Monitoring of Grassland Birds on Little Missouri, Sheyenne and Grand River National Grasslands

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ROCKY MOUNTAIN BIRD OBSERVATORY

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***Research**:* *RMBO studies avian responses to habitat conditions, ecological processes, and management actions to provide scientific information that guides bird conservation efforts.*

***Monitoring**:* *RMBO monitors the distribution and abundance of birds through long-term, broad-scale monitoring programs designed to track population trends for birds of the region.*

***Education**:* *RMBO provides active, experiential, education programs for K-12 students in order to create an awareness and appreciation for birds, with a goal of their understanding of the need for bird conservation.*

***Outreach**:* *RMBO shares the latest information in land management and bird conservation practices with private landowners, land managers, and resource professionals at natural resource agencies. RMBO develops voluntary, working partnerships with these individuals and groups for habitat conservation throughout the Great Plains and Rocky Mountains.*

Bill Schmoker

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Executive Summary

Monitoring grassland birds is a valuable tool for effective management planning. The Forest Service and Rocky Mountain Bird Observatory (RMBO) recognized the need to monitor breeding bird populations in the Dakota grasslands, specifically on the Little Missouri, Sheyenne and Grand River National Grasslands. The objectives of this study were to: 1) use monitoring techniques to determine population trends and distributions for breeding birds on these National Grasslands, and 2) to compare these population trends with grouse lek counts within the same study area.

In 2004, we conducted thirty transects, in 2005 we conducted twenty four transects, in 2006 we conducted thirty four transects, and in 2007 we conducted twenty seven transects on Little Missouri, Sheyenne and Grand River National Grasslands using a point transect survey method developed by RMBO (Leukering 2000). Following this method, transects were carried out on 17 blocks located on these national grasslands. Monitoring National Grasslands in the Dakotas will provide density estimates for at least thirty two bird species and raw count data for 143 bird species. This report presents density estimate results and describes the goals and methodology of this bird monitoring program.

There is little information regarding bird species distributions and density estimates within these National Grasslands highlighting the importance of developing monitoring programs with the aim to understand population trends and underlying factors contributing to such trends. Monitoring National Grassland bird populations is a conservation need, which will help direct management actions for the preservation of bird populations and their ecosystem.

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). There is little doubt that the main bodies of North American prairie are among the continent's most endangered ecosystems (Sampson et al. 2004). Historically ecological drivers on the Great Plains included drought at the broad scale and grazing and fire at the landscape and local scales (Fuhlendorf and Engle 2001). Partners in Flight (PIF) found that 41% of upland breeding grassland bird species are declining and 30% lack enough data to assess population trends and stability in Bird Conservation Region (BCR) 11, in BCR 17, 38% of upland breeding grassland bird species are declining and 31% lack enough data to assess population trends and stability (Partners in Flight Species Assessment Database 2004). Little Missouri National Grassland and Grand River National Grassland fall in BCR 17 (Badlands and Prairies) and Sheyenne National Grassland falls in BCR 11 (Prairie Potholes) as designated by North American Bird Conservation Initiative.

Some managers have relied on data derived from the Breeding Bird Survey (BBS), currently the best and most extensive bird-monitoring program, to monitor bird populations (Robbins et al. 1989, Sauer 1993). The BBS, operational in the Great Plains since 1967, uses 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 very 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.

Consequently there are social and economic benefits with sustaining bird populations since observing birds is an increasing popular activity. United States Fish and Wildlife Service reported 46 million birdwatchers in America spent more than $32 billion on birding and related activities (USFWS 2003).

In 2004, RMBO and the Forest Service initiated this study in response to the need for more comprehensive population trends and distributions for breeding birds and to compare Sharp-tailed Grouse counts with the monitoring data within the Dakota Grasslands (Figure 1).

