Section-based Monitoring of Breeding Birds on Four National Grasslands

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EXECUTIVE SUMMARY

In 2002, Rocky Mountain Bird Observatory (RMBO), under contract with the United States Forest Service (Forest Service), implemented a grassland bird monitoring strategy as a pilot project on 5 National Grasslands in the Great Plains. The objective is to monitor population trends and distribution of grassland birds at the scale of a National Grassland. Monitoring at this scale provides Grassland-specific data, resulting in more effective land management decisions regarding conservation of grassland birds and their habitat on National Grasslands.

In 2003, we surveyed 4 National Grasslands under the same strategy including, Grand River (South Dakota), Comanche (Colorado), Kiowa (New Mexico), and Rita Blanca (Oklahoma/Texas) National Grasslands. This document reports our findings.

INTRODUCTION

Grassland birds have experienced steeper, more consistent, and geographically more widespread declines than any other guild of North American avian species (Sampson and Knopf 1996). Partners in Flight found that 11% of shortgrass prairie birds are declining and 66% lack enough data to assess population trends and stability (Partners in Flight Species Assessment Database 2002). Conversion of native prairie to cropland is 1 of the factors contributing to these declines.

The Forest Service administers 3.5 million acres of National Grasslands in the Great Plains. Within the grassland bird community, some species have been designated as sensitive by the Forest Service because there is a viability concern. This concern is evidenced by either significant current or predicted downward population trends or density, or significant current or predicted downward trends in habitat capability that would reduce the species' existing distribution. Sensitive species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing. There must be no impacts to a sensitive species without an analysis of the significance of adverse effects on its population, its habitat, and on the viability of the species as a whole. Adequate monitoring information is central to environmental impact analyses and effective avian conservation and management. The Forest Service recognizes the importance of establishing a coordinated avian monitoring program (Manley 1992). However, comprehensive avian monitoring data does not exist for National Grasslands.

Some managers have relied on data derived from the Breeding Bird Survey (BBS), currently the most extensive bird-monitoring program, to monitor bird populations (Robbins et al. 1989, Sauer 1993). The BBS, operational in the Great Plains since 1967, enlists volunteers to conduct roadside surveys of birds across North America and produces indices of population abundance at the continental scale for many common bird species (Robbins et al. 1989). BBS data and analyses are relatively inexpensive and have proven to be a valuable source of information on bird population trends. BBS data can be used to produce continental-scale relative abundance maps. These maps provide a reasonably good indication of the relative abundances of species that are well sampled by the BBS. However, many species and habitats are inadequately sampled by the BBS (Robbins et al. 1993, Sauer 1993), and BBS data do not reliably predict population trends at small geographic scales such as a National Grassland (Sauer 2000). For

these and other reasons, BBS data are generally insufficient to guide local and regional management decisions (Leukering et al. 2000), such as those of National Grassland managers.

In response, RMBO, in cooperation with the Colorado Division of Wildlife (CDOW), assessed field techniques to determine the most efficient for monitoring shortgrass prairie bird species in eastern Colorado. Tested techniques included: 1) road-based point counts, conducted at the section level from roads, 2) interior line transects, conducted at the section level away from roads, 3) Monitoring Colorado Birds (MCB) point transects, conducted irrespective of sections and roads, and 4) 30-mile driving line transects, conducted along roads (Hanni 2002). The results indicated that road-based point counts were the most efficient technique tested.

Since then, CDOW, Nebraska Game and Parks Commission, Kansas Department of Wildlife and Parks, Oklahoma Department of Wildlife Conservation, New Mexico Department of Game and Fish, and the Forest Service have implemented the section-based monitoring program on sections throughout the Shortgrass Prairie Bird Conservation Region (BCR 18) using the road-based point count technique (Hanni 2002) (Figure 1). In 2003, section-based monitoring of shortgrass prairie birds was conducted on 4 National Grasslands: Grand River, Comanche, Kiowa, and Rita Blanca. This document reports our findings.

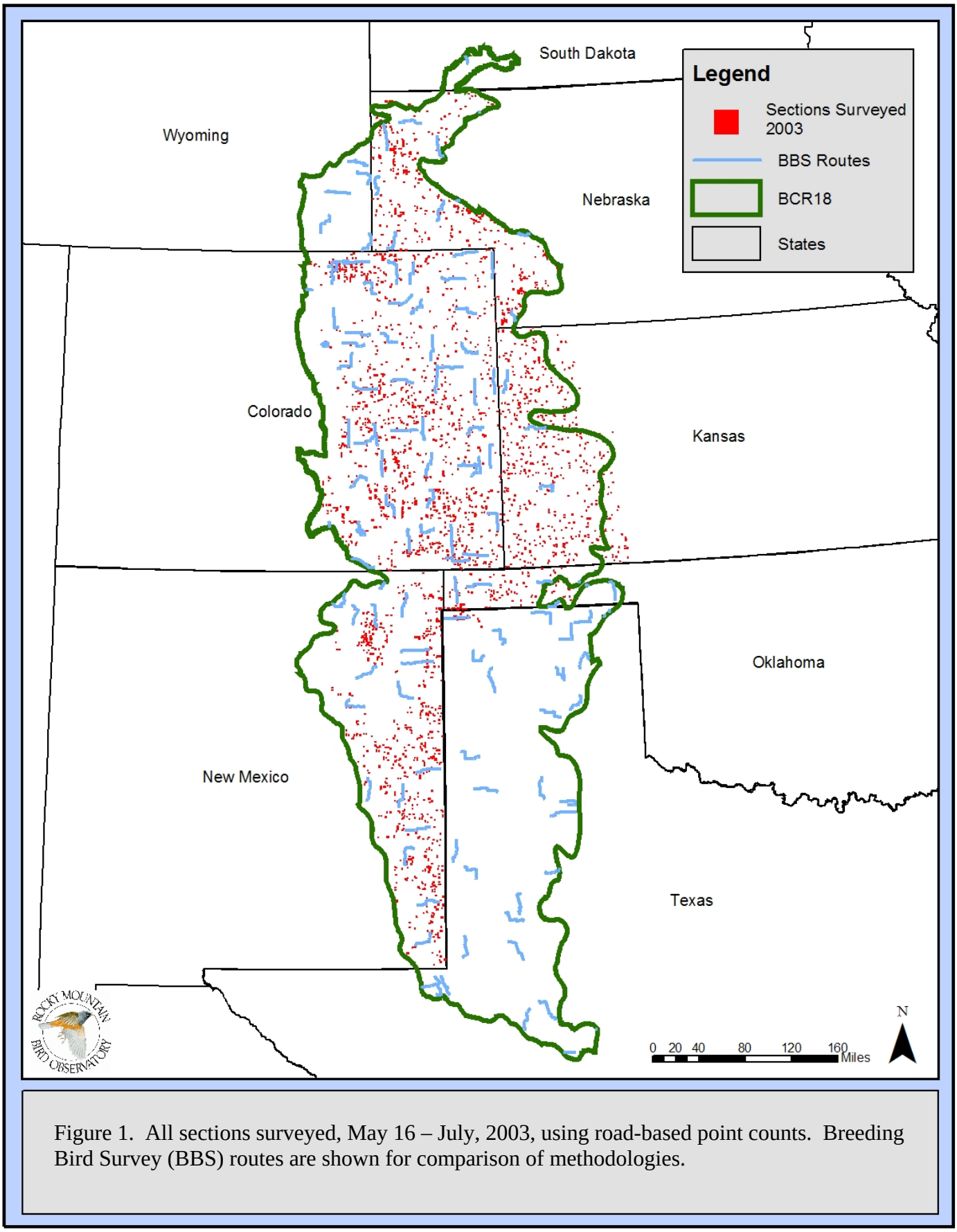

Figure 1. All sections surveyed, May 16 – July, 2003, using road-based point counts. Breeding Bird Survey (BBS) routes are shown for comparison of methodologies.

METHODOLOGY

Study Area:

Section-based monitoring using road-based point counts was conducted on Grand River, Comanche, Kiowa, and Rita Blanca National Grasslands May 16 – July 3, 2003. This arid region receives 300-500 mm of precipitation per year and is characterized by 2 dominant grasses, buffalo grass (*Buchloe dactyloides*) and blue grama (*Bouteloua gracilis*) (Lauenroth 1992).

Section Selection:

Sections are defined by the Public Land Survey System (PLSS) as 1 mi^2 parcels of land and are the sampling units of section-based monitoring. Prior to field season, we used GIS to randomly select homogenous sections (600 - 700 acres) of Forest Service land that lie adjacent to at least 1 road (Figures 2). If, during the field season, a section was determined not to meet these criteria, it was replaced with the closest qualifying section in a randomly selected direction. In 2003, a total of 264 sections were selected for surveying on National Grasslands: 42 on Grand River, 133 on Comanche, 58 on Kiowa, and 31 of Rita Blanca.

Road-based Point Count Technique:

A point count data collection process modified from Buckland et al. (1993) was used to establish road-based point counts. Three road-based point counts, located at least 0.2 mi (322m) apart along the road, were conducted on each section. Four point counts per section does not yield a statistically significant difference in the number of species detected (Hanni 2002). Point count locations were determined using a random number table and were recorded using a Garmin *etrex* global positioning system (GPS) unit. Point count locations were distributed around a section based on the number of roads surrounding that section. For example, on sections adjacent to only 1 road, 3 counts were conducted from that road. On sections with 2 roads, 2 counts were conducted along 1 road, and 1 count was conducted along the other; the road on which 2 counts were conducted was randomly selected using a random number table. On sections bordered by 3 roads, 1 count was conducted along each road. Where 4 roads surrounded the section, 1 road was randomly selected and eliminated using a random number table, and the section was then treated as a three-road section.

Data Collection:

Data were collected on Grand River, Comanche, Kiowa, and Rita Blanca National Grasslands May 16 – July 3, 2003. We considered arrival and productivity periods of early and late-breeding species in the assumption that the majority of the species were on their breeding territories. Observers conducted point counts from sunrise until no later than 1100 hours when detectable activity typically lessened or ceased. We recorded survey "start" and "end" times. Surveys were not conducted during periods of rain or winds in excess of 18 mph. Observers recorded weather conditions, including cloud cover, wind speed, and temperature. Township, range, and section (TRS) of the surveyed sections were also documented.

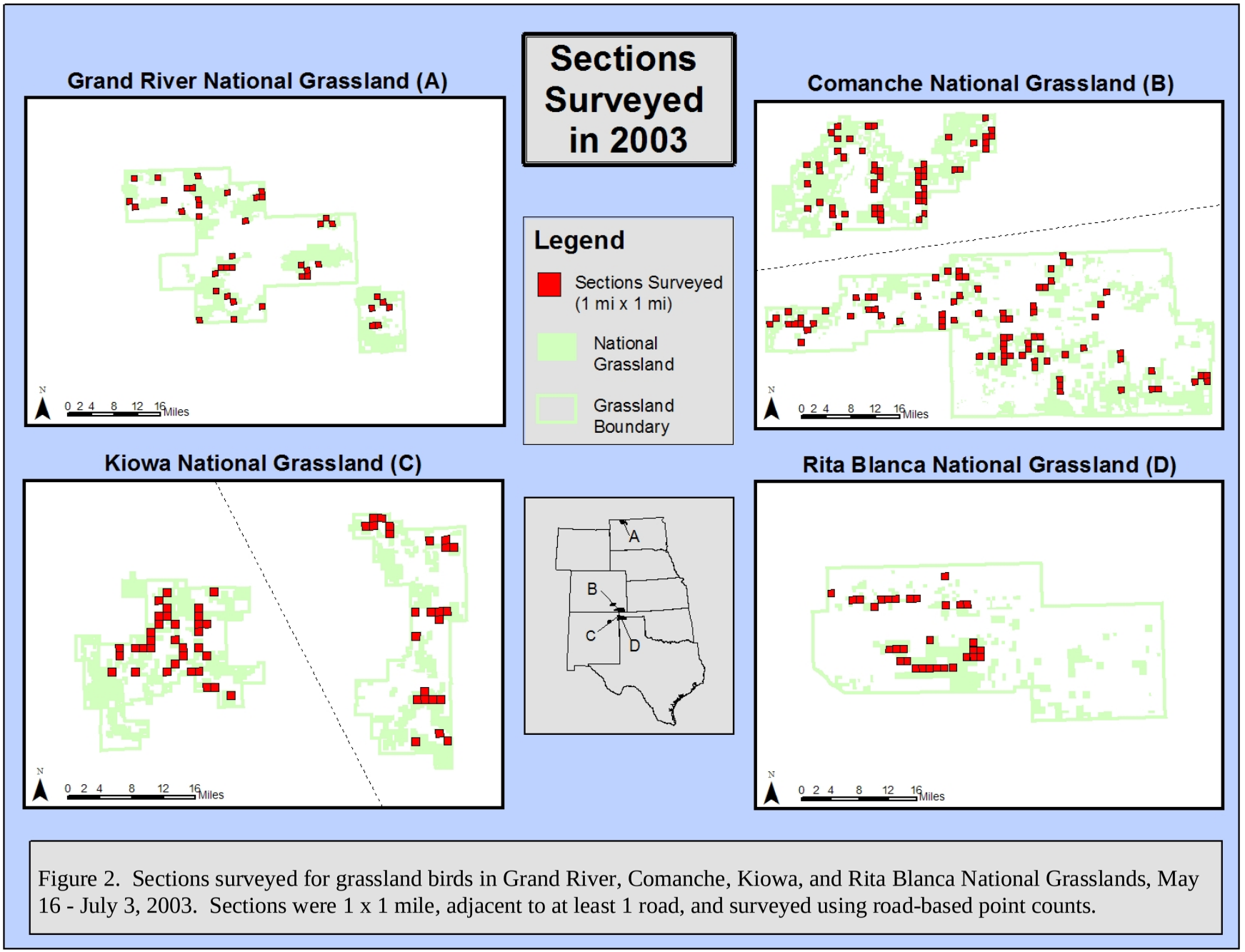

Figure 2. Sections surveyed for grassland birds in Grand River, Comanche, Kiowa, and Rita Blanca National Grasslands, May 16 - July 3, 2003. Sections were 1 x 1 mile, adjacent to at least 1 road, and surveyed using road-based point counts.

Point counts were conducted for 5 minutes looking from the road 180° into the section. All birds seen and/or heard within this section were recorded. Distance from the observer to the point of first detection was recorded for each bird observed. Distances were determined using a Bushnell Yardage Pro 500 Rangefinder. Method of detection (i.e. visually, aurally), sex (if known), and habitat association (i.e. shrub, ground, fence, etc.) were recorded. Birds flying over the section were tallied separately. From each point, we recorded vegetation characteristics, including grass height, percent shrub cover, and dominant shrub cover species, within a 150 m semicircle of the surveyed section. Grass height categories included <15 cm and >15 cm (~ankle height). When there was a combination of the 2 heights, the proportions in each category were recorded. Shrub cover data were recorded only when a shrub community was present. Technicians were provided with a reference guide to shrub percent cover that illustrated examples of shrub percent for each of the different shrub species to be encountered in the field. The categories were <1%, >1%-3%, >3%-10%, and >10%. These percentages were recorded for sagebrush, rabbit brush, four-winged salt bush, greasewood, cholla, yucca, and other species that occurred less frequently.

All black-tailed prairie dog colonies and playas visible within the section were sketched by the observer onto the data sheet. All black-tailed prairie dog colonies were documented on maps and in notes. Black-tailed prairie dog colonies, whether occupied or abandoned by prairie dogs, and playas were searched with binoculars for both Burrowing Owls and Mountain Plovers. Nests of any raptors were documented by recording UTMs and by marking the location on a map.

Technician training was provided by RMBO at the Central Plains Experimental Range near Pawnee National Grassland. The technicians were trained for 3 consecutive days via lecture and field practice. Technicians were deemed proficient in grassland bird identification (visual and aural), distance estimation with rangefinders, GPS use, mapping skills, methodologies, vegetation identification, and ground cover estimation. Recordings of the songs and calls of grassland birds were provided to each technician for sharpening skill after the three-day training period.

Data Analysis:

Program DISTANCE (Thomas 1998-99) was used to analyze the point count data. The notation, concepts, and analysis methods of DISTANCE were developed by Buckland et al. (1993). Density estimates (D) were calculated for species that had a minimum of 25 observations or had a coefficient of variation (CV) of less than 50%, a level which indicates robust data. No flyover detections were used in the DISTANCE analysis (except for swallows). During analyses, DISTANCE assigns a unique detection function to avoid some potential problems associated with traditional analysis of point counts (e.g., varying detectability among habitats, species, and different years). Analysis using DISTANCE assumes that 1) all birds at distance 0 are detected; 2) distances of the birds close to the points or line are measured accurately; and, 3) birds do not move in response to the observer's presence. In this analysis, we adjusted the sampling effort to 0.5 because birds were recorded in only 180˚of the point count circle, instead of 360˚.

The index of relative abundance used in the distribution maps (Appendix A) was calculated from data collected using the road-based point count technique. The index of abundance, represented

by graded map symbols, was defined as the total number of individuals for each species detected on the section divided by the number of point counts conducted on that section (Appendix A).

Bird taxonomy and nomenclature in this report follow that of the American Ornithological Union (1998, 2002).

RESULTS

We surveyed 264 sections collectively on Grand River, Comanche, Kiowa, and Rita Blanca National Grasslands, detecting a total of 72 bird species (Appendix B). Presence and absence of these species on each National Grassland is reported in Appendix B.

Nineteen species had a sufficient number of observations to estimate density across all 4 National Grasslands (Table 1). Four species had a sufficient number of observations on each Grassland to allow a comparison of density among National Grasslands; Western Meadowlark, Horned Lark, Cassin's Sparrow and Lark Bunting (Figure 3). Species densities are also reported by individual Grassland (Tables 2 – 5).

Table 1. Density estimates for bird species observed May 16 – July 3, 2003 on all 4 National Grasslands.

Species	D	D LCL	D UCL	D CV	n
Swainson's Hawk	0.732	0.332	1.617	41%	15
Long-billed Curlew	0.50	0.24	1.04	38%	16
Mourning Dove	34.94	25.46	47.95	16%	156
Burrowing Owl	0.69	0.28	1.66	47%	18
Western Kingbird	21.63	14.33	32.64	21%	51
Eastern Kingbird	9.02	3.83	21.23	45%	13
Horned Lark	183.83	155.96	216.68	8%	621
Cliff Swallow	25.32	15.15	42.33	27%	56
Barn Swallow	11.80	6.06	22.99	35%	34
Northern Mockingbird	4.37	2.48	7.70	29%	32
Cassin's Sparrow	35.92	29.20	44.19	11%	344
Lark Sparrow	42.37	29.53	60.79	19%	109
Lark Bunting	34.56	23.95	49.88	19%	143
Grasshopper Sparrow	25.27	19.75	32.32	13%	102
Chestnut-collared Longspur	9.80	7.23	13.28	16%	143
Bobolink	0.98	0.49	1.98	37%	21
Red-winged Blackbird	5.16	2.99	8.89	28%	36
Western Meadowlark	66.71	59.75	74.48	6%	947
Brown-headed Cowbird	15.62	8.53	28.58	31%	45

D = Density estimate expressed in birds/km^2, DLCL & DUCL = lower and upper 95% confidence limits of D, DCV = coefficient of variation of D, n = number of detections used to calculate D.

