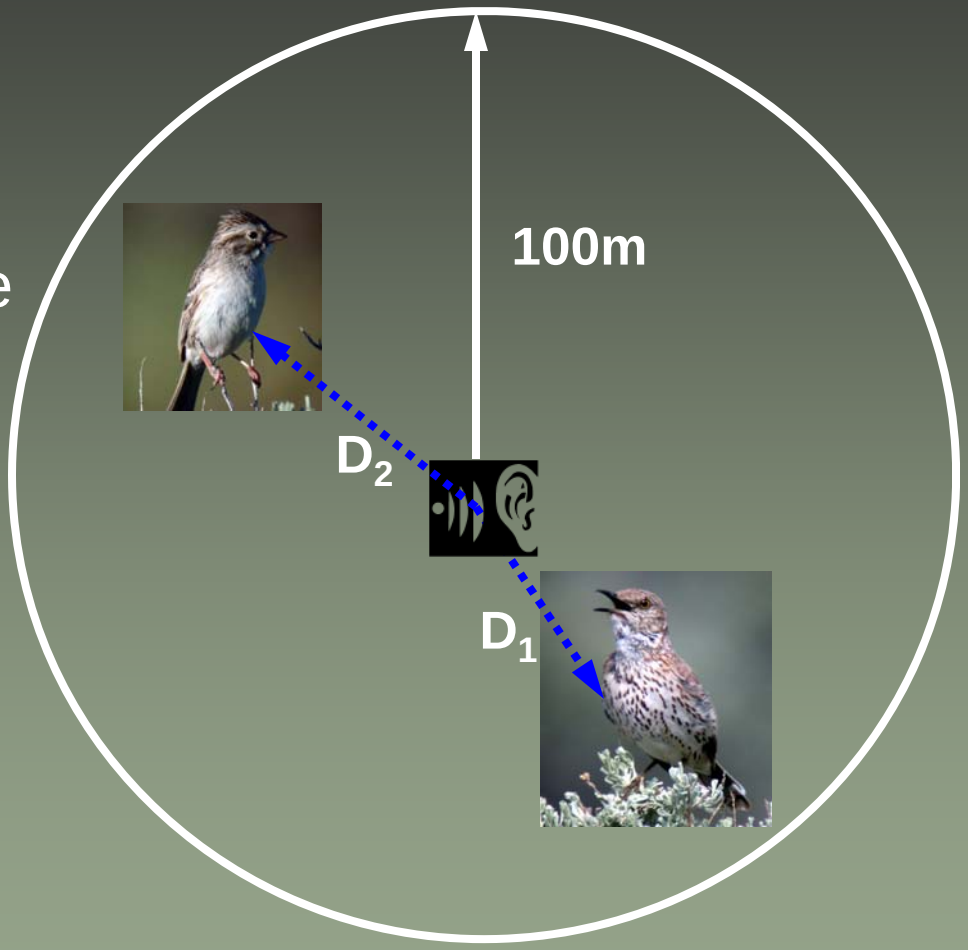
- 5-min observation
- Record species and distance

Metrics

- Density
- Species Richness

Sampling Dates

- May 6-11 and 26-30, 2006
- May 6-11 and 23-27, 2007



Data Analysis

Avian Density

Estimate density by ecological site

Program DISTANCE

Habitat Characteristics

Summarize habitat variables by site

- plant cover (LPI)
- plant height (LPI)
- shrub height (LPI and Gap)

Ecological Sites

Determine habitat variables that distinguish ecological sites

Results

- Avian Surveys
- Ecological Sites and Habitat Characteristics

Species Observed

American Goldfinch
American Robin
Black-billed Magpie
Blue-gray Gnatcatcher
Brewer's Blackbird
Brown-headed Cowbird
Chipping Sparrow
Eastern Kingbird
Green-tailed Towhee
Mountain Bluebird
Mourning Dove
Red-shafted Flicker
Rufous-sided Towhee
Savannah Sparrow
Say's Phoebe
Song Sparrow
Western Kingbird
White-crowned Sparrow