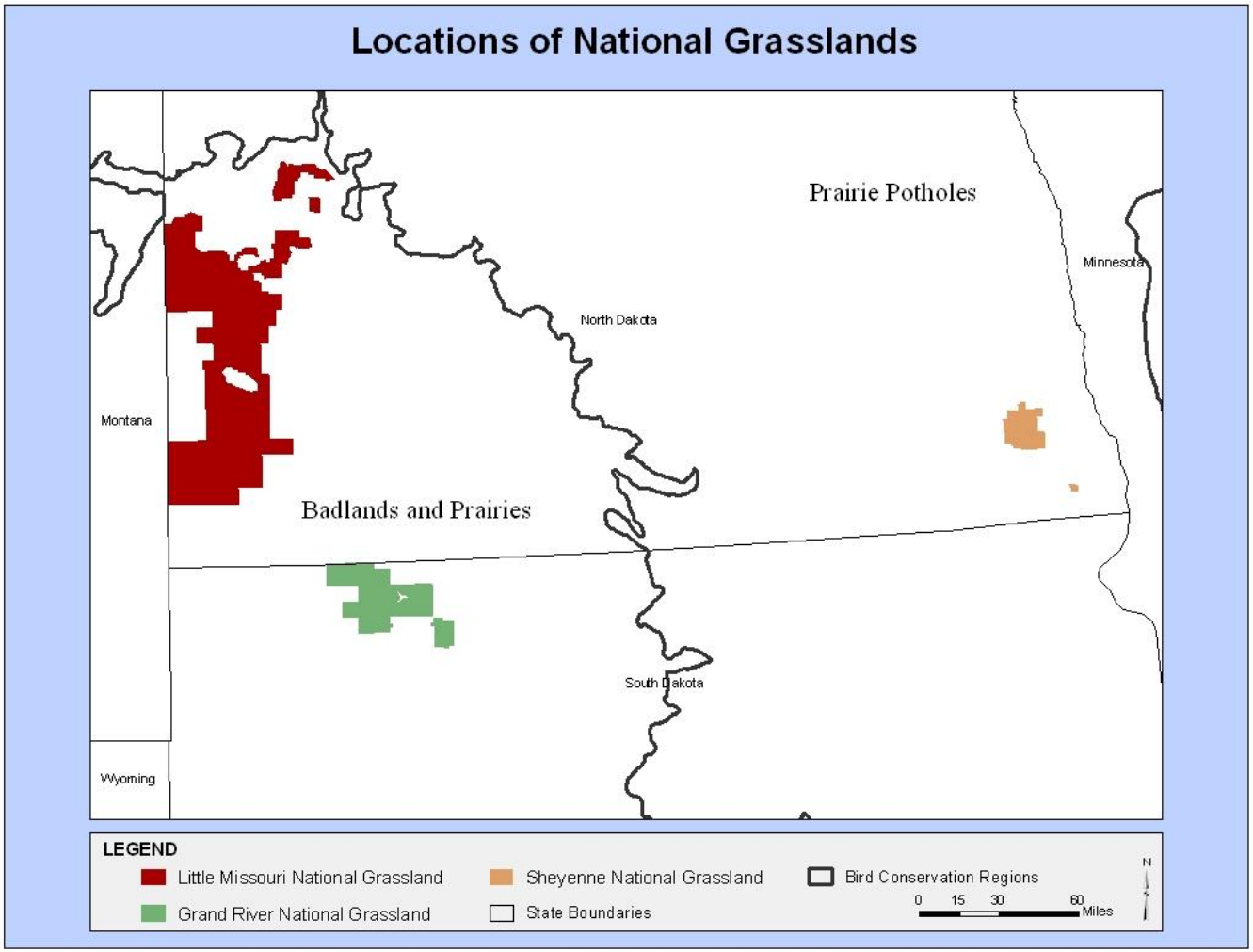

Figure 1. Study Area.

Methodology

Data was collected on three National Grasslands, Little Missouri, Sheyenne and Grand River on June 4 - 15, 2004 and June 5 – 12, 2005, June 18 – July 10, 2006, and June 15-July 17, 2007. Experienced field biologists trained in bird identification and point transect methodology conducted all field work.