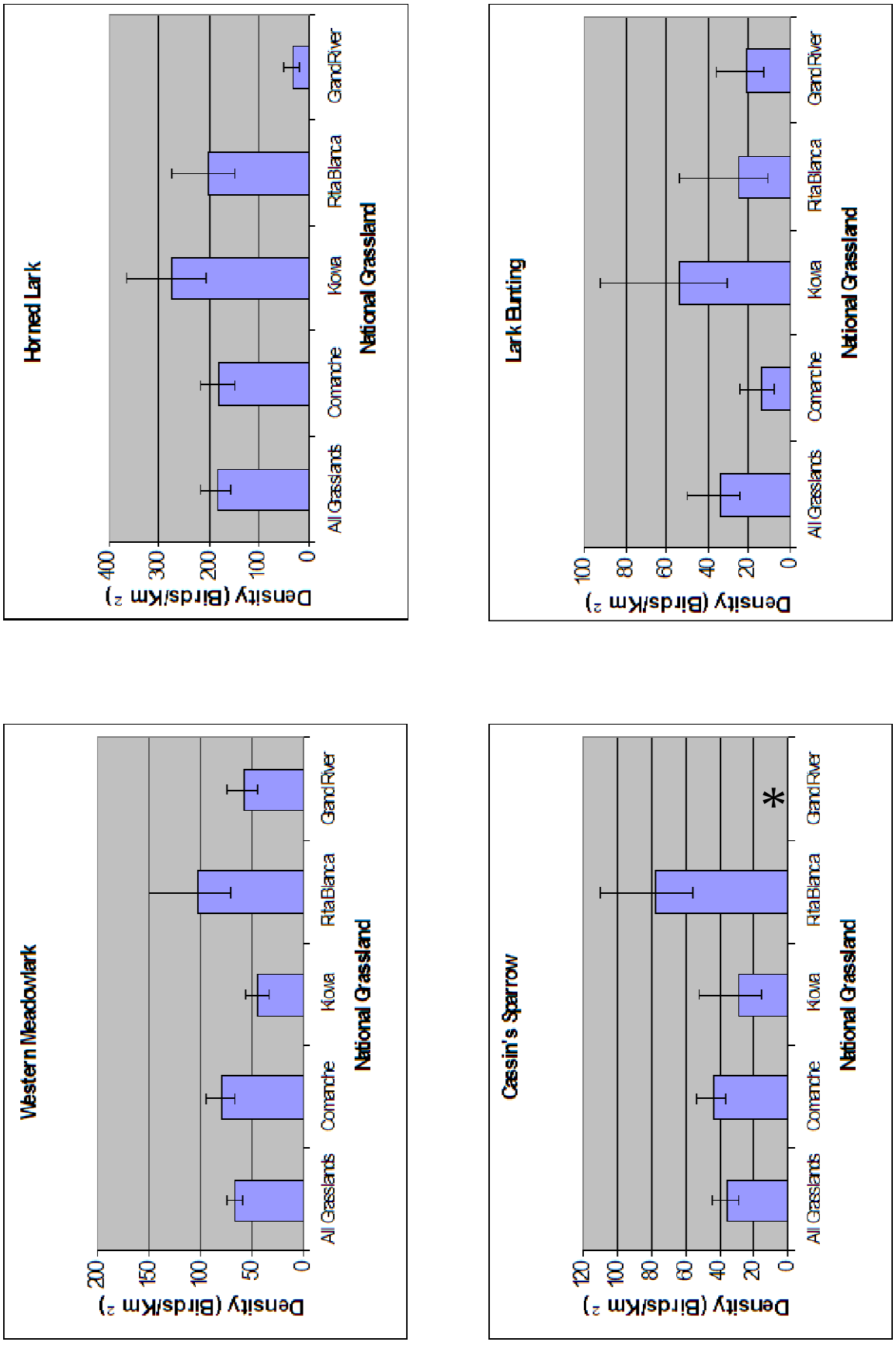

Figure 3. Density of Western Meadowlark, Horned Lark, Cassin's Sparrow, and Lark Bunting by National Grassland. Asterisk (*) indicates an insufficient number of detections for density analysis in program DISTANCE.

Grand River National Grassland:

We conducted 126 point counts on 42 sections on Grand River National Grassland, detecting a total of 52 species. We calculated density estimates for 11 of these species (Table 2).

Table 2: Density estimates for bird species observed May 16 – July 3, 2003 on Grand River National Grassland.

Species	D	D LCL	D UCL	D CV	n
Upland Sandpiper	8.09	3.30	19.87	47%	21
Eastern Kingbird	57.53	24.19	136.81	45%	20
Horned Lark	31.60	20.21	49.43	23%	50
Cliff Swallow	31.94	17.48	58.36	31%	40
Lark Bunting	21.44	12.81	35.86	27%	54
Grasshopper Sparrow	193.56	146.79	255.24	14%	103
Chestnut-collared Longspur	75.55	57.74	98.86	14%	158
Bobolink	13.14	6.45	26.80	37%	20
Red-winged Blackbird	29.52	15.74	55.37	33%	30
Western Meadowlark	56.86	43.63	74.09	14%	274
Brown-headed Cowbird	93.13	44.43	195.20	39%	55

D = Density estimate expressed in birds/km^2, DLCL & DUCL = lower and upper 95% confidence limits of D, DCV = coefficient of variation of D, n = number of detections used to calculate D.

Comanche National Grassland:

We conducted 399 point counts on 133 sections on Comanche National Grassland, detecting a total of 36 species. We calculated density estimates for 8 of these species (Table 3).

Table 3: Density estimates for bird species observed May 16 – July 3, 2003 on Comanche National Grassland.

Species	D	D LCL	D UCL	D CV	n
Mourning Dove	45.65	31.93	65.28	18%	98
Western Kingbird	33.19	18.15	60.69	31%	31
Horned Lark	179.45	149.27	215.73	9%	216
Northern Mockingbird	6.11	2.84	13.14	39%	23
Cassin's Sparrow	43.87	36.40	52.88	10%	149
Lark Sparrow	58.61	38.51	89.19	22%	72
Lark Bunting	13.57	7.65	24.07	30%	51
Western Meadowlark	79.46	66.21	95.37	9%	370

D = Density estimate expressed in birds/km^2, DLCL & DUCL = lower and upper 95% confidence limits of D, DCV = coefficient of variation of D, n = number of detections used to calculate D.

Kiowa National Grassland:

We conducted 174 point counts on 58 sections on Kiowa National Grassland, detecting a total of 35 species. Eight species had sufficient number of observations to estimate density (Table 4).

Table 4. Density estimates for bird species observed May 16 – July 3, 2003 on Kiowa National Grassland

Species	D	D LCL	D UCL	D CV	n
Mourning Dove	22.84	13.12	39.76	29%	28
Western Kingbird	25.33	12.93	49.64	35%	18
Horned Lark	275.31	206.24	367.51	15%	151
Cliff Swallow	68.13	32.68	142.07	39%	39
Cassin's Sparrow	28.37	15.28	52.68	32%	22
Lark Sparrow	45.47	23.34	88.60	35%	24
Lark Bunting	53.40	30.92	92.21	28%	38
Western Meadowlark	43.53	34.23	55.36	12%	134

D = Density estimate expressed in birds/km^2, DLCL & DUCL = lower and upper 95% confidence limits of D, DCV = coefficient of variation of D, n = number of detections used to calculate D.

Rita Blanca National Grassland:

We conducted 93 point counts on 31 sections on Rita Blanca National Grassland, detecting a total of 29 species. Four species had sufficient number of observations to estimate density (Table 5).

Table 5. Density estimates for bird species observed May 16 – July 3, 2003 on Rita Blanca National Grassland.

Species	D	D LCL	D UCL	D CV	n
Horned Lark	201.54	147.98	274.49	16%	138
Cassin's Sparrow	77.94	55.10	110.24	18%	149
Lark Bunting	24.64	11.35	53.48	41%	23
Western Meadowlark	102.66	70.17	150.18	20%	182

D = Density estimate expressed in birds/km^2, DLCL & DUCL = lower and upper 95% confidence limits of D, DCV = coefficient of variation of D, n = number of detections used to calculate D.

DISCUSSION AND RECOMMENDATIONS

In 2003, section-based monitoring on Grand River, Comanche, Kiowa, and Rita Blanca National Grasslands yielded density estimates for 19 of the 72 detected grassland bird species. These section-based surveys provide the data necessary to detect and monitor trends in species population and distribution within the Grasslands. Increasing the sample size on the currently surveyed Grasslands or surveying additional Grasslands will potentially increase the number of species monitored under this protocol and will yield more robust data.

Monitoring at a Grassland scale provides Grassland-specific data, resulting in more effective land management decisions regarding conservation of grassland birds and their habitat. For example, data collected through section-based monitoring can be used to link habitat types or management practices to bird counts. Permanently marked point count locations can be related to base vegetation using GIS layers or to management practices using Forest Service records. Correlations can then be drawn among avian trends, densities, diversity and management practices. Evaluating management practices based on population trends and distributions will enable us to focus conservation efforts and help land managers to make decisions that conserve prairie birds on National Grasslands.

Furthermore, data collected on National Grasslands contributes to the detection and monitoring of regional trends in species population and distribution. Section-based monitoring is currently being conducted across the shortgrass prairie bird conservation regions (BCR 18) of 5 Great Plains states -- Nebraska, Colorado, Kansas, New Mexico, and Oklahoma. We anticipate expanding section-based monitoring into Texas in the 2004 field season, and would then be surveying approximately 95% of the shortgrass prairie bird conservation region (BCR 18). Monitoring across BCR 18 allows for landscape scale bird conservation and facilitates cooperative working relationships between federal, state and local agencies and organizations.

A disadvantage of our section-based monitoring program, which is also shared by BBS, is the potential road bias resulting form the road-based surveying technique. This should not affect our ability to monitor bird populations into the future assuming there is no variation in the roadside bias among years. We are currently working toward generating a correction factor that would allow us to calculate more accurate density estimates. The road-based point counts are being compared to un-biased point transects to determine a variable for each species for which there are density estimates from both techniques. The correction factor will compensate for the density estimate generated, from road-based point counts, and should offer a more accurate population estimate for individual species.

Overall, section-based monitoring at a Grassland scale is inexpensive, defensible, site-specific, and habitat-specific. It fills an important management need at a modest cost. However, there should be no expectation that this technique will detect and develop trends for all grassland bird species. No single technique can accomplish such an assessment of all grassland birds. Section-based monitoring provides an overview of the avian community and can be used to identify areas in need of particular management attention, resulting in more effective conservation of Great Plains birds on National Grasslands.

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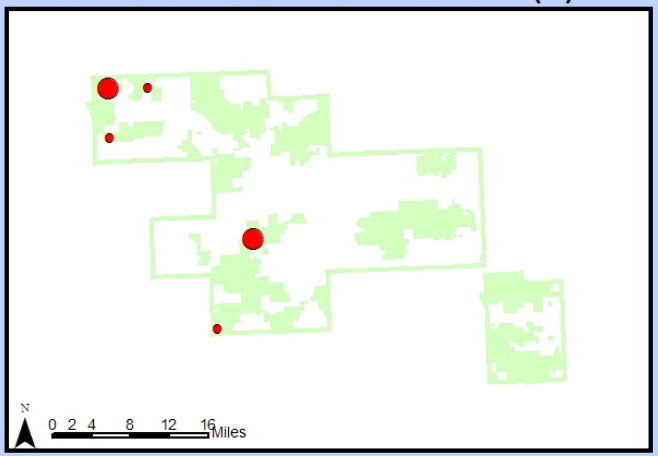
APPENDIX A

The following are species distribution maps that show observation locations and index of abundance at the section level. Index of abundance, represented by graded dots, is defined as the total number of a species detected on the section divided by the number of point counts conducted on that section. The index of abundance was created to adjust for the amount of effort on each of the sections among years (2001 - 2003) and states. In 2001, during section-based monitoring in Colorado and Nebraska, 1 to 4 point counts per section were conducted compared to 2002 and 2003 when 3 point counts were conducted on all sections.

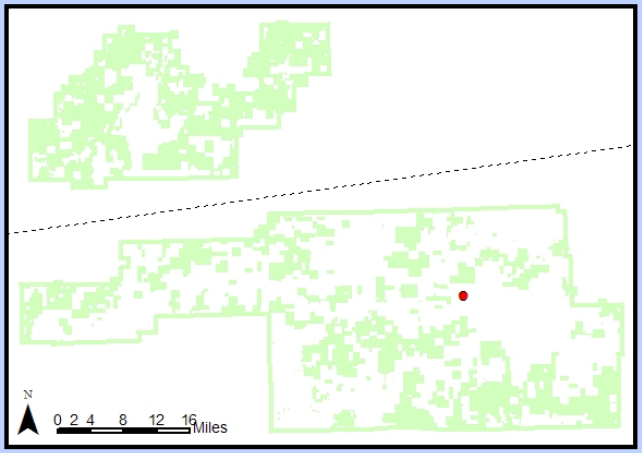
Northern Harrier

(Circus cyaneus)

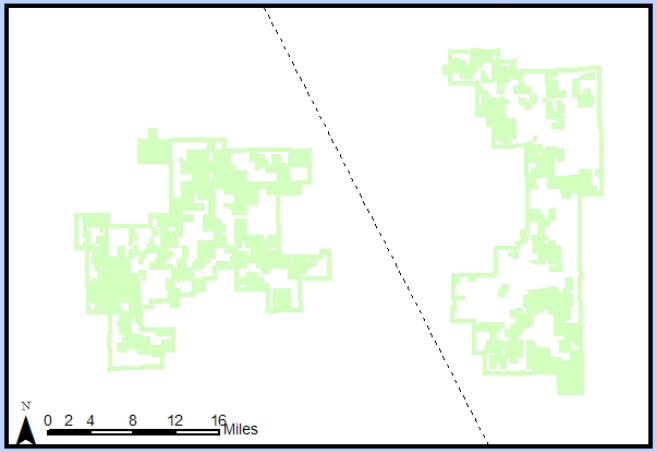
Grand River National Grassland (A)



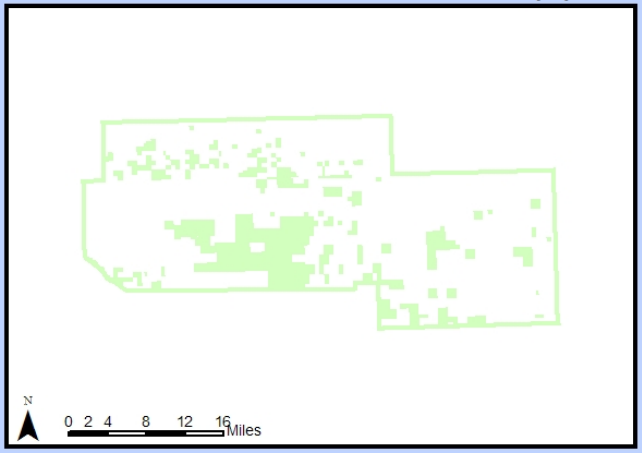
Comanche National Grassland (B)



Kiowa National Grassland (C)



Rita Blanca National Grassland (D)



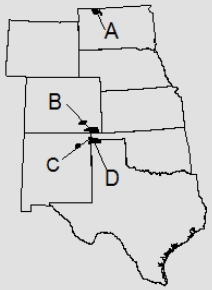
Legend

Index of Bird Abundance*

- 0.33 - 0.44
- 0.45 - 0.56
- 0.57 - 0.67

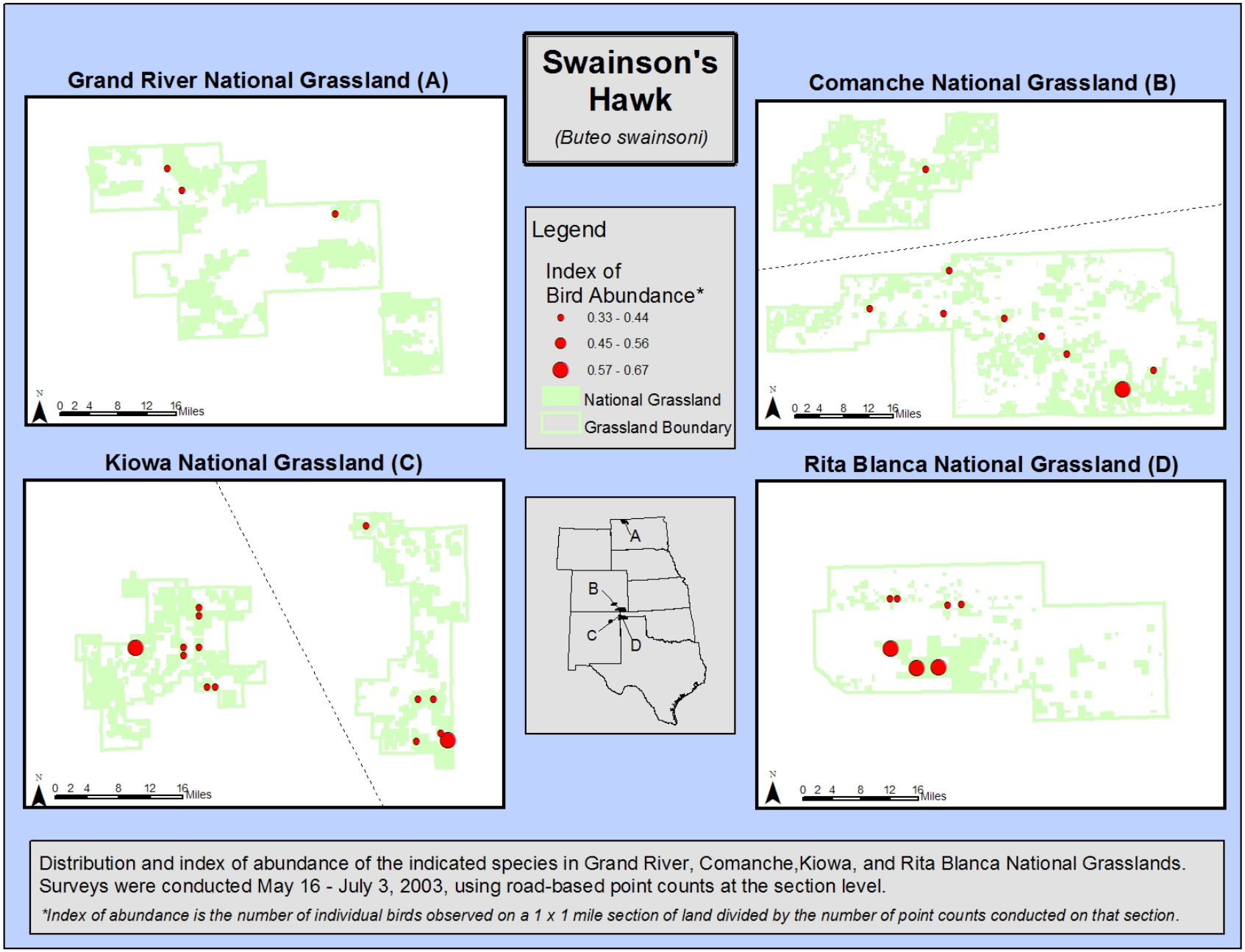
National Grassland

Grassland Boundary



Distribution and index of abundance of the indicated species in Grand River, Comanche,Kiowa, and Rita Blanca National Grasslands. Surveys were conducted May 16 - July 3, 2003, using road-based point counts at the section level.

**Index of abundance is the number of individual birds observed on a 1 x 1 mile section of land divided by the number of point counts conducted on that section.*



Distribution and index of abundance of the indicated species in Grand River, Comanche,Kiowa, and Rita Blanca National Grasslands. Surveys were conducted May 16 - July 3, 2003, using road-based point counts at the section level.