Detections > 30

Sagebrush Obligates

Brewer's Sparrow

Sage Sparrow

Sage Thrasher

Shrubland and Grassland

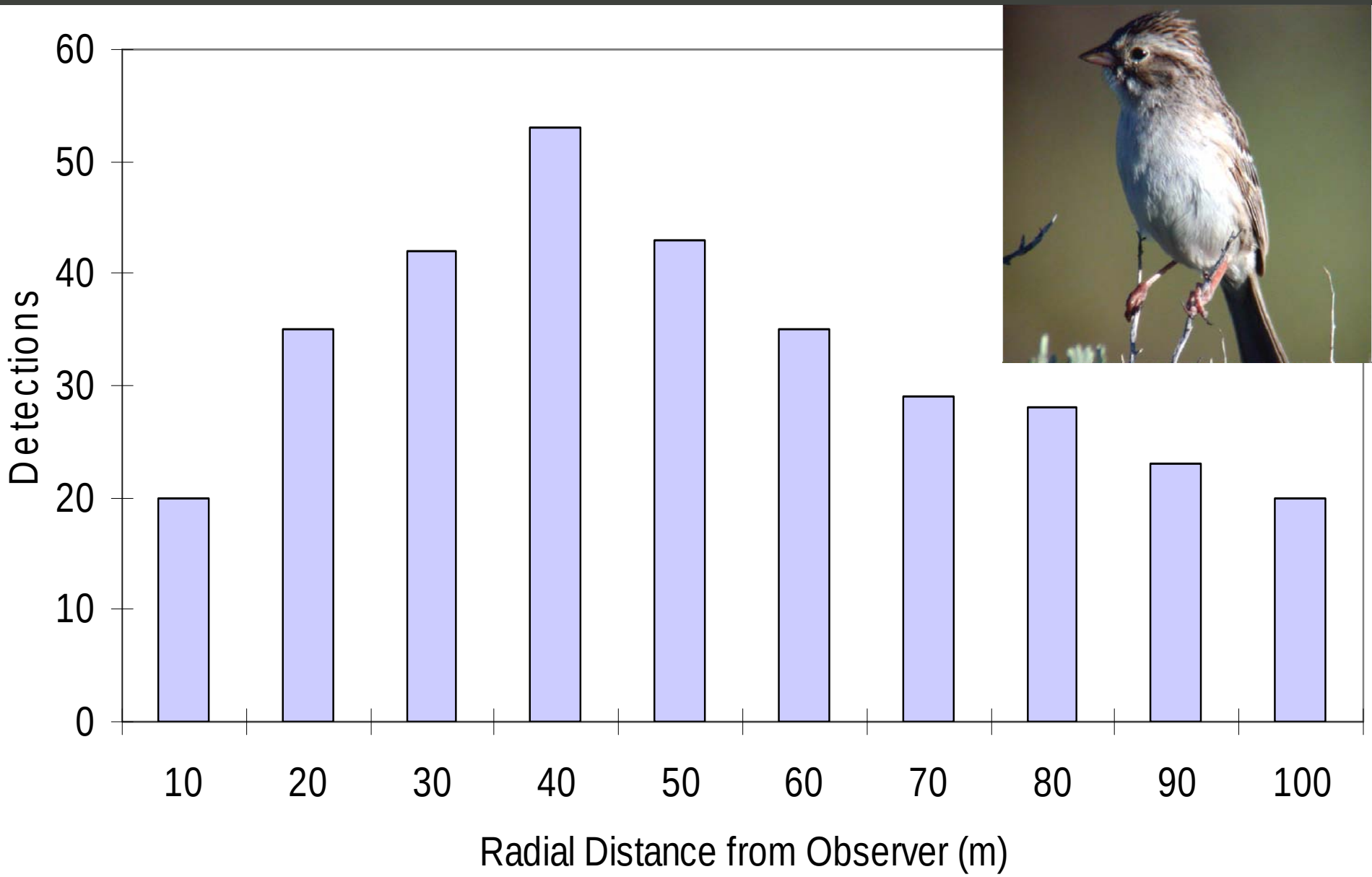
Lark Sparrow

Vesper Sparrow

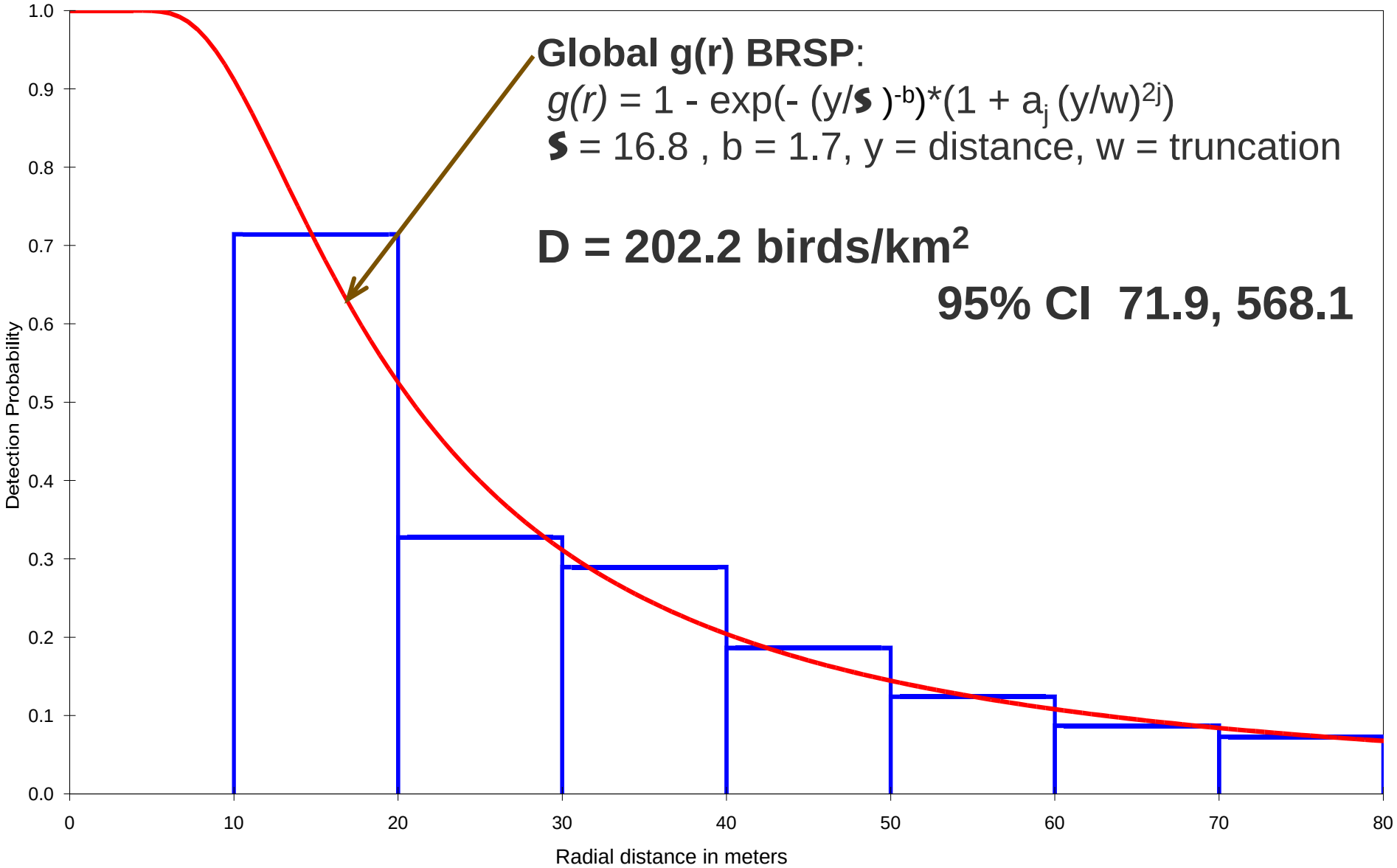