Section Selection

North Dakota State University and Dakota Parks and Game have cooperatively designed a grouse-survey protocol. Under this protocol, they will annually conduct lek surveys within 17 randomly chosen blocks. In spring 2003 the Forest Service investigated approximately 24 randomly chosen blocks, and selected the 17 blocks that best met design criteria (such as containing a minimum number of leks, minimum road access network, etc.). The total acreage of all 17 blocks is 136,960 acres. Two point transects were established in each of these seventeen blocks. (Figure 2). Due to a road closure one block in Little Missouri was not surveyed and due to bad weather two point transects were not conducted, one in Little Missouri National Grassland and Sheyenne National Grassland. Two transects were placed in each block with each transect starting point established systematically with a random bearing within the designated blocks.

Point Transect Protocol

RMBO surveyed bird populations in each block selected for monitoring using the point transect method (Buckland et al. 1993). Each transect was surveyed by one observer following protocol established by Leukering (2000). On the morning of the survey, the observer began the point transect at the first count station and then continued along the pre-selected bearing for all remaining points if possible. Observers conducted up to eight five-minute point counts at stations located at 250 meter intervals along each point transect, recording all bird detections on standardized forms.

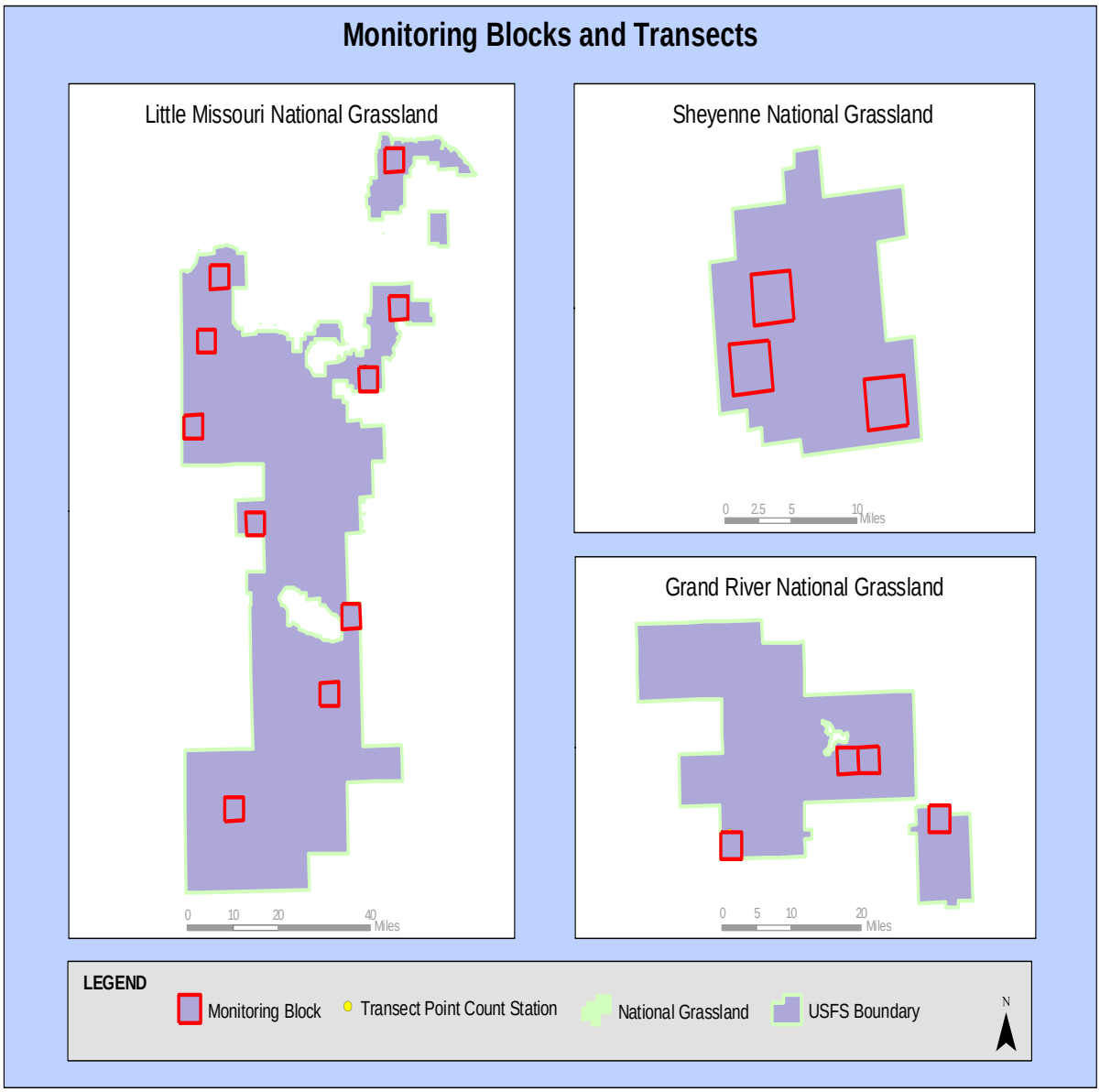

Figure 2. Monitoring blocks and transect locations.

Distance from the observer to the point of first detection was also recorded for each bird observed. Distances were determined using a Bushnell Yardage Pro 500 Rangefinder. Method of detection (e.g., visually, aurally), sex (if known), and habitat (e.g., shrub, ground, fence, etc.) were recorded. Birds flying over the section were tallied separately. Locations of the points were recorded using a Garmin *etrex* global positioning system (GPS) unit.

Observers conducted point counts from sunrise until no later than 1100 hrs when detectable activity typically slowed or ceased. We also recorded survey "start" and "end" times. Surveys were not conducted during times of rain or wind in excess of 18 mph. Observers recorded weather conditions such as percent cloud cover, wind speed (Beaufort Scale), and temperature in Fahrenheit. In addition to point count data, we documented vegetation characteristics, and locations of raptor nests and black-tailed prairie dog colonies.