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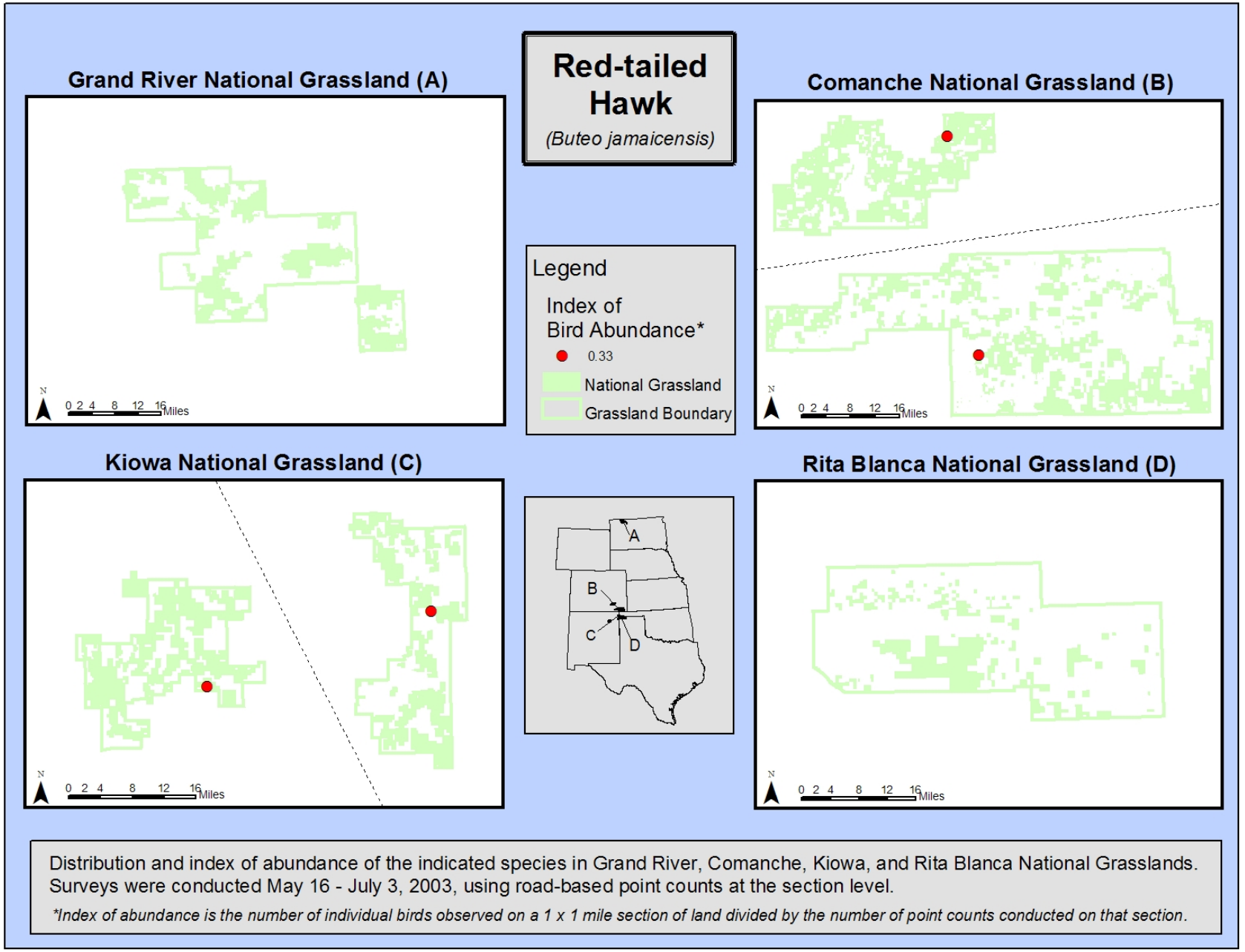

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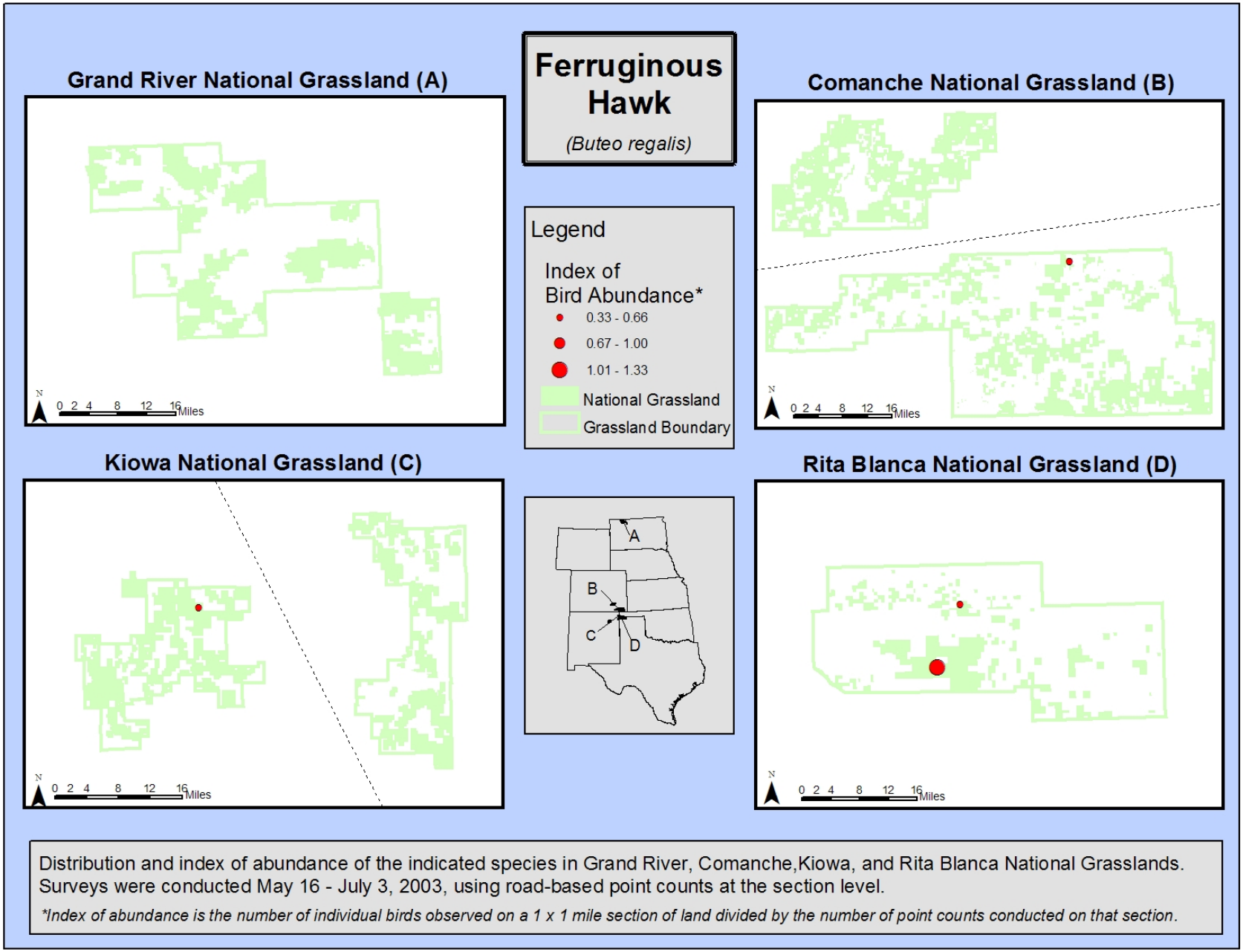

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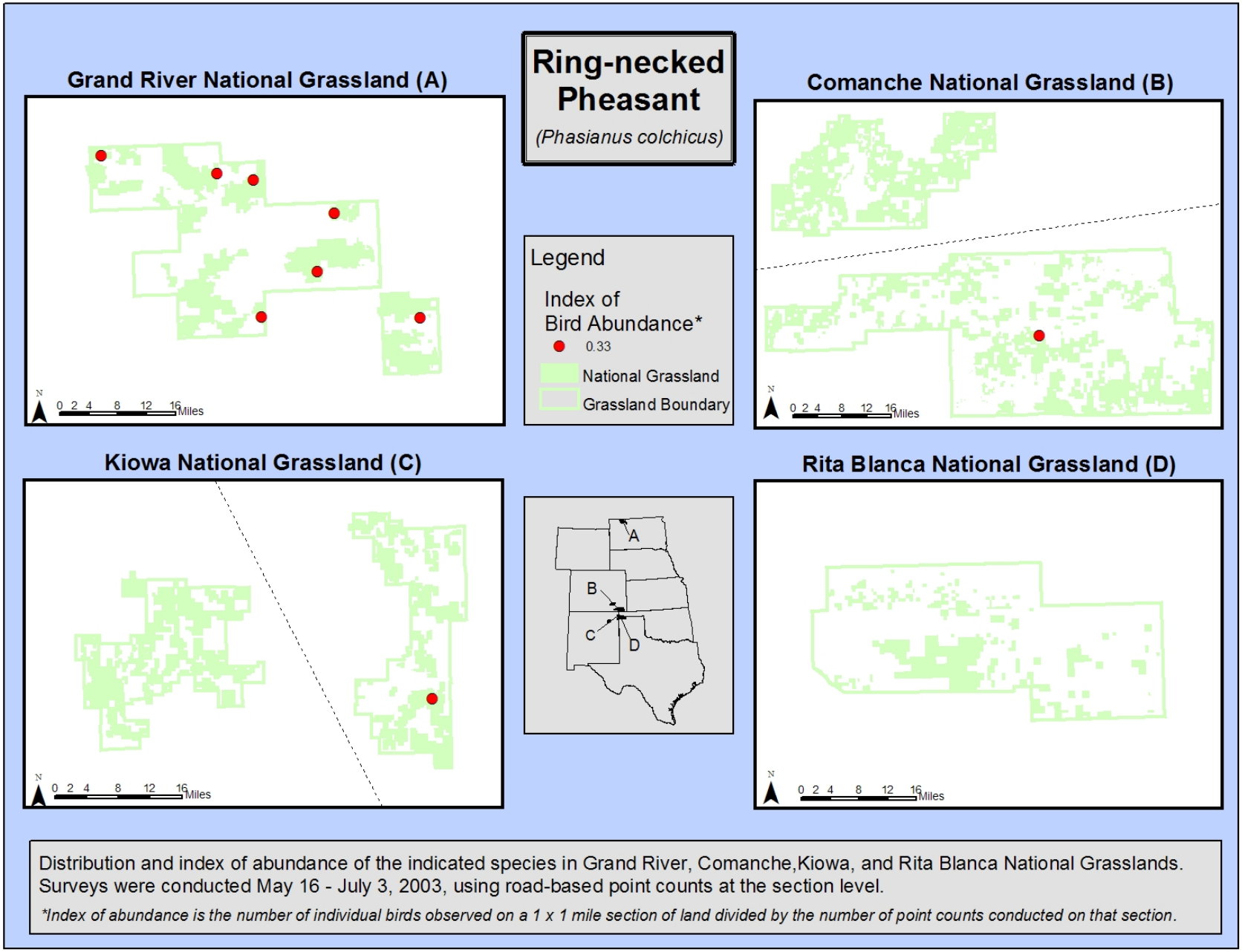

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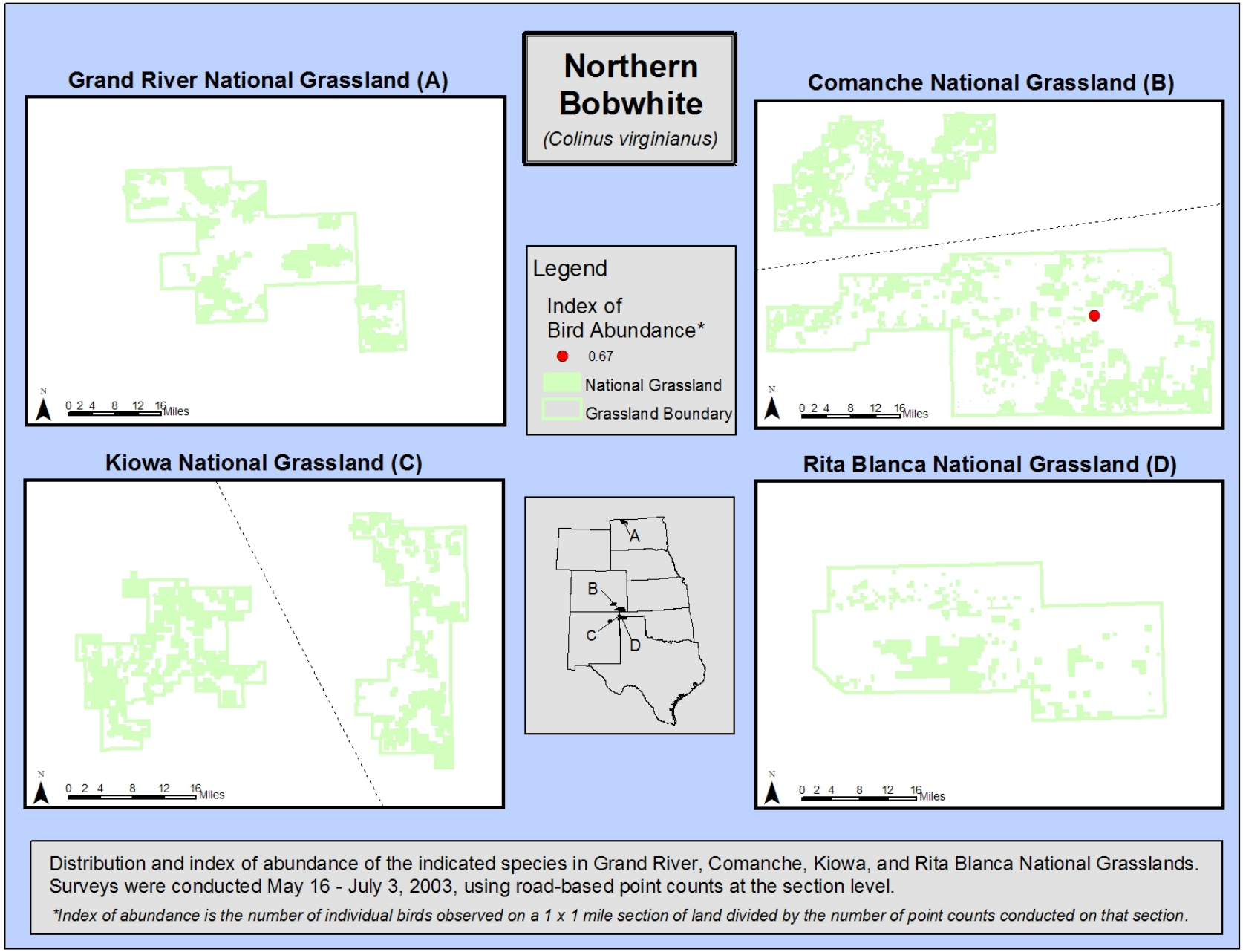

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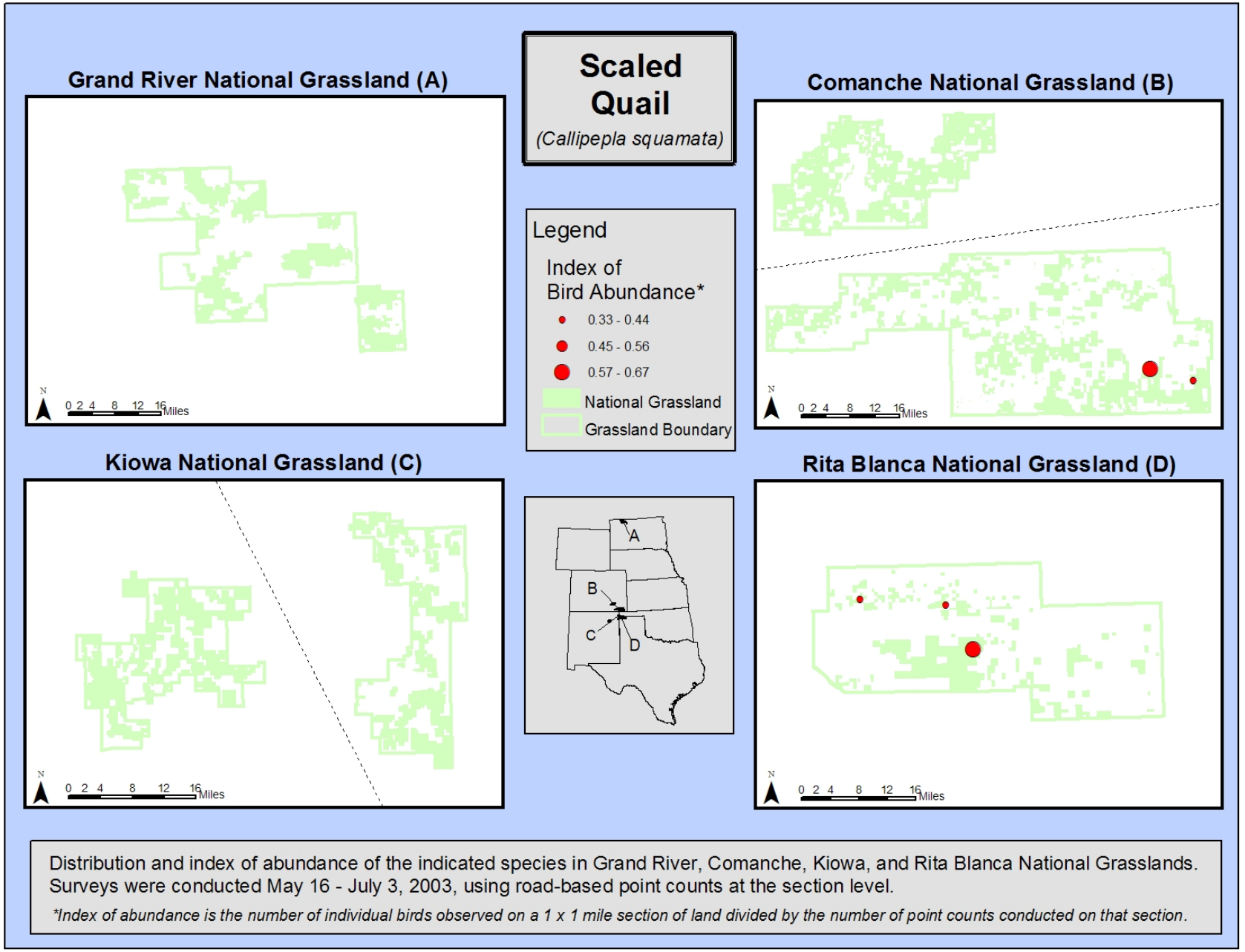

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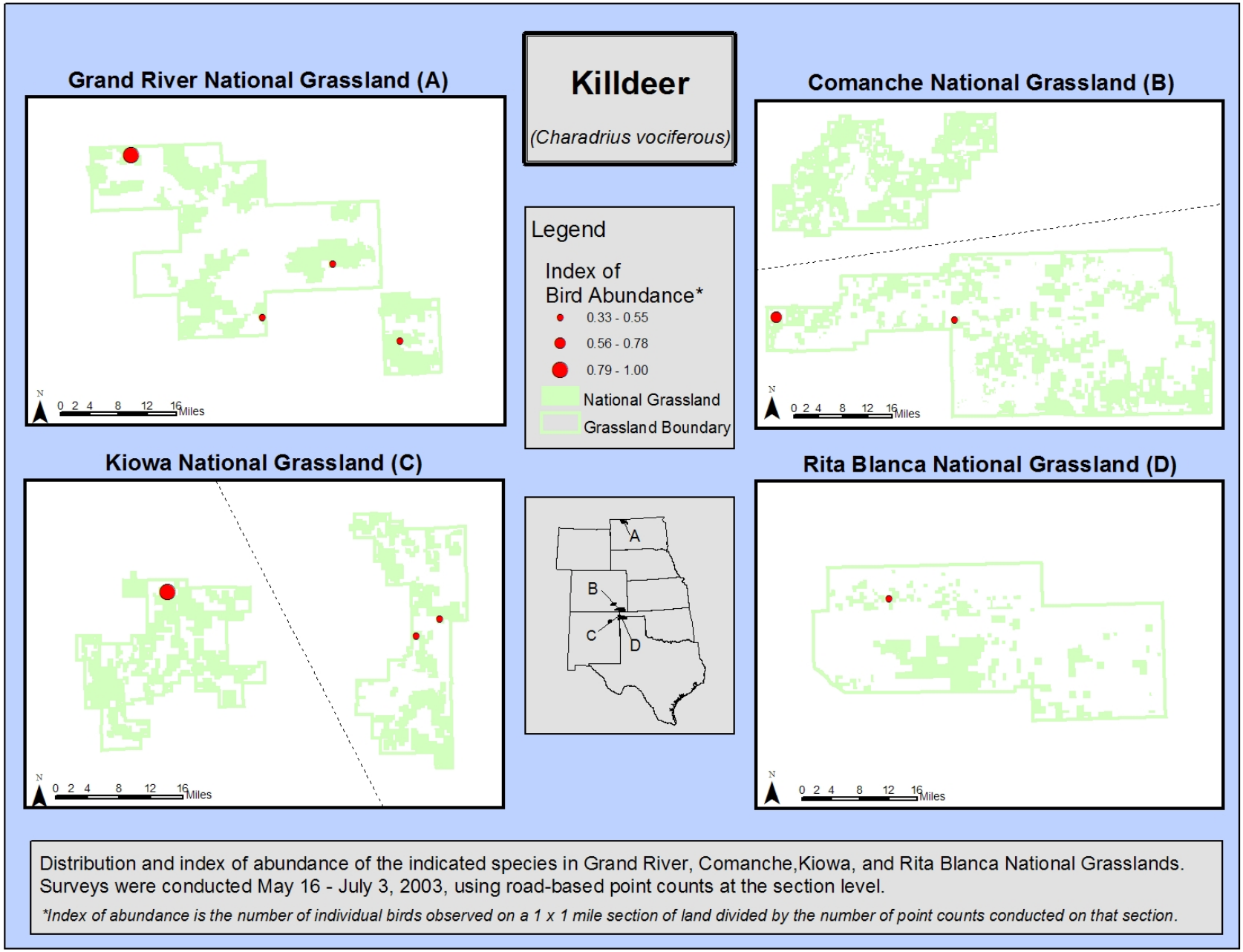