Horned Lark

Western Meadowlark

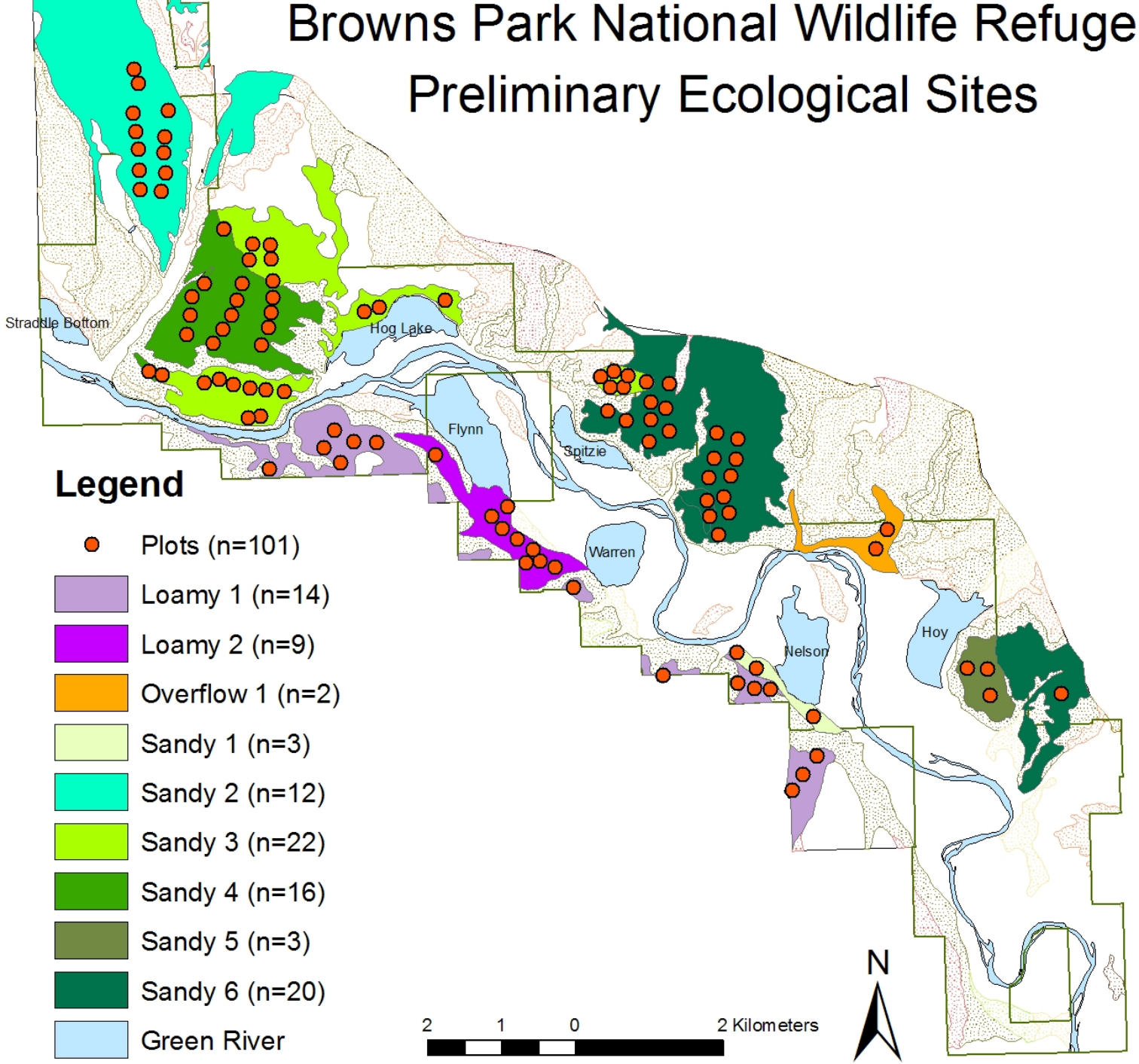
Brewer's Sparrow (n=327)