We recorded vegetation characteristics within a 50- m radius of each point count. Vegetation data collected included the percent coverage and types of shrubs and percent coverage and height of ground cover.

Data Analysis

Program DISTANCE version 5.0 (Thomas 1998-99) will be 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) will be calculated for species that had a minimum of 20 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. In DISTANCE analysis, a unique detection function is fit to each distribution of distances associated with a species. Because the detection function is unique to each species, DISTANCE analysis avoids some serious problems inherent in traditional analyses of point count data (e.g., unquantifiable differences in detectability among habitats, species, and years). The three models that were used to find the most appropriate detection function is Half-normal Cosine, Hazard-rate Simple Polynomial and Hazard-rate Cosine . We pooled data from all years for each grassland and used Akaike's Information Criteria (AIC) to evaluate three models and determined the most appropriate detection function for each species. Density estimates for species in individual grasslands were derived using this global detection function, with year as a stratum. We calculated the global density estimate (i.e. across years) for each grassland using the mean of the year estimates weighted by total effort. Analysis using DISTANCE assumes that: 1) all birds at distance zero 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.

The distribution maps are represented by round symbols, that indicate the presence of a given species in at least one year from 2004 to 2007 (Appendix A).

Results

We conducted 30 point transects in 2004, 33 transects in 2005, 34 transects in 2006 and 27 transects in 2007 on Little Missouri, Sheyenne and Grand River National Grasslands. We observed 143 species in total; 93 in 2004, 102 in 2005, 91 in 2006 and 116 in 2007. We should be able to calculate density estimates for thirty two species using a global detection function to estimate density per year. Appendix A presents species distribution for 2004 to 2007. The species distribution maps indicate the presence of a species if it was observed in at least one year (2004 – 2007) symbolized by a round marker. Appendix B presents species observed and number of detections for all years.