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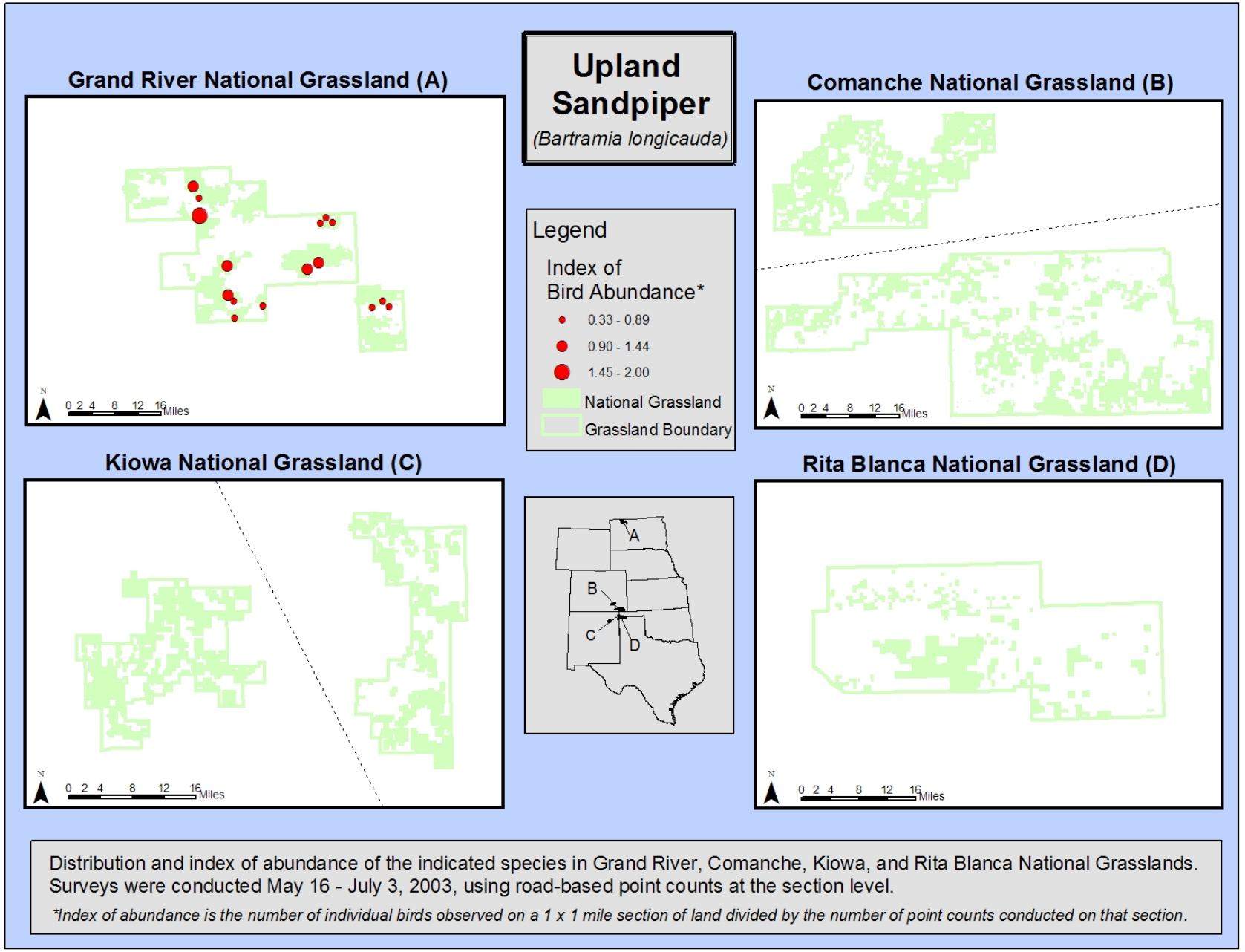

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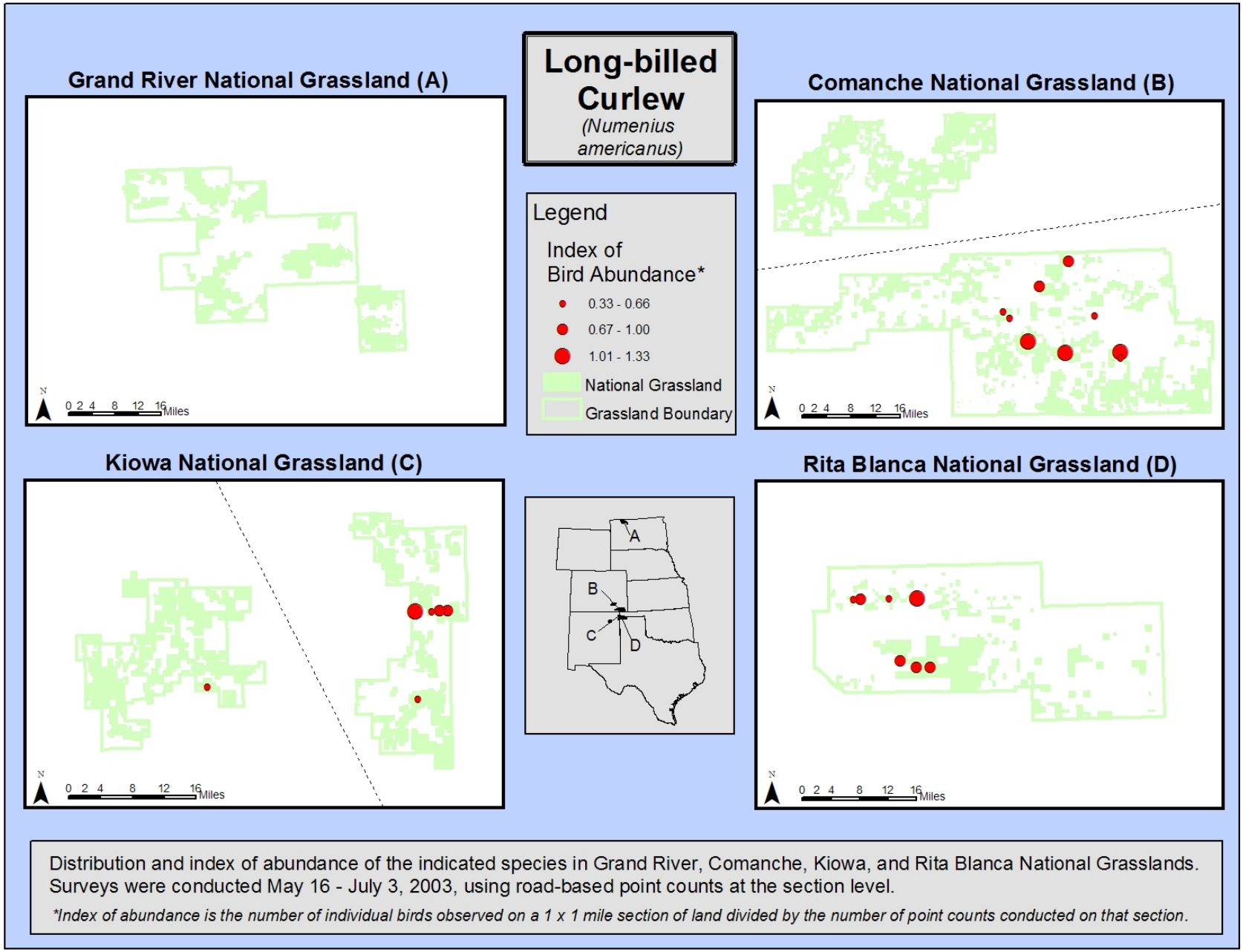

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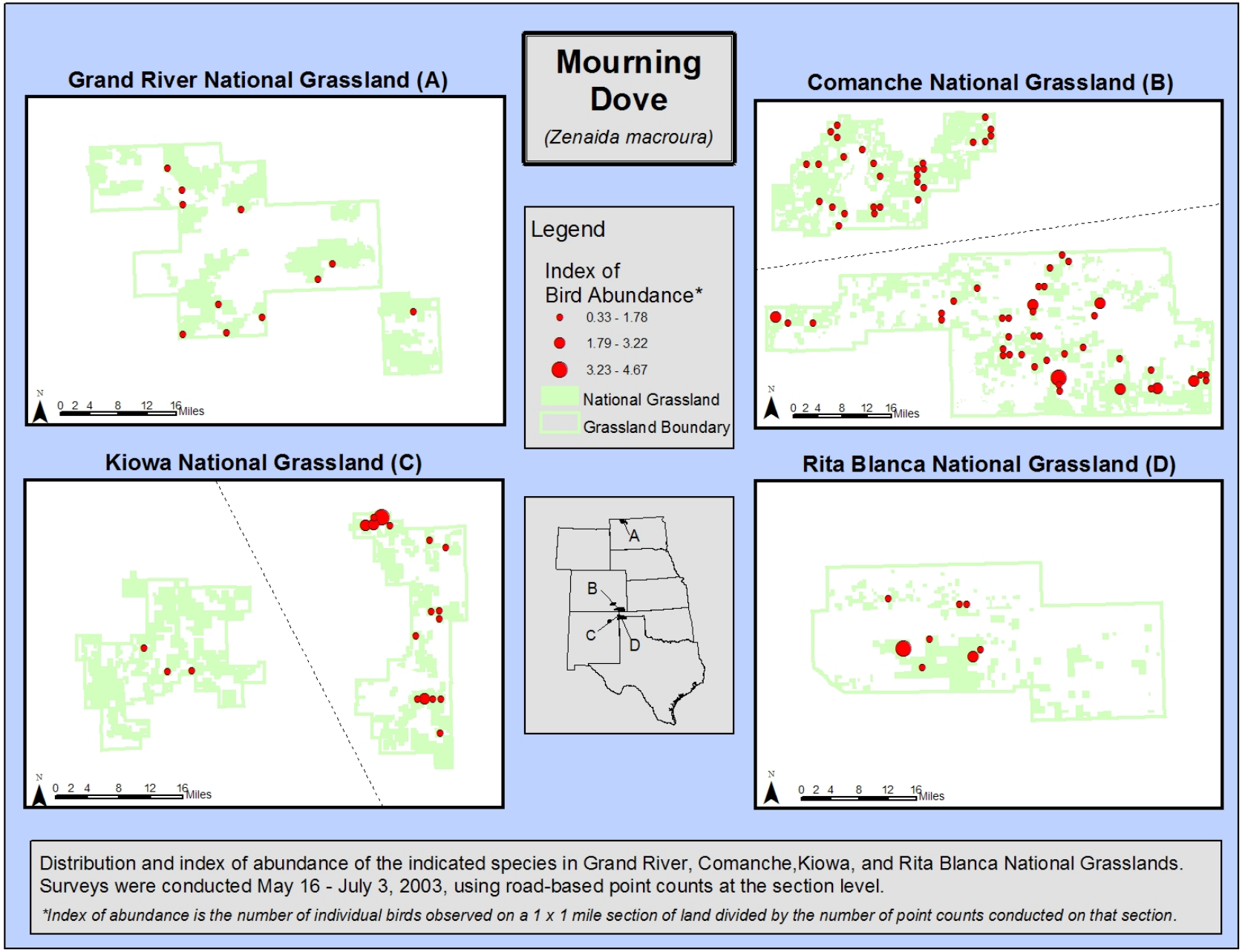

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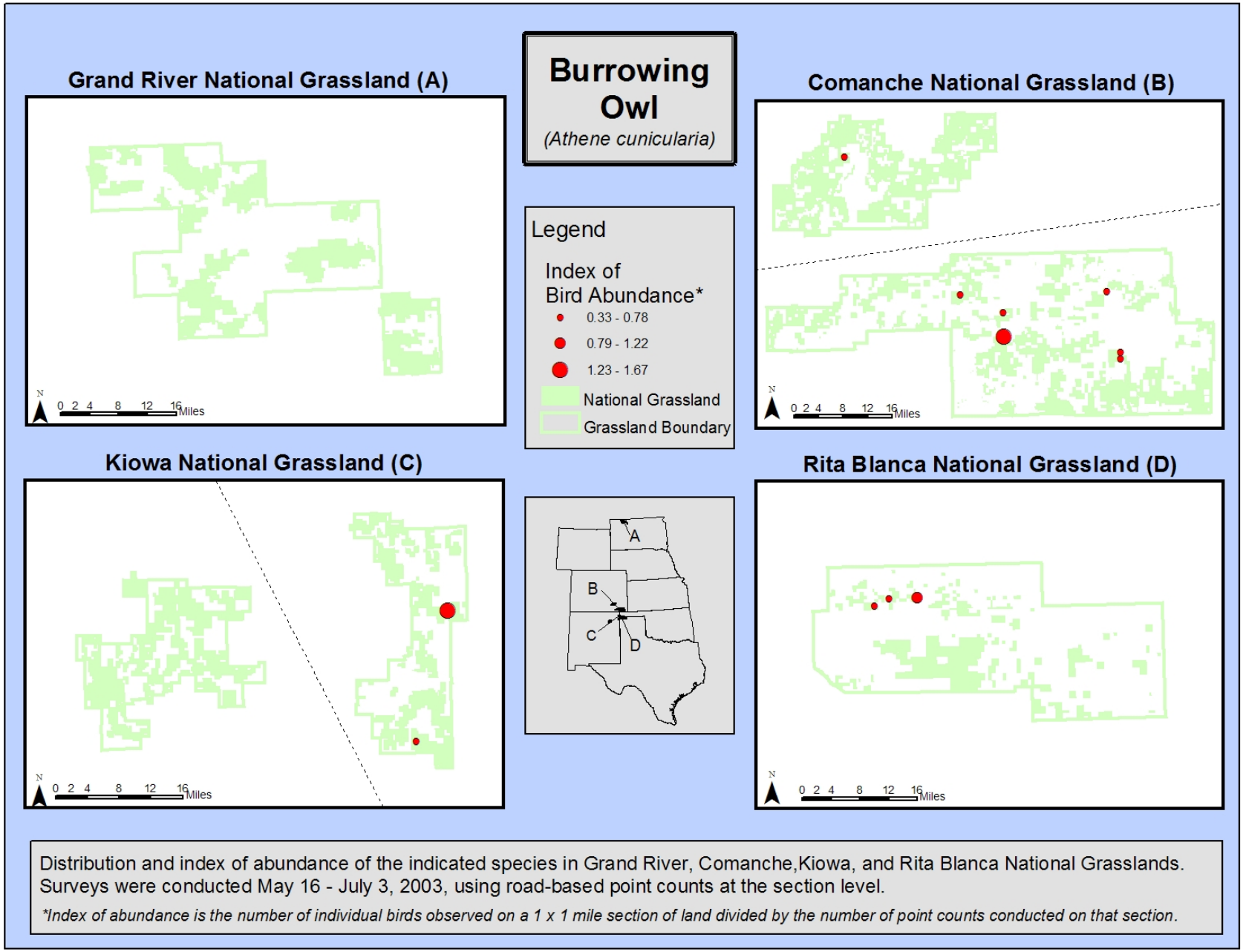

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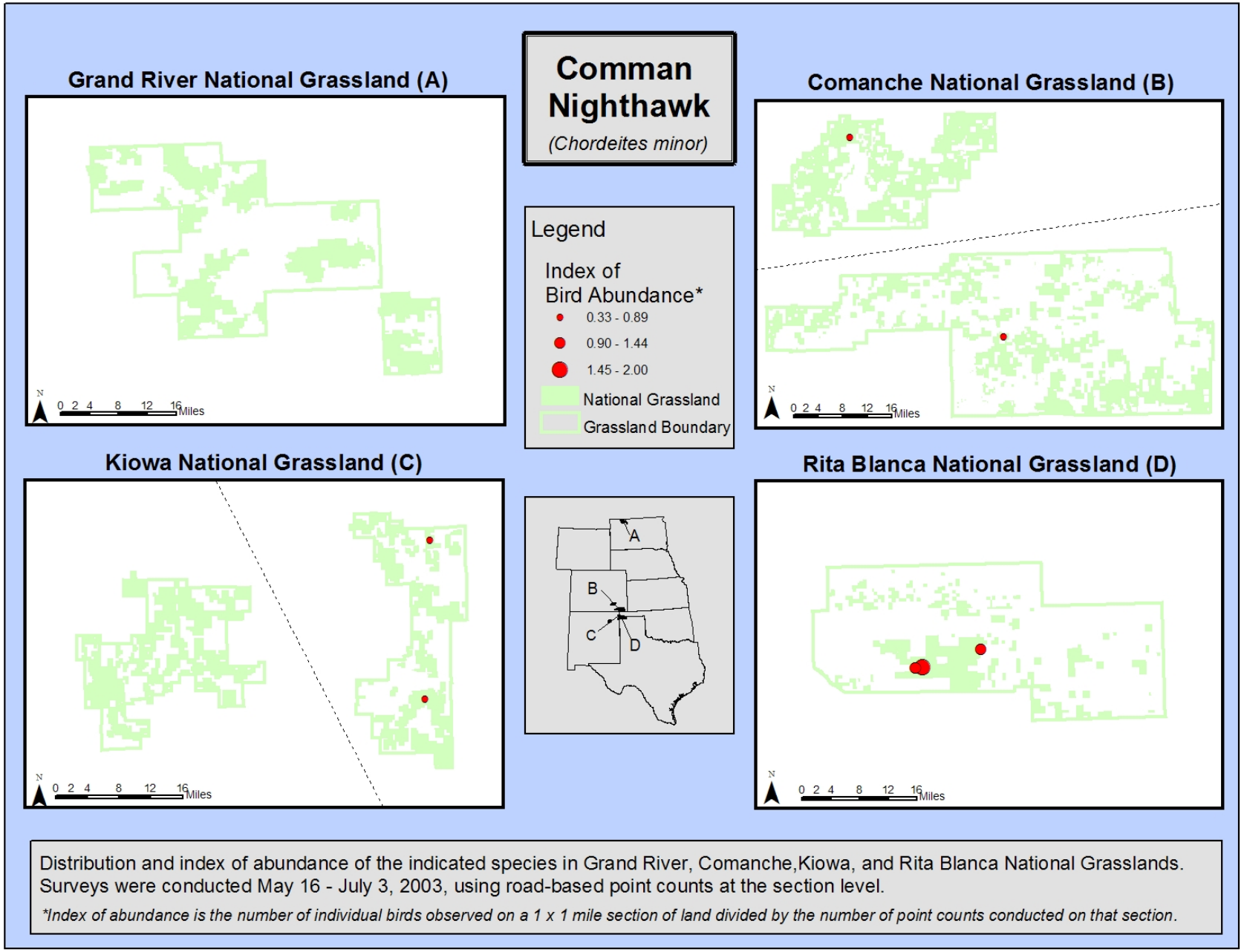