Detection Function: BRSP



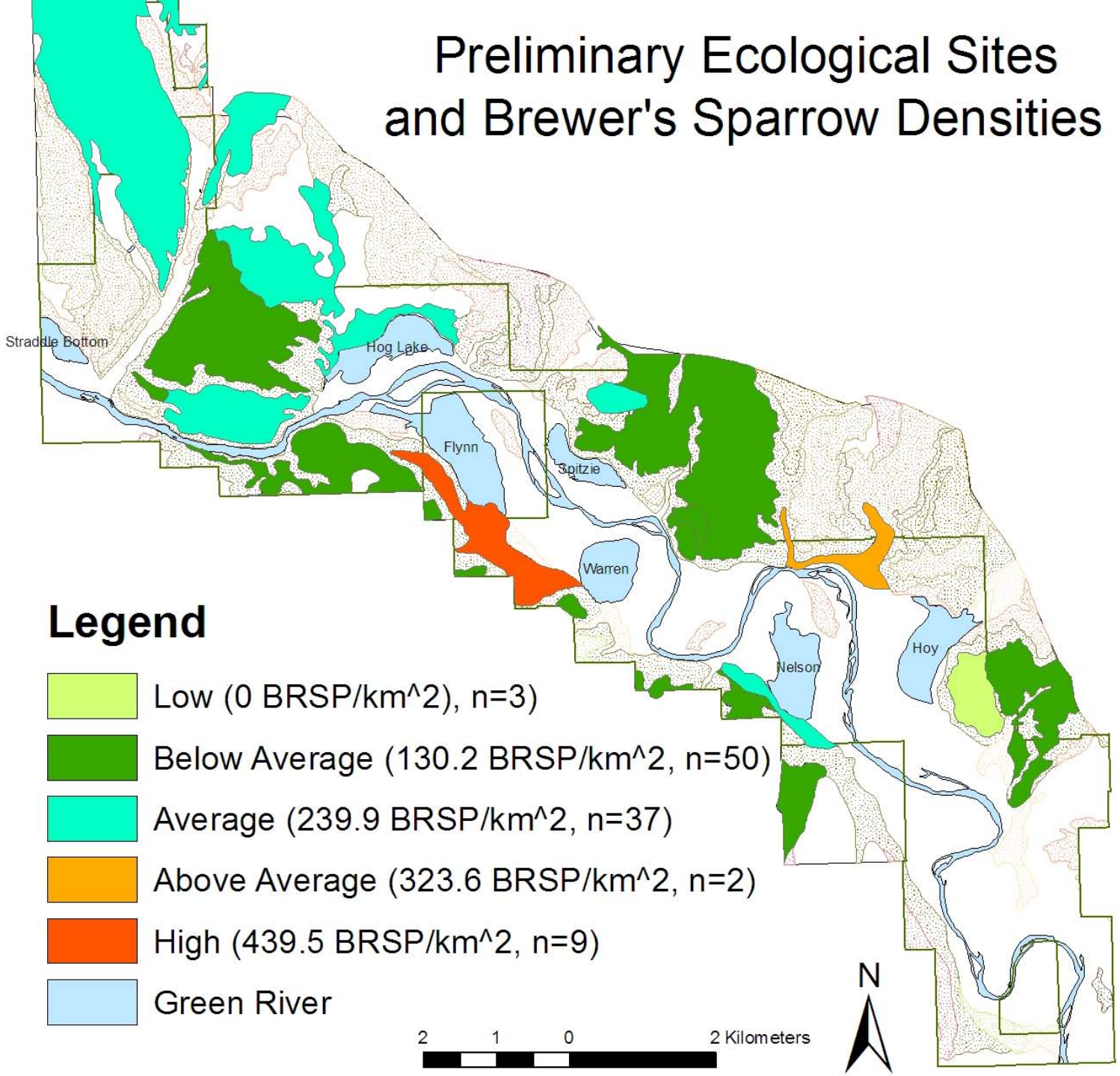
Browns Park National Wildlife Refuge
Preliminary Ecological Sites



Brewer's Sparrow Density by Ecological Site

	Ecological Site	**BRSP/km^2** (CV)
Low	Sandy 5	**0** (0)
Below Average	Sandy 4	**116.8** (58.2)
	Loamy 1	**133.6** (62.2)
	Sandy 6	**140.2** (58.6)
Average	Sandy 1	**215.7** (67.9)
	Sandy 2	**245.7** (56.9)
	Sandy 3	**258.2** (56.8)
Above Average	Overflow 1	**323.6** (57.1)
High	Loamy 2	**439.5** (56.9)