Table 1. Grand River National Grassland density estimates of breeding birds by year with a global estimate. D = Density estimate expressed in birds/ km^2, LCL & UCL = 90% lower and upper confidence limits of D, n = number of detections used to obtain density estimates, %CV = percent coefficient of variation.

Common Name	Year	Density	%CV	LCI	UCI	n
Ring-necked Pheasant	2004	0.32	67	0.11	0.95	5
Ring-necked Pheasant	2005	0.00				0
Ring-necked Pheasant	2006	0.00				0
Ring-necked Pheasant	2007	1.08	51	0.46	2.49	17
Ring-necked Pheasant	Global	0.36	46	0.17	0.76	22
Killdeer	2004	1.00	65	0.34	2.95	5
Killdeer	2005	0.92	69	0.29	2.94	4
Killdeer	2006	4.06	59	1.53	10.80	18
Killdeer	2007	2.61	44	1.25	5.42	11
Killdeer	Global	2.19	38	1.17	4.10	38
Upland Sandpiper	2004	18.91	31	11.29	31.69	50
Upland Sandpiper	2005	8.65	53	3.50	21.35	20
Upland Sandpiper	2006	26.48	28	16.83	41.65	62
Upland Sandpiper	2007	27.61	28	17.32	44.01	73
Upland Sandpiper	Global	20.79	25	13.87	31.18	205
Mourning Dove	2004	8.17	49	3.69	18.08	21
Mourning Dove	2005	5.39	45	2.55	11.39	13
Mourning Dove	2006	6.92	50	3.05	15.68	19
Mourning Dove	2007	11.95	43	5.85	24.38	34
Mourning Dove	Global	8.19	34	4.72	14.21	87
Western Kingbird	2004	9.73	127	1.84	51.41	5
Western Kingbird	2005	4.45	132	0.80	24.65	2
Western Kingbird	2006	9.73	129	1.81	52.24	4
Western Kingbird	2007	25.30	119	5.08	126.11	13
Western Kingbird	Global	12.56	118	2.54	61.97	24
Eastern Kingbird	2004	5.99	40	3.01	11.91	14
Eastern Kingbird	2005	0.98	67	0.31	3.10	2
Eastern Kingbird	2006	1.71	56	0.65	4.50	4
Eastern Kingbird	2007	8.56	37	4.53	16.15	20
Eastern Kingbird	Global	4.42	28	2.79	7.00	40