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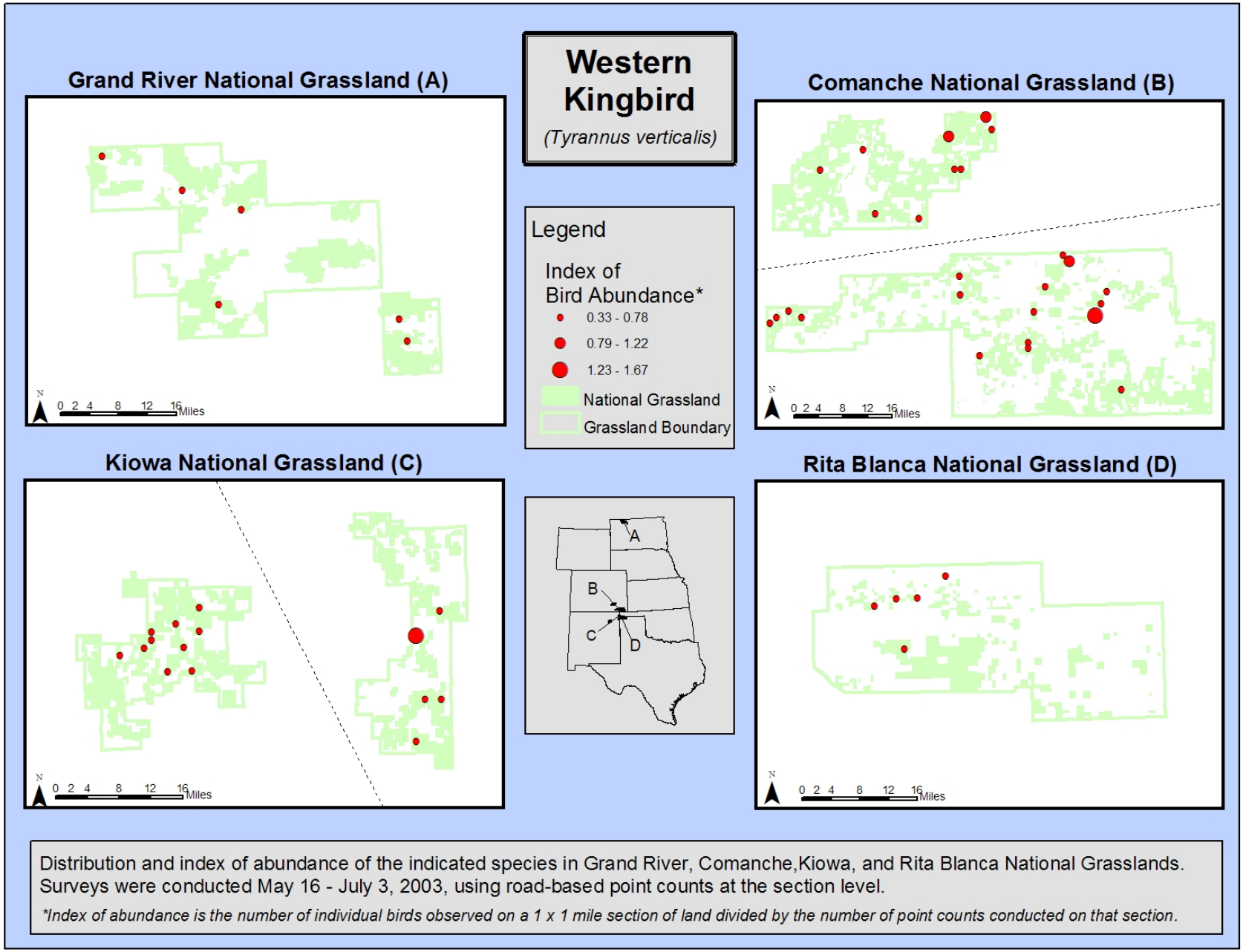

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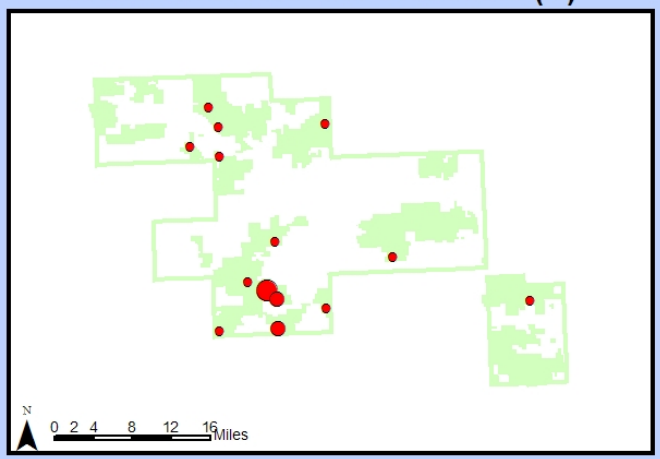
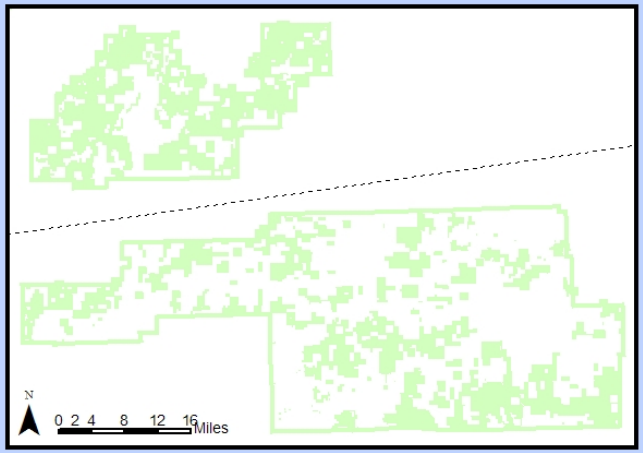
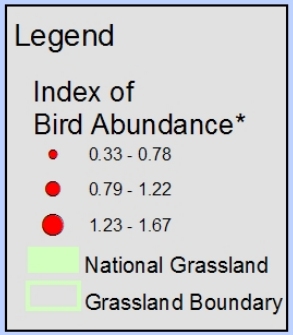
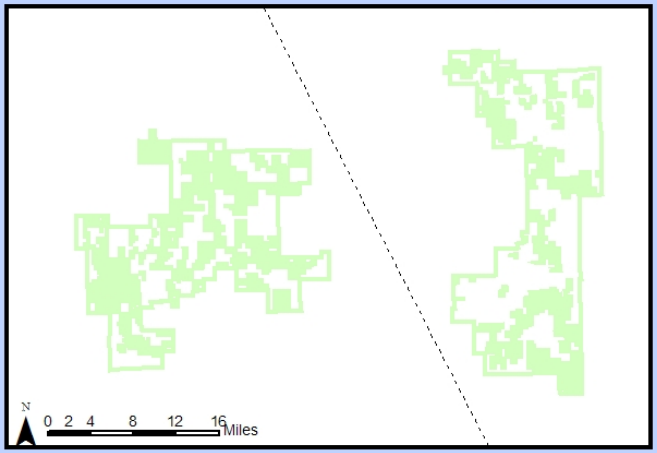
Eastern Kingbird

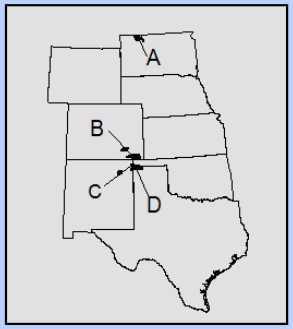
(Tyrannus tyrannus)

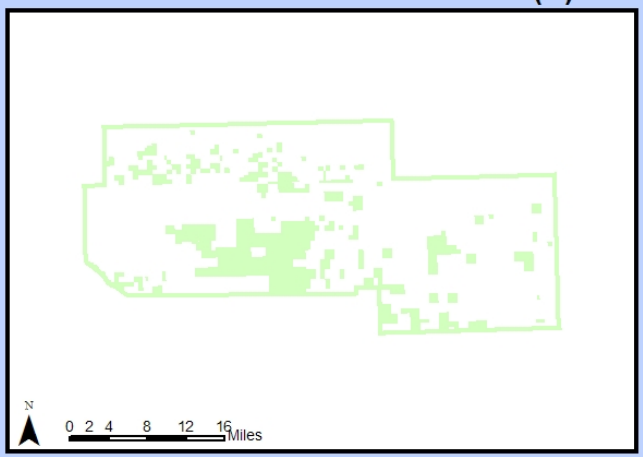












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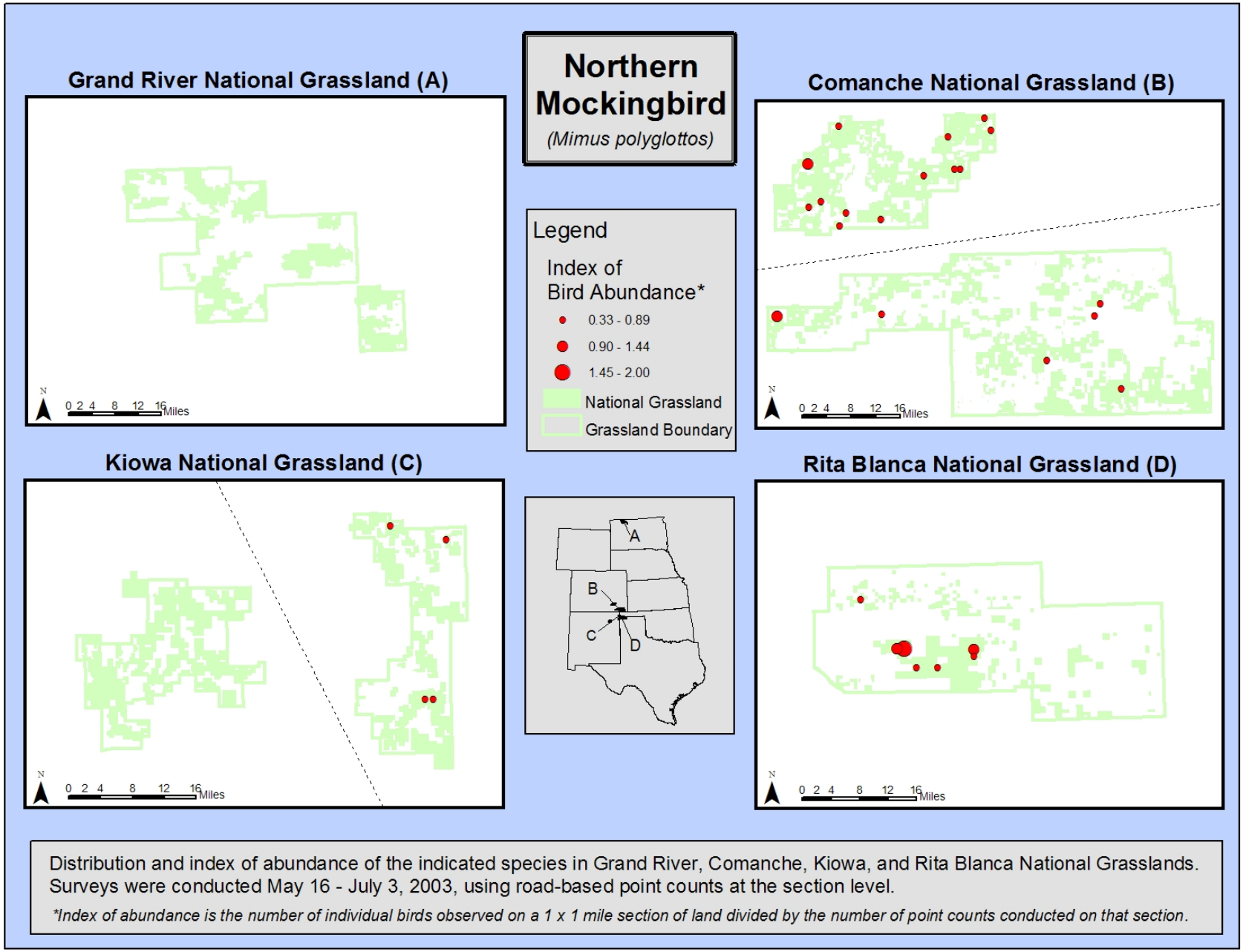

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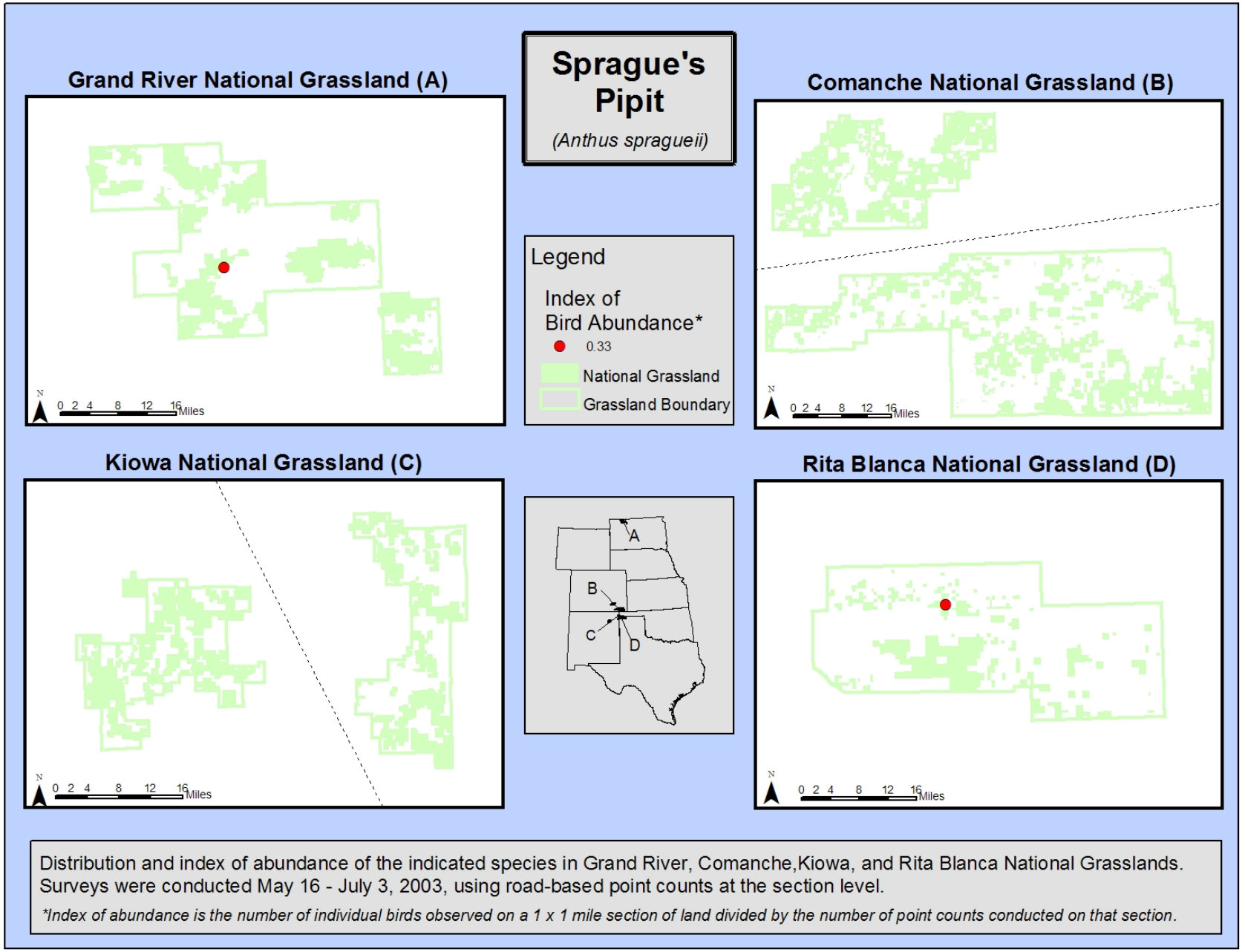

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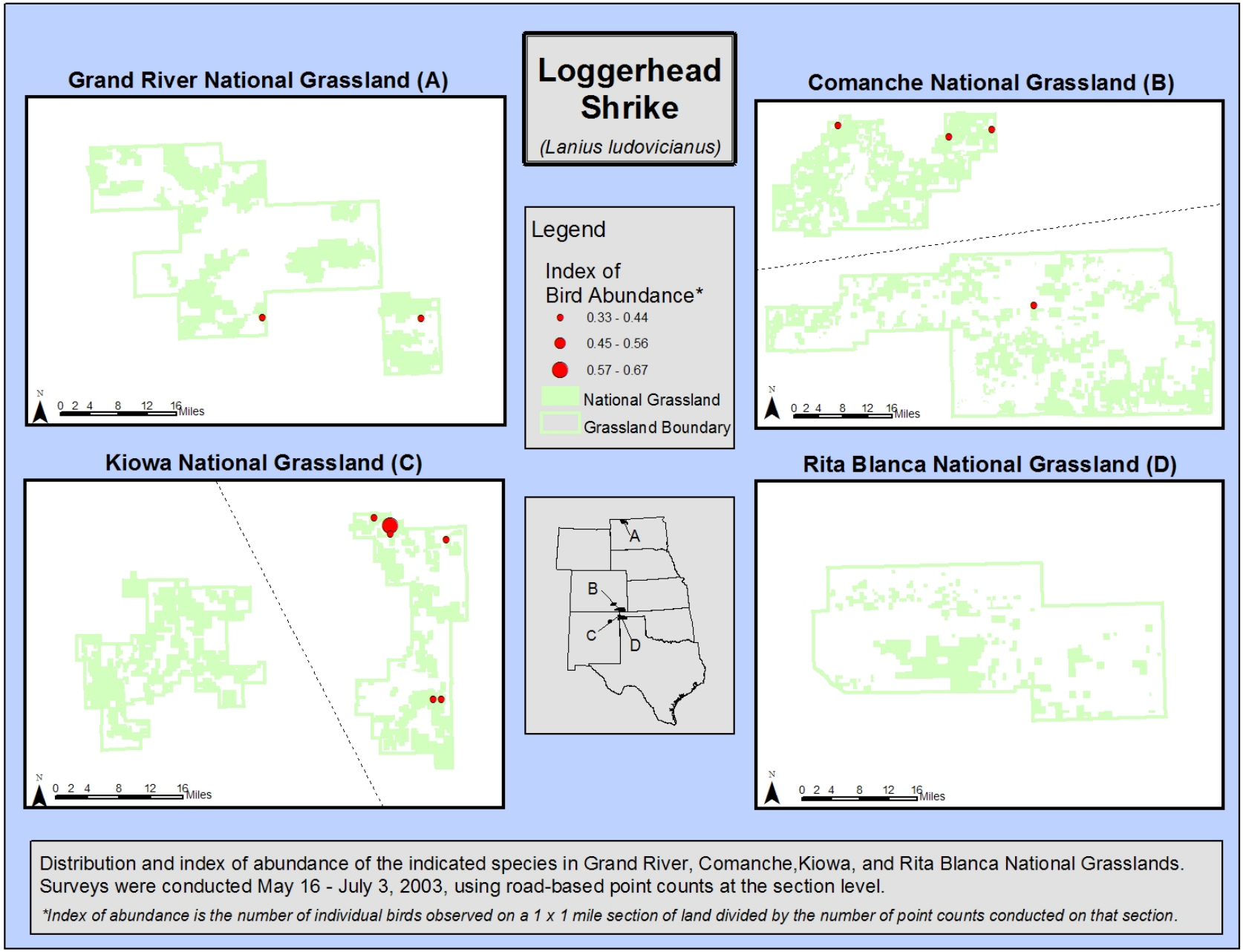