Preliminary Ecological Sites and Brewer's Sparrow Densities



Brewer's Sparrow Density and Vegetation Height by Ecological Site

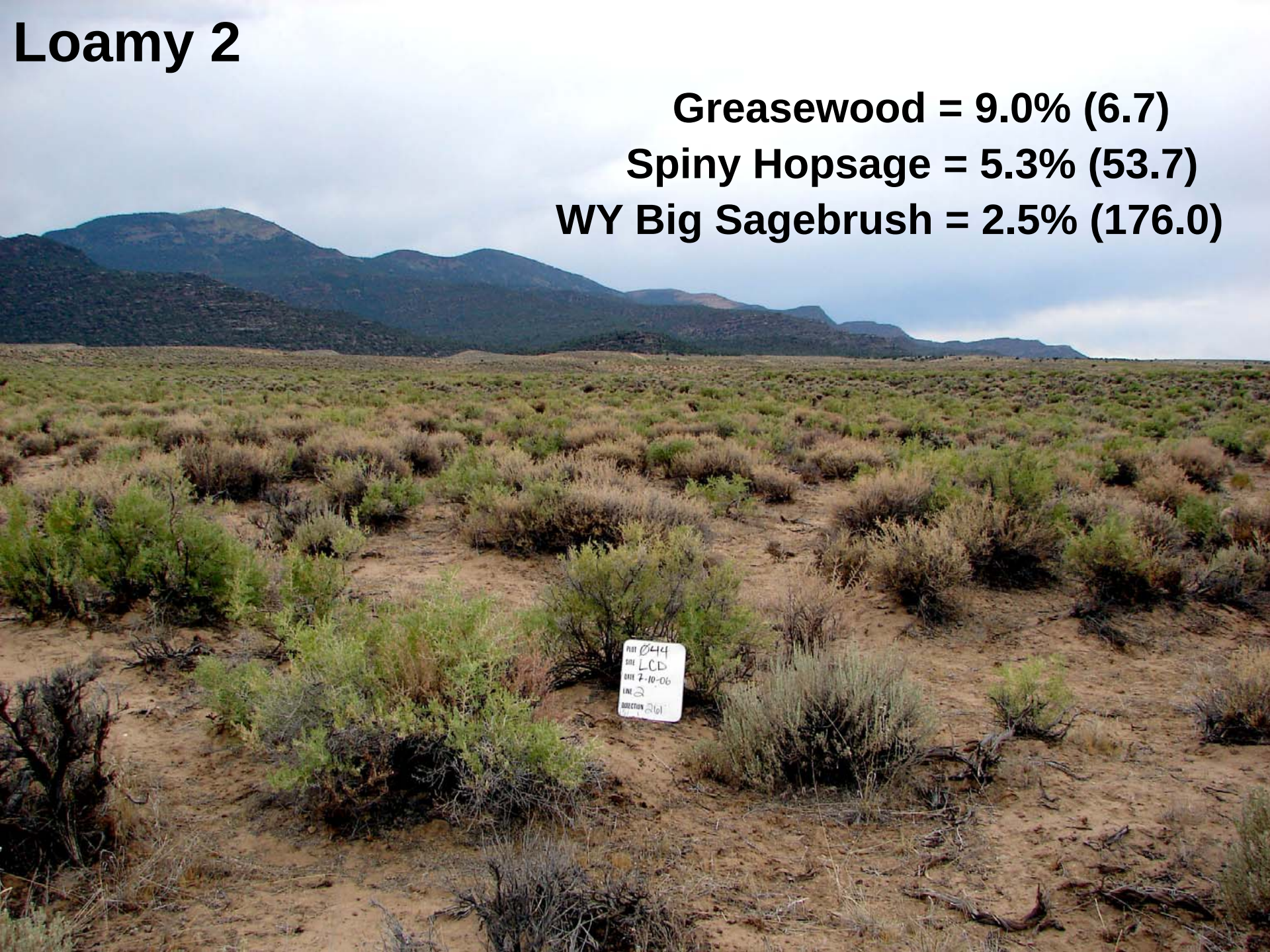
Ecological Site/BRSP Density	BRSP/ km^2	Shrub Gap Ht (cm)	Shrub LPI Ht (cm)	Plant LPI Ht (cm)
Low	0.0	15.7	14.4	10.8
Below Average	130.2	27.9	22.2	15.0
Average	239.9	37.1	25.9	22.6
Above Average	323.6	53.8	34.1	30.5
High	439.5	49.4	32.0	25.4

Brewer's Sparrow Density and Cover by Ecological Site

Ecological Site/BRSP Density	BRSP/ km^2	Greasewood (%)	Shadscale (%)	Spiny Hopsage (%)	Winterfat (%)	Canopy Cover (%)	Bare Ground (%)
Low	0.0	0.45	4.7	0.4	14.6	23.6	56.2
Below Average	130.2	2.2	6.3	1.7	0.2	34.9	37.8
Average	239.9	11.8	2.5	3.5	0.1	35.0	42.5
Above Average	323.6	42.7	0.0	0.0	0.0	50.7	31.3
High	439.5	9.0	0.1	5.3	0.0	26.2	48.0

Loamy 2

Greasewood = 9.0% (6.7)
Spiny Hopsage = 5.3% (53.7)
WY Big Sagebrush = 2.5% (176.0)



Discussion

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Acknowledgements

- USFWS
- USGS
- BPNWR
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