Common Name	Year	Density	%CV	LCI	UCI	n
Horned Lark	2004	28.54	62	10.35	78.73	23
Horned Lark	2005	51.06	44	25.16	103.62	29
Horned Lark	2006	98.04	36	54.77	175.50	75
Horned Lark	2007	151.41	39	80.37	285.22	114
Horned Lark	Global	83.27	34	47.93	144.68	241
Sprague's Pipit	2004	1.81	51	0.74	4.41	6
Sprague's Pipit	2005	12.73	35	6.82	23.78	37
Sprague's Pipit	2006	3.01	52	1.22	7.44	10
Sprague's Pipit	2007	1.81	51	0.74	4.41	6
Sprague's Pipit	Global	4.59	28	2.87	7.33	59
Lark Bunting	2004	10.05	66	3.22	31.39	36
Lark Bunting	2005	27.62	35	14.61	52.24	65
Lark Bunting	2006	15.21	37	7.74	29.89	52
Lark Bunting	2007	41.55	20	29.09	59.36	141
Lark Bunting	Global	23.48	17	17.61	31.31	294
Grasshopper Sparrow	2004	41.55	20	29.80	57.95	36
Grasshopper Sparrow	2005	110.81	24	73.86	166.25	84
Grasshopper Sparrow	2006	65.79	21	45.93	94.24	57
Grasshopper Sparrow	2007	92.34	21	64.35	132.51	80
Grasshopper Sparrow	Global	76.55	17	57.82	101.35	257
Chestnut-collared Longspur	2004	11.62	86	3.15	42.79	11
Chestnut-collared Longspur	2005	19.31	76	5.96	62.55	13
Chestnut-collared Longspur	2006	9.50	99	2.17	41.60	8
Chestnut-collared Longspur	2007	88.70	55	37.52	209.69	81
Chestnut-collared Longspur	Global	32.70	53	14.37	74.43	113
Red-winged Blackbird	2004	5.44	55	2.10	14.12	16
Red-winged Blackbird	2005	5.05	69	1.57	16.31	9
Red-winged Blackbird	2006	3.40	43	1.61	7.17	10
Red-winged Blackbird	2007	5.44	40	2.74	10.82	13
Red-winged Blackbird	Global	4.83	31	2.91	8.02	48
Western Meadowlark	2004	5.99	40	3.01	11.91	14
Western Meadowlark	2005	0.98	67	0.31	3.10	2
Western Meadowlark	2006	1.71	56	0.65	4.50	4
Western Meadowlark	2007	8.56	37	4.53	16.15	20
Western Meadowlark	Global	4.42	28	2.79	7.00	40
Brown-headed Cowbird	2004	67.26	23	45.69	99.01	72
Brown-headed Cowbird	2005	21.74	54	8.49	55.68	19
Brown-headed Cowbird	2006	100.71	18	73.95	137.14	103
Brown-headed Cowbird	2007	66.58	18	49.35	89.82	80
Brown-headed Cowbird	Global	65.44	15	51.24	83.56	274

Table 2. Little Missouri National Grassland density estimates of breeding birds by year with a global estimate. D = Density estimate expressed in birds/ km^2, LCL & UCL = 90% lower and upper confidence limits of D, n = number of detections used to obtain density estimates, %CV = percent coefficient of variation.

Common Name	Year	Density	%CV	LCI	UCI	n
Ring-necked Pheasant	2004	0.83	88	0.23	3.05	12
Ring-necked Pheasant	2005	0.27	101	0.07	1.12	4
Ring-necked Pheasant	2006	0.00				0
Ring-necked Pheasant	2007	0.82	99	0.20	3.34	6
Ring-necked Pheasant	Global	0.42	86	0.12	1.50	22
Red-tailed Hawk	2004	0.20	58	0.08	0.50	5
Red-tailed Hawk	2005	0.46	39	0.24	0.88	12
Red-tailed Hawk	2006	0.21	40	0.11	0.40	6
Red-tailed Hawk	2007	0.08	103	0.02	0.37	1
Red-tailed Hawk	Global	0.26	29	0.16	0.42	24
Killdeer	2004	0.28	68	0.10	0.82	2
Killdeer	2005	1.10	63	0.41	2.94	9
Killdeer	2006	1.50	48	0.69	3.26	11
Killdeer	2007	0.55	92	0.13	2.32	2
Killdeer	Global	0.92	37	0.51	1.68	24
Upland Sandpiper	2004	0.70	58	0.28	1.76	13
Upland Sandpiper	2005	0.37	53	0.16	0.87	7
Upland Sandpiper	2006	1.16	42	0.59	2.28	24
Upland Sandpiper	2007	0.53	60	0.20	1.41	5
Upland Sandpiper	Global	0.73	35	0.41	1.28	49
Mourning Dove	2004	1.12	34	0.63	1.98	11
Mourning Dove	2005	1.50	49	0.68	3.31	11
Mourning Dove	2006	3.81	23	2.58	5.62	39
Mourning Dove	2007	2.48	20	1.79	3.44	81
Mourning Dove	2007	4.19	36	2.23	7.87	20
Western Kingbird	2004	0.59	66	0.21	1.65	4
Western Kingbird	2005	1.72	57	0.69	4.29	11
Western Kingbird	2006	0.51	83	0.15	1.76	4
Western Kingbird	2007	0.86	104	0.18	4.16	3
Western Kingbird	Global	0.92	42	0.47	1.79	22
Eastern Kingbird	2004	2.71	49	1.22	6.03	14
Eastern Kingbird	2005	1.33	51	0.58	3.03	7
Eastern Kingbird	2006	2.76	44	1.35	5.62	14
Eastern Kingbird	2007	5.32	39	2.72	10.39	14
Eastern Kingbird	Global	2.70	27	1.73	4.23	49
Red-eyed Vireo	2004	1.32	54	0.55	3.16	7
Red-eyed Vireo	2005	3.33	48	1.52	7.32	18
Red-eyed Vireo	2006	3.02	48	1.39	6.58	18
Red-eyed Vireo	2007	5.18	64	1.78	15.10	14
Red-eyed Vireo	Global	2.95	30	1.80	4.83	57
American Crow	2004	0.28	47	0.13	0.61	11
American Crow	2005	0.83	31	0.50	1.38	31
American Crow	2006	0.45	38	0.24	0.85	17