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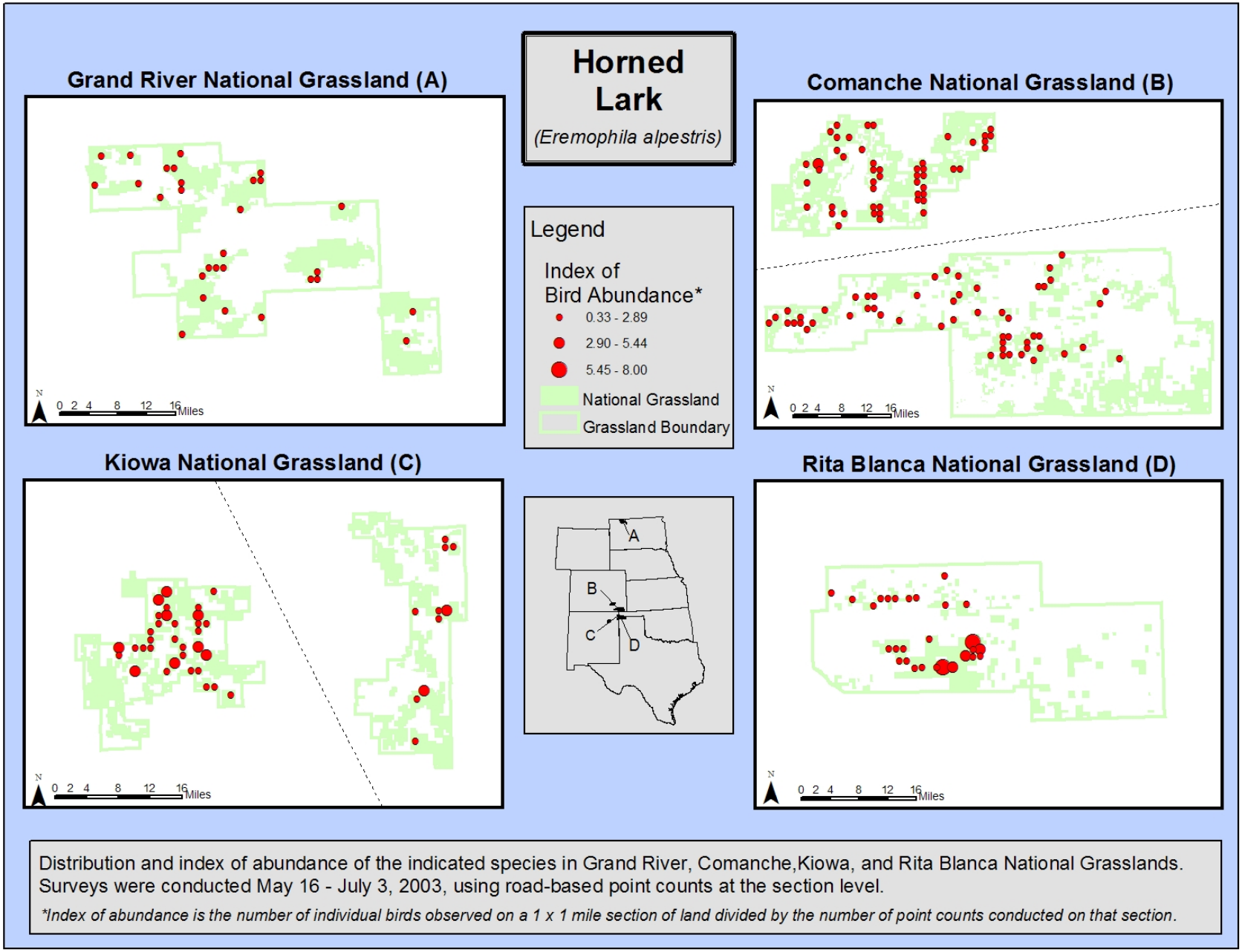

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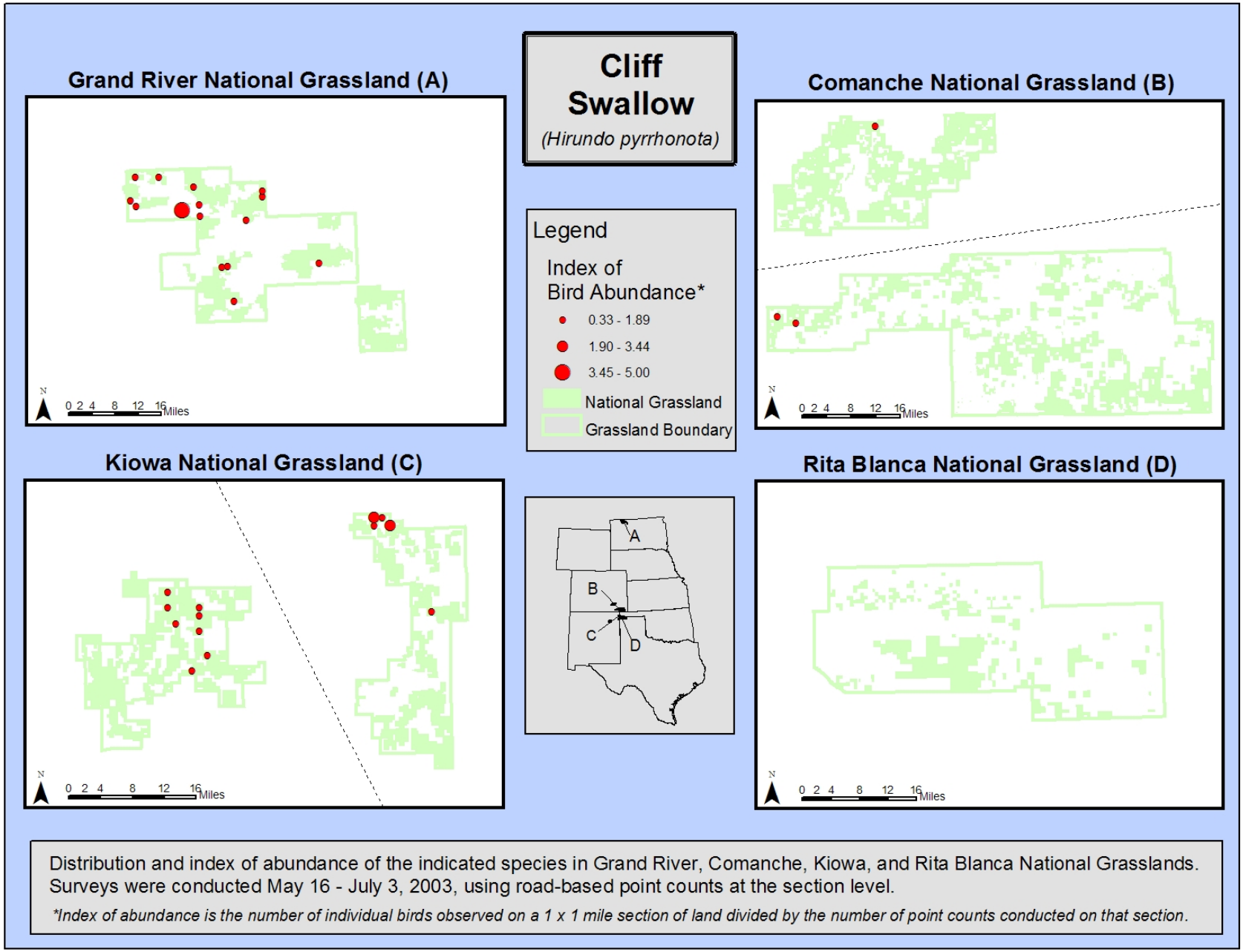

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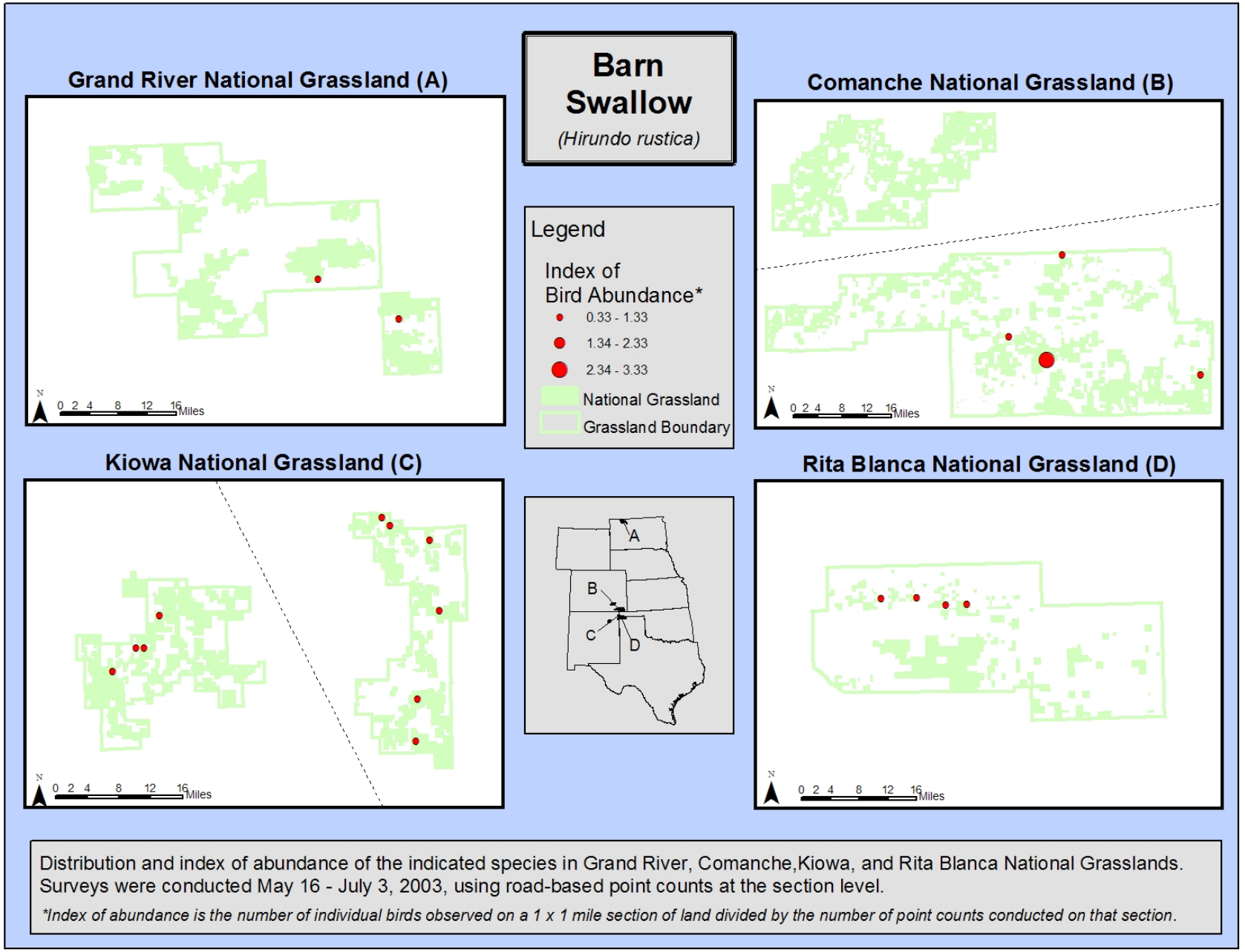

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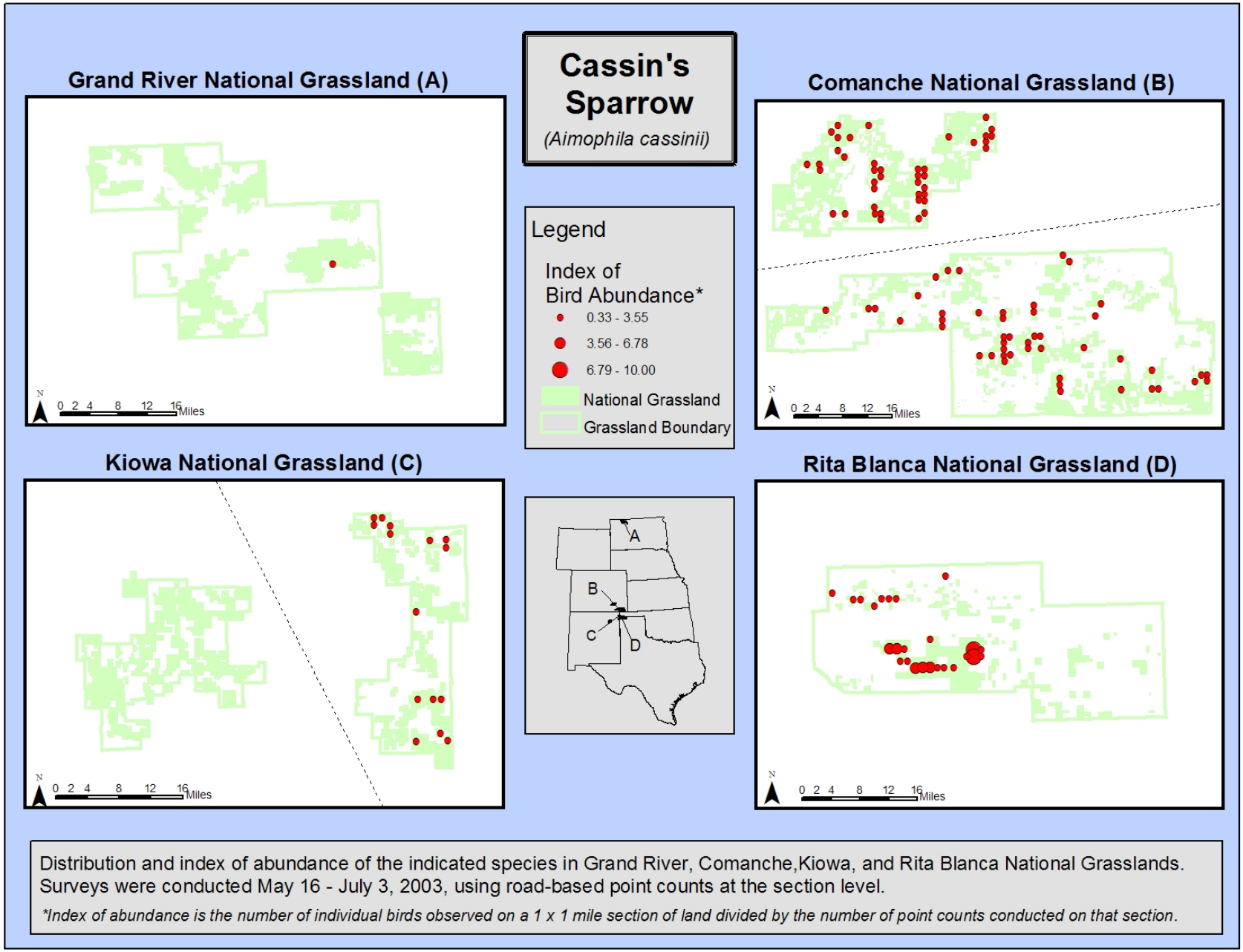

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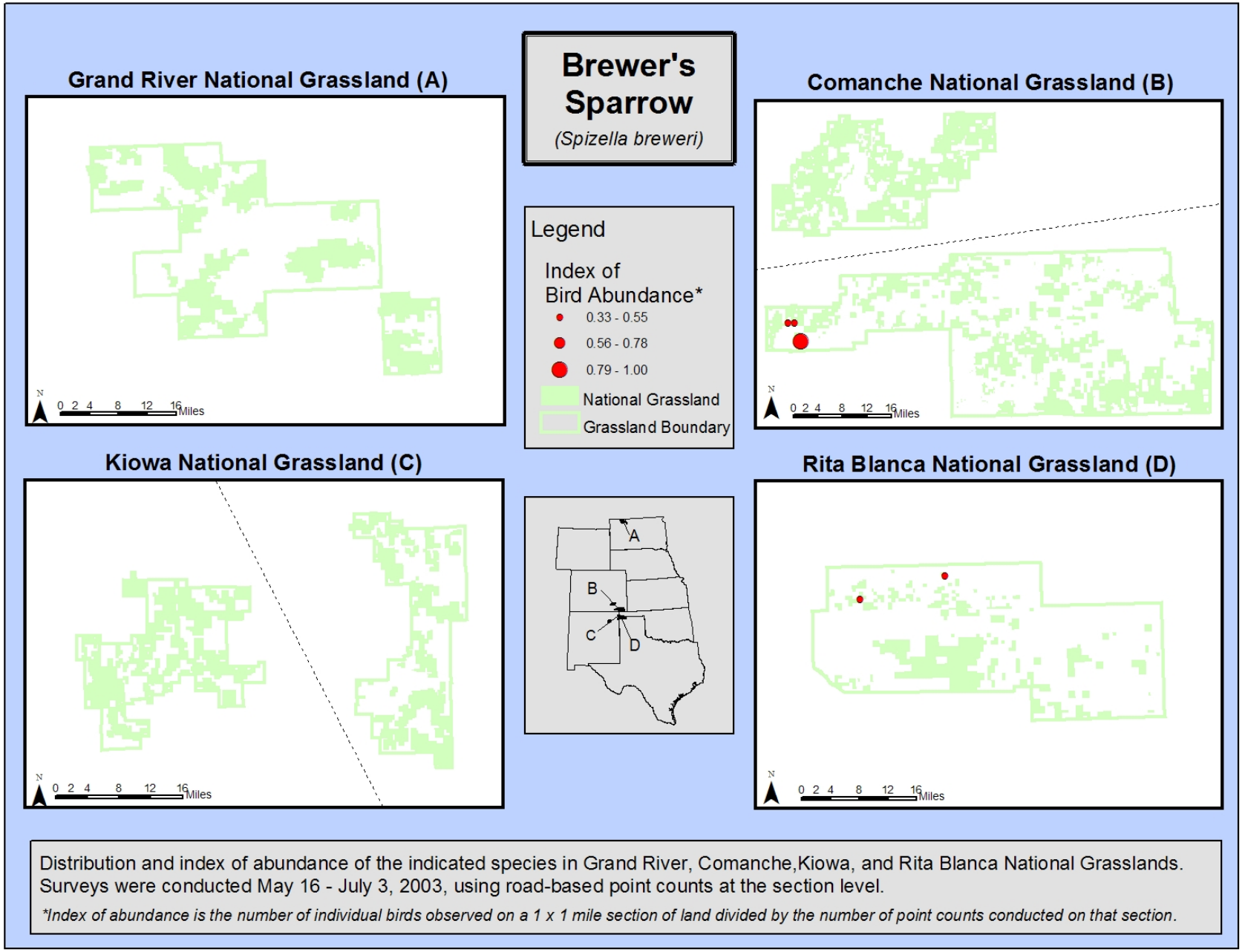

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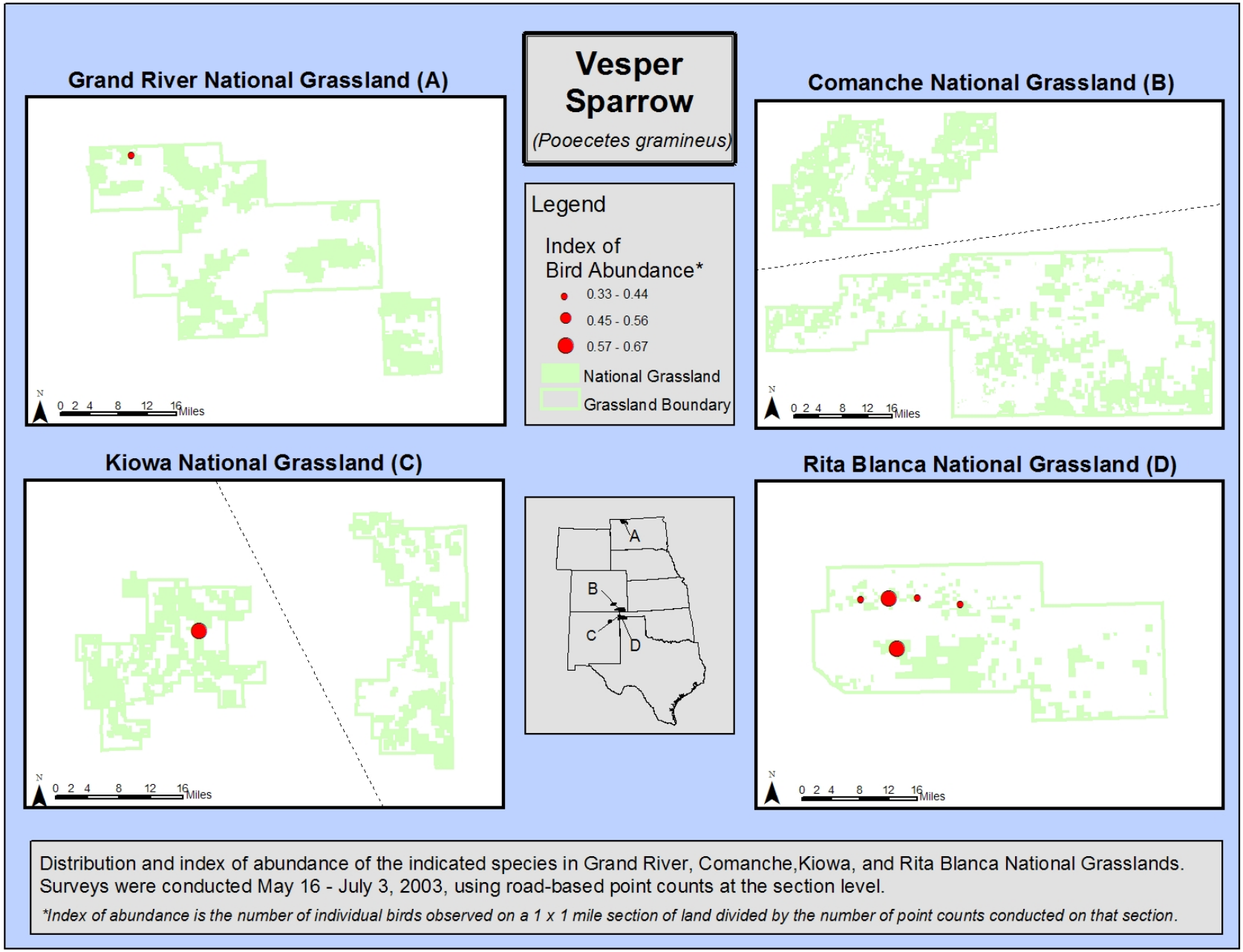