Common Name	Year	Density	%CV	LCI	UCI	n
American Crow	2007	1.00	41	0.50	2.02	20
American Crow	Global	0.59	23	0.40	0.86	79
Horned Lark	2004	1.18	48	0.54	2.60	7
Horned Lark	2005	3.14	43	1.56	6.35	18
Horned Lark	2006	6.31	43	3.10	12.85	42
Horned Lark	2007	6.29	51	2.61	15.15	19
Horned Lark	Global	4.02	28	2.54	6.35	86
Rock Wren	2004	0.77	85	0.22	2.75	5
Rock Wren	2005	0.60	65	0.22	1.68	4
Rock Wren	2006	2.19	44	1.08	4.45	16
Rock Wren	2007	0.91	76	0.27	3.08	3
Rock Wren	Global	1.18	37	0.65	2.15	28
House Wren	2004	2.22	32	1.30	3.81	10
House Wren	2005	4.14	33	2.40	7.15	19
House Wren	2006	9.88	29	6.11	16.00	50
House Wren	2007	9.58	35	5.16	17.77	22
House Wren	Global	6.14	20	4.40	8.58	101
Sprague's Pipit	2004	2.95	45	1.41	6.18	24
Sprague's Pipit	2005	10.48	23	7.07	15.52	87
Sprague's Pipit	2006	1.75	51	0.77	3.98	16
Sprague's Pipit	2007	3.37	72	1.02	11.19	14
Sprague's Pipit	Global	4.74	20	3.42	6.58	141
Yellow Warbler	2004	7.33	34	4.16	12.90	31
Yellow Warbler	2005	12.74	29	7.78	20.85	53
Yellow Warbler	2006	12.62	22	8.69	18.32	60
Yellow Warbler	2007	14.82	37	7.70	28.55	32
Yellow Warbler	Global	11.51	16	8.88	14.93	176
Ovenbird	2004	0.38	71	0.13	1.16	6
Ovenbird	2005	1.13	52	0.49	2.62	16
Ovenbird	2006	0.68	62	0.26	1.82	12
Ovenbird	2007	0.38	74	0.11	1.27	3
Ovenbird	Global	0.68	37	0.38	1.23	37
Yellow-breasted Chat	2004	2.35	41	1.19	4.65	19
Yellow-breasted Chat	2005	3.27	38	1.74	6.15	27
Yellow-breasted Chat	2006	6.93	26	4.47	10.75	63
Yellow-breasted Chat	2007	9.94	25	6.39	15.47	41
Yellow-breasted Chat	Global	5.08	18	3.77	6.83	150
Spotted Towhee	2004	18.06	31	10.72	30.41	60
Spotted Towhee	2005	16.22	29	9.98	26.36	55
Spotted Towhee	2006	48.99	21	34.17	70.24	178
Spotted Towhee	2007	48.36	27	29.90	78.20	82
Spotted Towhee	Global	31.29	15	24.42	40.08	375
Clay-colored Sparrow	2004	0.00				0
Clay-colored Sparrow	2005	5.04	48	2.31	10.99	21
Clay-colored Sparrow	2006	4.57	47	2.12	9.88	21
Clay-colored Sparrow	2007	1.92	57	0.72	5.10	4
Clay-colored Sparrow	2007	3.08	33	1.80	5.28	46