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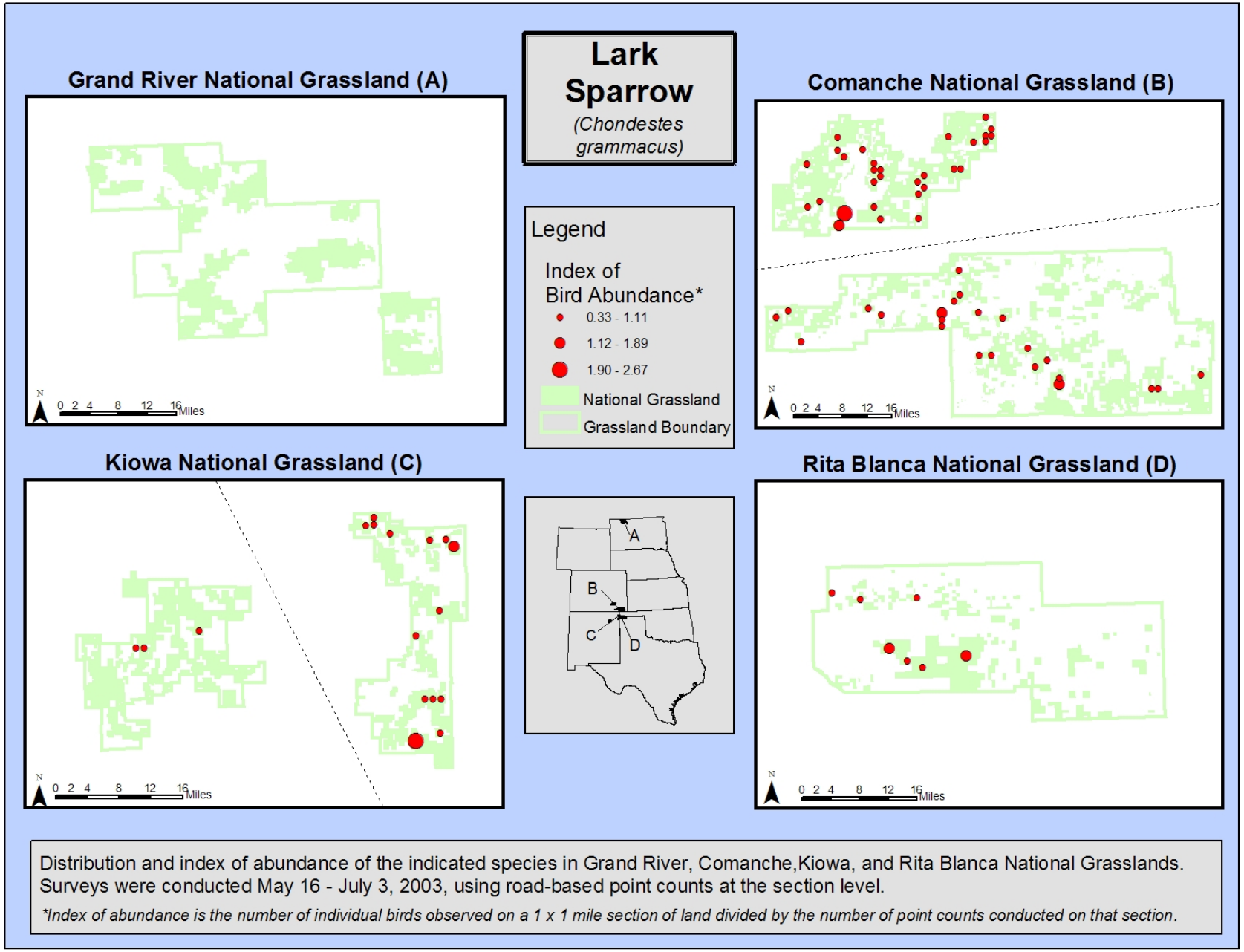

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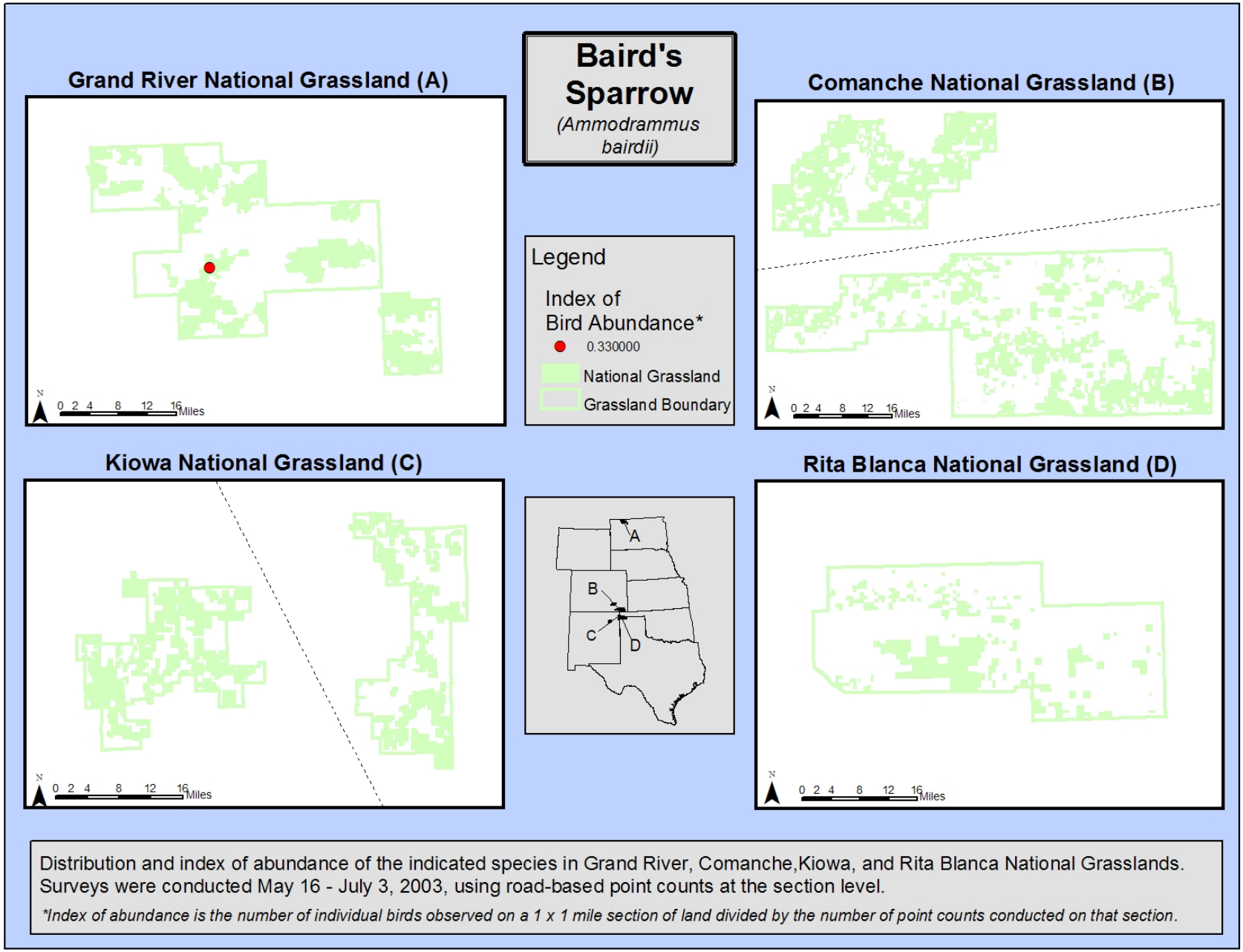

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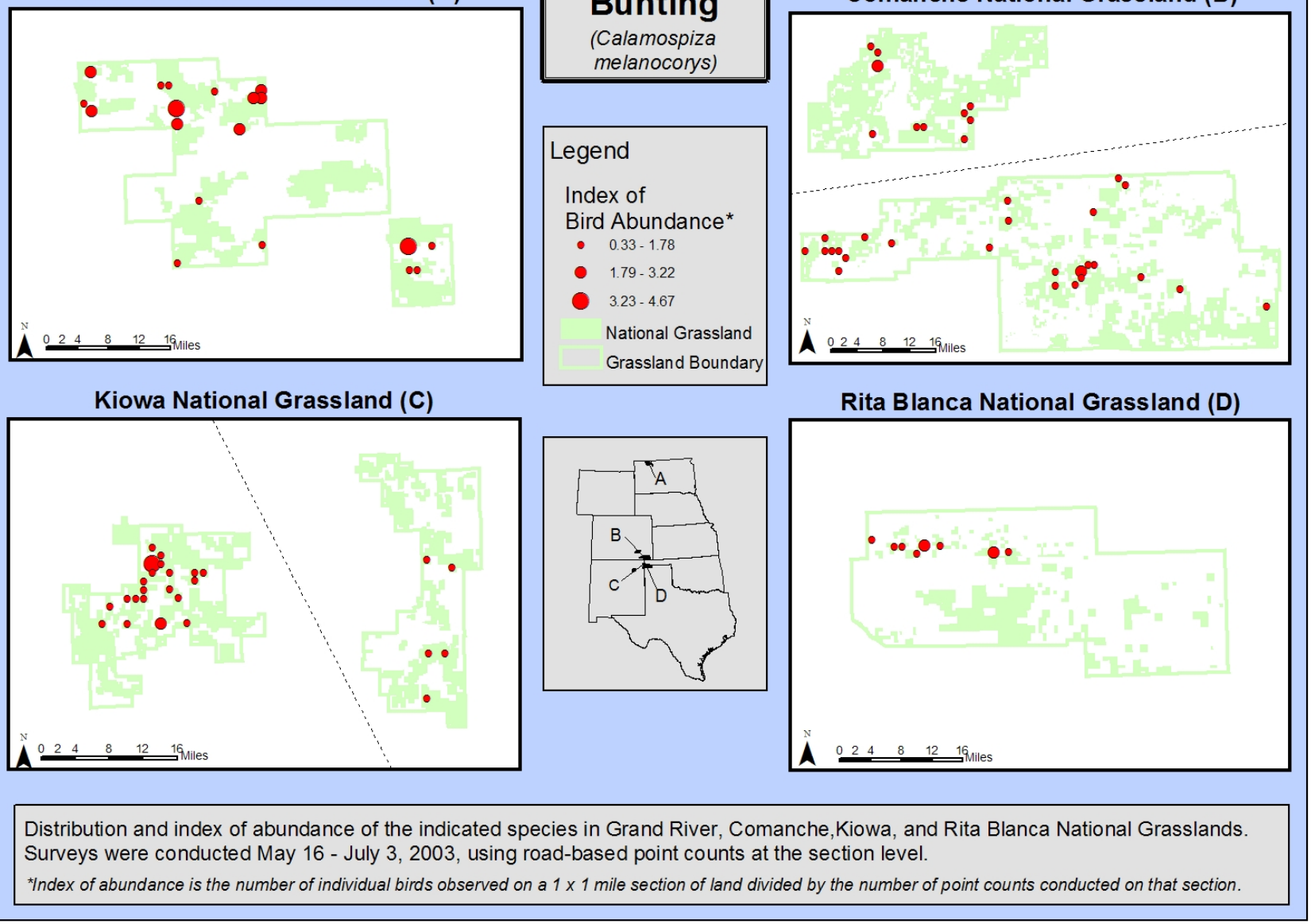
Lark Bunting

(Calamospiza melanocorys)



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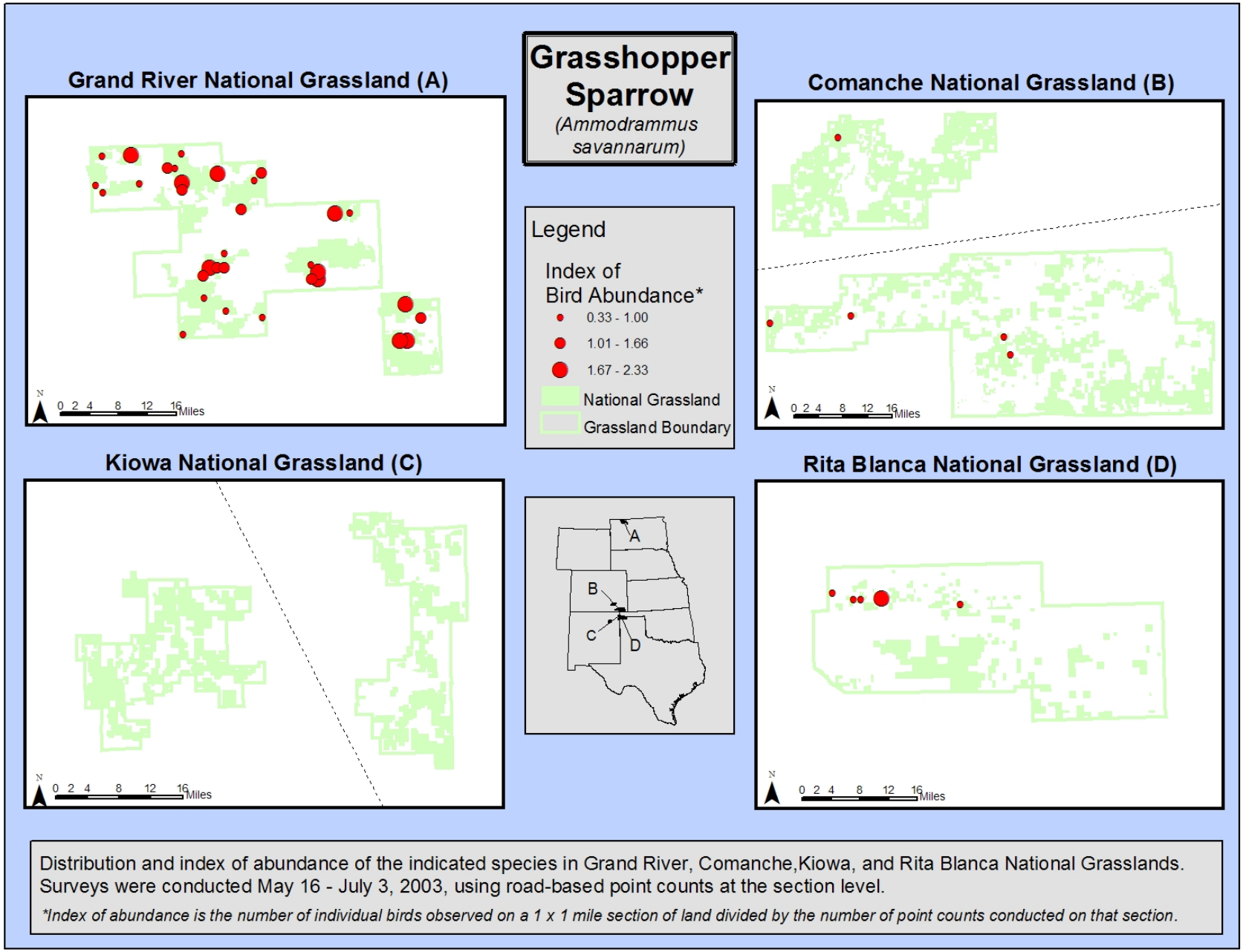

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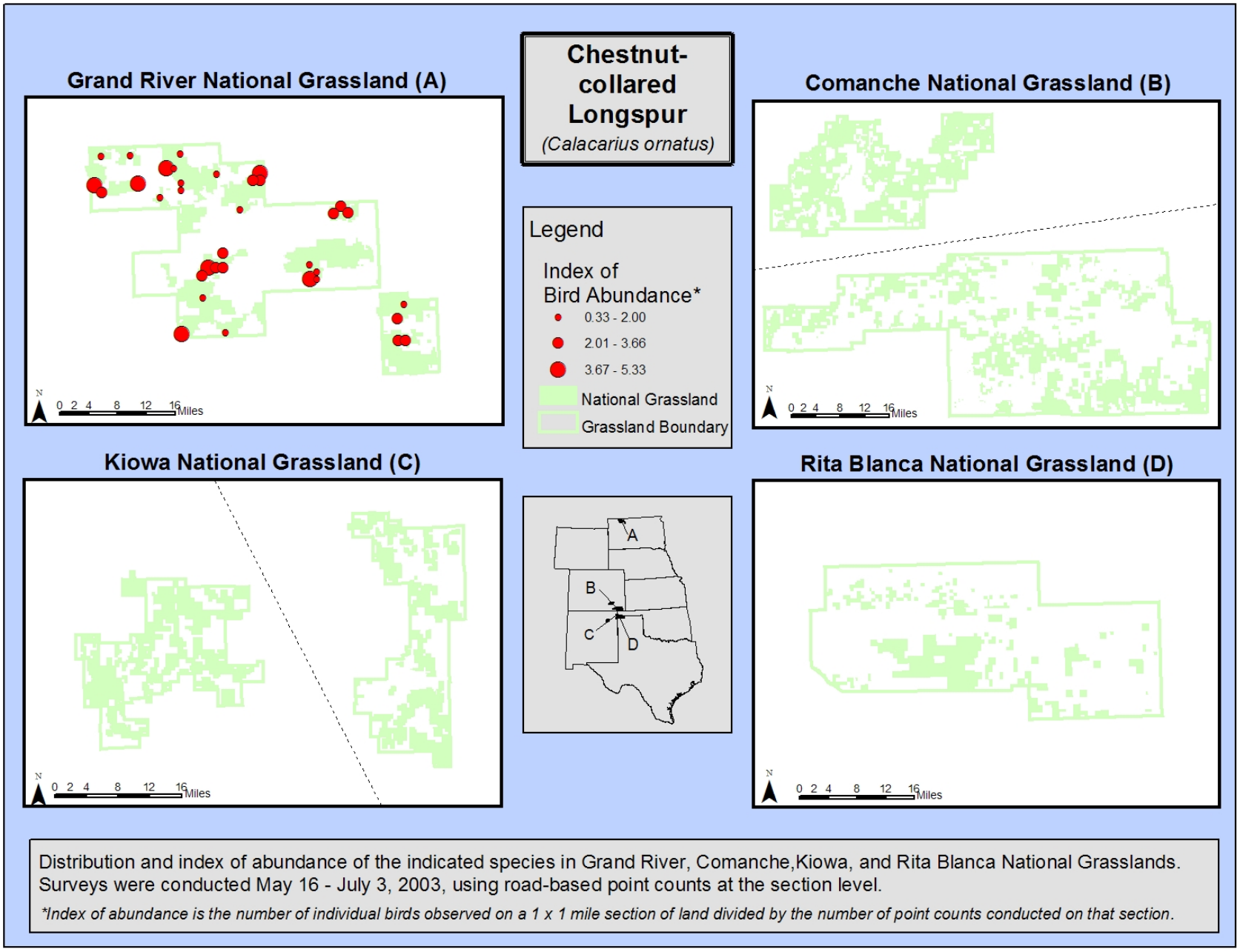

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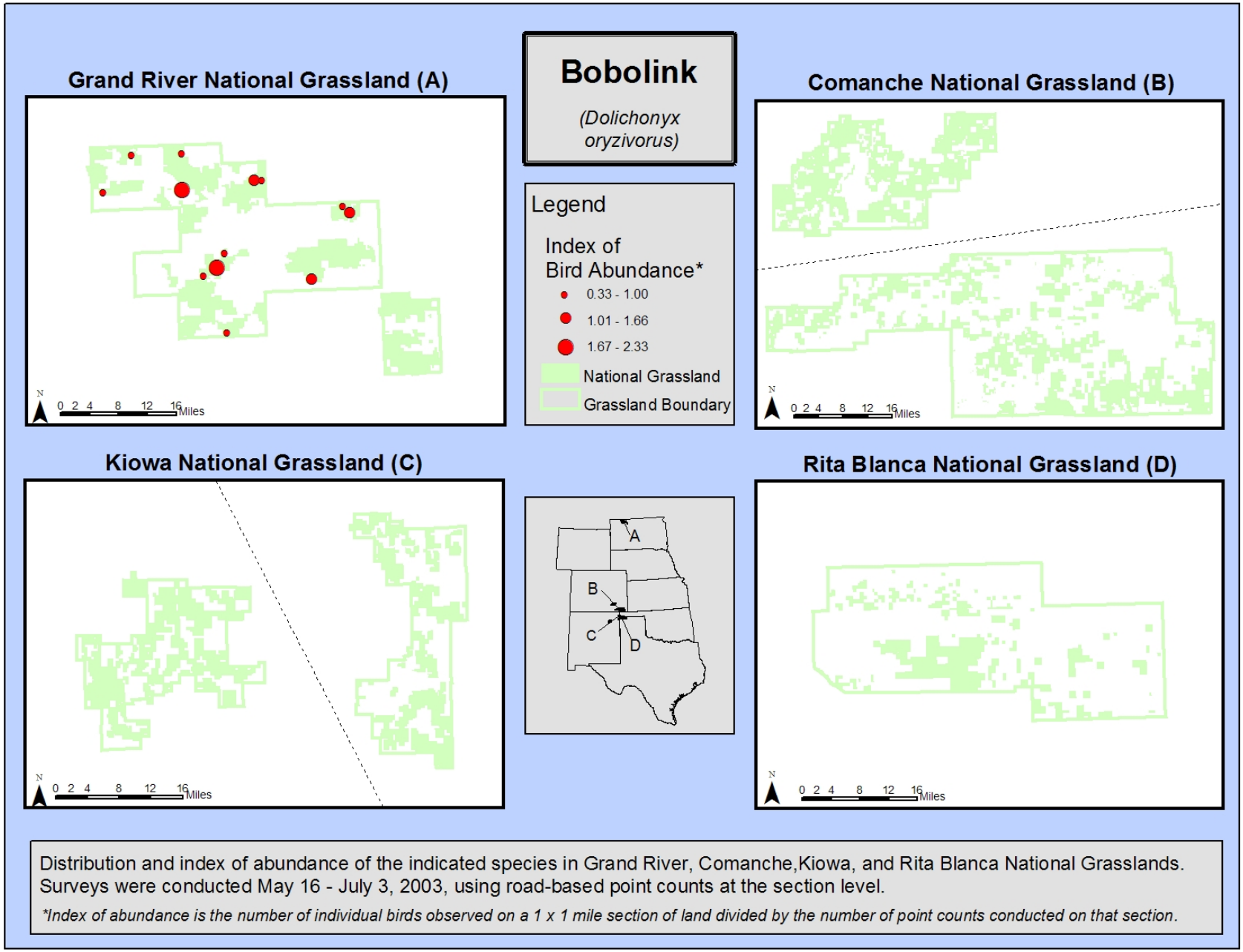

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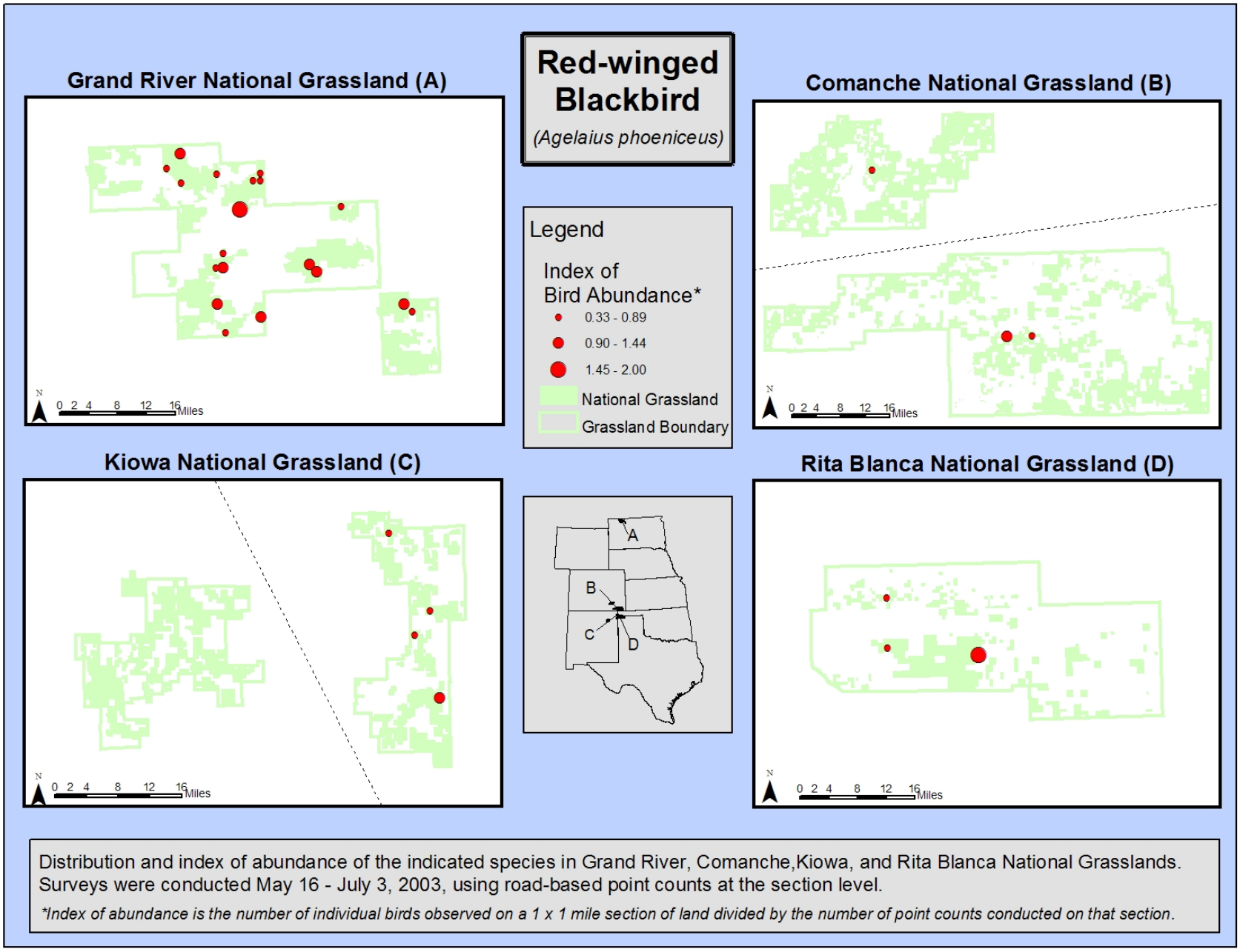

Distribution and index of abundance of the indicated species in Grand River, Comanche,Kiowa, and Rita Blanca National Grasslands. Surveys were conducted May 16 - July 3, 2003, using road-based point counts at the section level.

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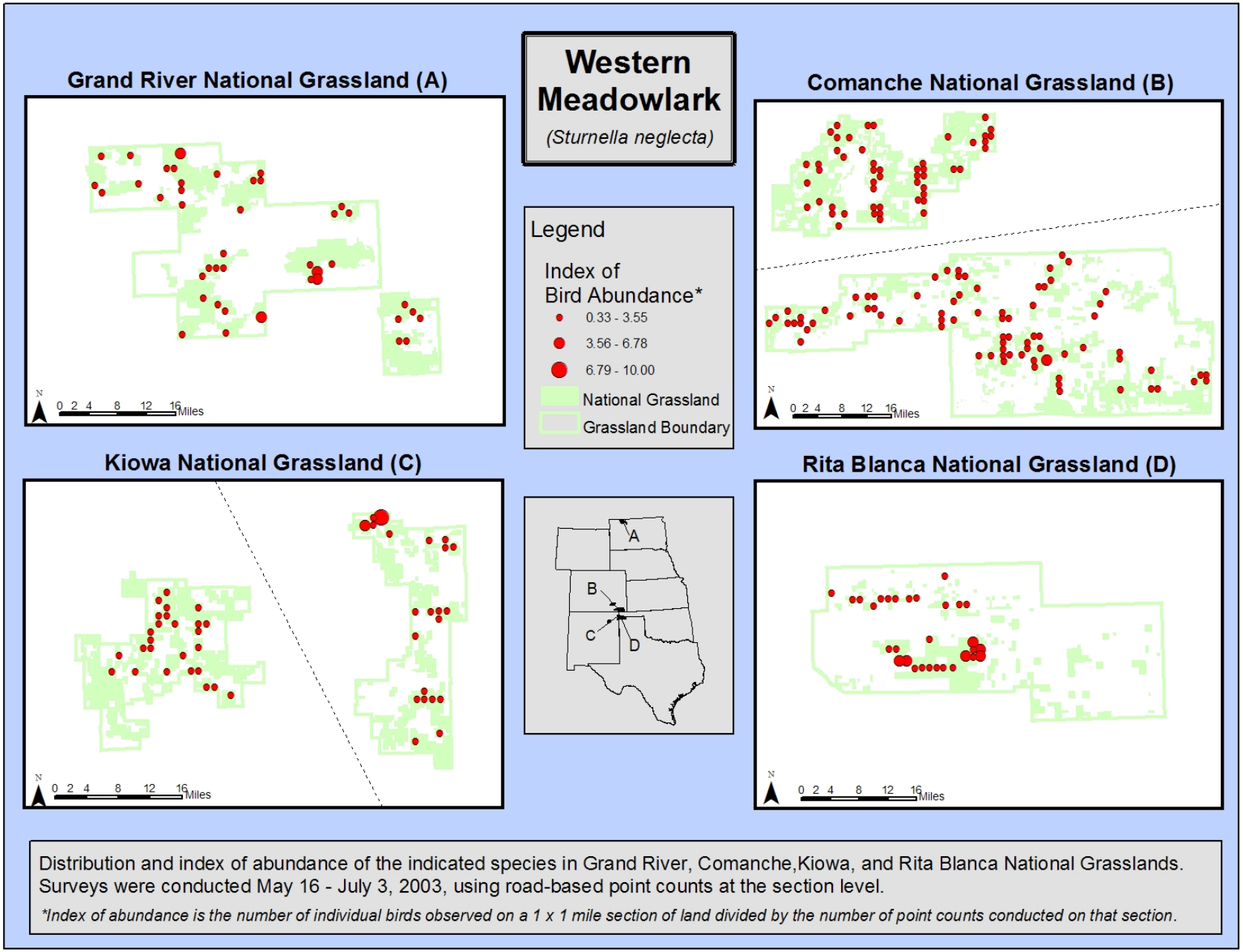

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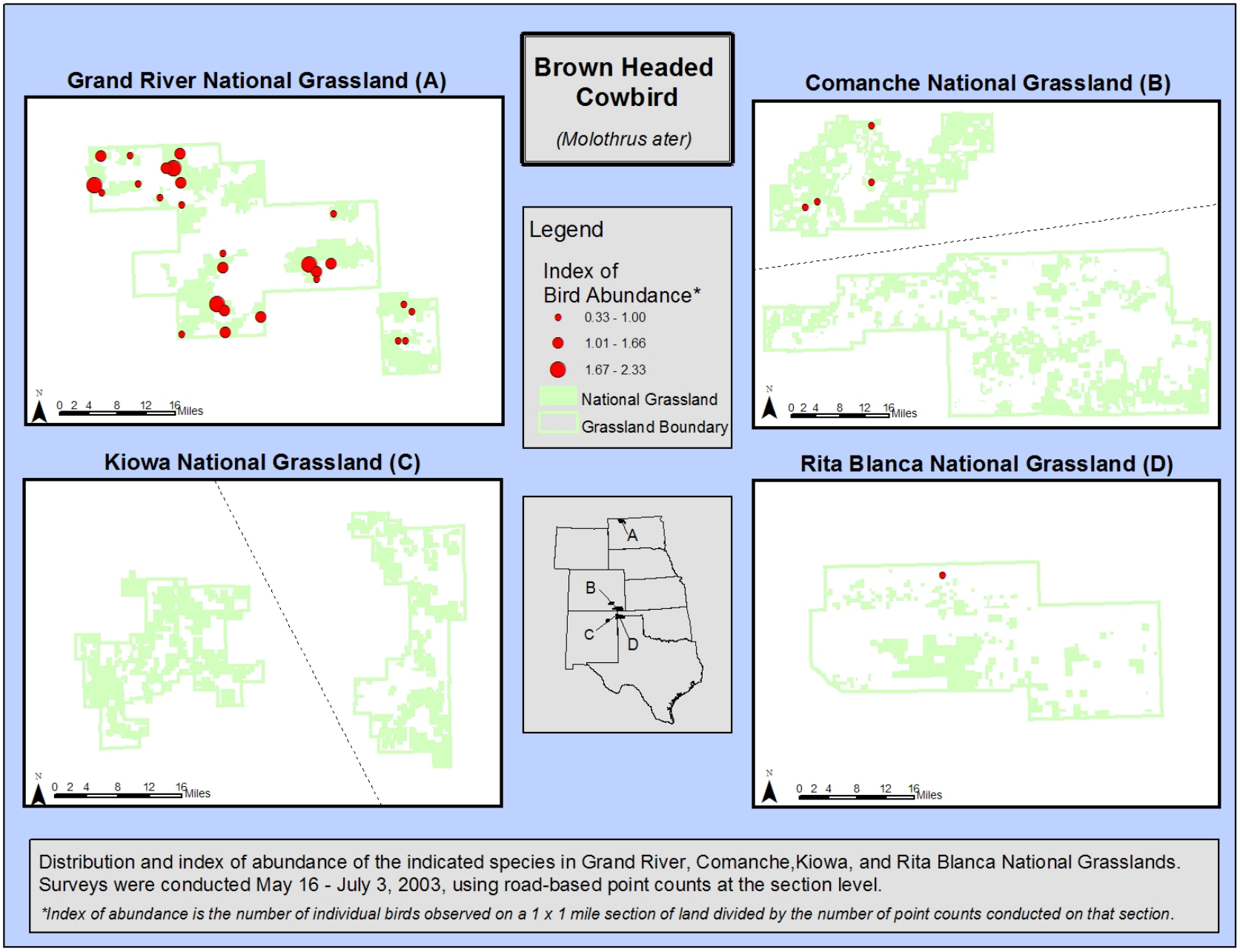

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APPENDIX B

Presence (X) or absence (blank) of all species detected on the Grand River, Comanche, Kiowa, and Rita Blanca National Grasslands (May 16 – July 3, 2003).

Common Name	Scientific Name	Grand River	Comanche	Kiowa	Rita Blanca
Gadwall	*Anas strepera*	X			
Mallard	*Anas platyrhynchos*	X		X	
Northern Pintail	*Anas acuta*	X			
Ring-necked Pheasant	*Phasianus colchicus*	X	X	X	
Scaled Quail	*Callipepla squamata*		X		X
Northern Bobwhite	*Colinus virginianus*		X		
Great Blue Heron	*Ardea herodias*			X	
Turkey Vulture	*Cathartes aura*	X	X	X	
Northern Harrier	*Circus cyaneus*	X	X		
Swainson's Hawk	*Buteo swainsoni*	X	X	X	X
Red-tailed Hawk	*Buteo jamaicensis*		X	X	
Ferruginous Hawk	*Buteo regalis*		X	X	X
American Kestrel	*Falco sparverius*	X	X		
Killdeer	*Charadrius vociferus*	X	X	X	X
American Avocet	*Recurvirostra americana*				X
Willet	*Catoptrophorus semipalmatus*	X			
Upland Sandpiper	*Bartramia longicauda*	X			
Long-billed Curlew	*Numenius americanus*		X	X	X
Marbled Godwit	*Limosa fedoa*	X	X		
Wilson's Snipe	*Gallinago delicata*	X			
Wilson's Phalarope	*Phalaropus tricolor*	X			
Mourning Dove	*Zenaida macroura*	X	X	X	X
Burrowing Owl	*Athene cunicularia*		X	X	X
Common Nighthawk	*Chordeiles minor*		X	X	X
Northern Flicker	*Colaptes auratus*	X			
Say's Phoebe	*Sayornis saya*		X	X	X
Ash-throated Flycatcher	*Myiarchus cinerascens*			X	
Cassin's Kingbird	*Tyrannus vociferans*			X	
Western Kingbird	*Tyrannus verticalis*	X	X	X	X
Eastern Kingbird	*Tyrannus tyrannus*	X			
Loggerhead Shrike	*Lanius ludovicianus*	X	X	X	
Warbling Vireo	*Vireo gilvus*	X			
Chihuahuan Raven	*Corvus cryptoleucus*		X	X	
Common Raven	*Corvus corax*		X	X	X
Horned Lark	*Eremophila alpestris*	X	X	X	X
Tree Swallow	*Tachycineta bicolor*			X	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	X			
Bank Swallow	*Riparia riparia*	X			
Cliff Swallow	*Petrochelidon pyrrhonota*	X	X	X	
Barn Swallow	*Hirundo rustica*	X	X	X	X
American Robin	*Turdus migratorius*	X			

Northern Mockingbird	*Mimus polyglottos*		X	X	X
Brown Thrasher	*Toxostoma rufum*	X			
European Starling	*Sturnus vulgaris*		X		
Sprague's Pipit	*Anthus spragueii*	X			X
Yellow Warbler	*Dendroica petechia*	X			
Common Yellowthroat	*Geothlypis trichas*	X	X		
Cassin's Sparrow	*Aimophila cassinii*	X	X	X	X
Brewer's Sparrow	*Spizella breweri*		X		X
Vesper Sparrow	*Pooecetes gramineus*	X		X	X
Lark Sparrow	*Chondestes grammacus*		X	X	X
Black-throated Sparrow	*Amphispiza bilineata*			X	
Lark Bunting	*Calamospiza melanocorys*	X	X	X	X
Savannah Sparrow	*Passerculus sandwichensis*	X		X	
Grasshopper Sparrow	*Ammodramus savannarum*	X	X		X
Baird's Sparrow	*Ammodramus bairdii*	X			
Chestnut-collared Longspur	*Calcarius ornatus*	X			
Indigo Bunting	*Passerina cyanea*			X	
Bobolink	*Dolichonyx oryzivorus*	X			
Red-winged Blackbird	*Agelaius phoeniceus*	X	X	X	X
Eastern Meadowlark	*Sturnella magna*				X
Western Meadowlark	*Sturnella neglecta*	X	X	X	X
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	X			
Brewer's Blackbird	*Euphagus cyanocephalus*	X			
Common Grackle	*Quiscalus quiscula*	X	X	X	X
Great-tailed Grackle	*Quiscalus mexicanus*			X	
Brown-headed Cowbird	*Molothrus ater*	X	X		X
Orchard Oriole	*Icterus spurius*	X			
Bullock's Oriole	*Icterus bullockii*		X		X
Baltimore Oriole	*Icterus galbula*	X			
House Finch	*Carpodacus mexicanus*				X
American Goldfinch	*Carduelis tristis*	X			