Common Name	Year	Density	%CV	LCI	UCI	n
Field Sparrow	2004	1.00	52	0.43	2.33	9
Field Sparrow	2005	6.94	24	4.59	10.50	64
Field Sparrow	2006	10.83	18	8.04	14.58	109
Field Sparrow	2007	17.13	22	11.51	25.48	79
Field Sparrow	Global	7.93	13	6.37	9.88	261
Vesper Sparrow	2004	4.74	28	2.97	7.56	39
Vesper Sparrow	2005	11.55	21	8.06	16.54	97
Vesper Sparrow	2006	18.05	17	13.61	23.93	163
Vesper Sparrow	2007	15.95	24	10.45	24.34	66
Vesper Sparrow	Global	12.30	12	10.09	14.99	365
Lark Sparrow	2004	1.91	56	0.77	4.72	9
Lark Sparrow	2005	0.83	59	0.32	2.13	4
Lark Sparrow	2006	4.90	42	2.45	9.81	23
Lark Sparrow	2007	13.71	37	7.20	26.12	33
Lark Sparrow	Global	4.18	26	2.70	6.46	69
Lark Bunting	2004	4.49	60	1.74	11.59	26
Lark Bunting	2005	2.44	79	0.71	8.35	6
Lark Bunting	2006	1.33	70	0.46	3.88	6
Lark Bunting	2007	0.33	103	0.07	1.57	1
Lark Bunting	Global	2.36	43	1.19	4.70	39
Savannah Sparrow	2004	3.48	57	1.41	8.62	5
Savannah Sparrow	2005	6.83	59	2.69	17.30	9
Savannah Sparrow	2006	2.48	70	0.84	7.30	4
Savannah Sparrow	2007	4.10	95	0.96	17.46	3
Savannah Sparrow	Global	4.19	43	2.09	8.41	21
Grasshopper Sparrow	2004	43.58	28	27.44	69.20	94
Grasshopper Sparrow	2005	83.12	26	54.17	127.52	183
Grasshopper Sparrow	2006	70.11	27	45.05	109.11	170
Grasshopper Sparrow	2007	79.94	36	43.47	147.00	85
Grasshopper Sparrow	Global	67.85	0	46.37	99.29	532
Lazuli Bunting	2004	0.80	76	0.25	2.58	3
Lazuli Bunting	2005	1.05	80	0.31	3.50	4
Lazuli Bunting	2006	1.19	85	0.33	4.23	5
Lazuli Bunting	2007	8.38	68	2.76	25.46	16
Lazuli Bunting	Global	2.05	47	0.95	4.42	28
Bobolink	2004	0.63	91	0.16	2.41	4
Bobolink	2005	0.15	100	0.04	0.65	1
Bobolink	2006	1.96	63	0.72	5.30	14
Bobolink	2007	4.31	84	1.12	16.56	14
Bobolink	Global	1.42	48	0.66	3.08	33
Western Meadowlark	2004	23.18	17	17.26	31.13	161
Western Meadowlark	2005	41.40	13	32.92	52.05	298
Western Meadowlark	2006	44.75	18	32.96	60.77	341
Western Meadowlark	2007	26.86	25	17.17	42.03	96
Western Meadowlark	Global	35.41	10	29.95	41.87	896
Brown-headed Cowbird	2004	13.72	30	8.30	22.67	36
Brown-headed Cowbird	2005	7.81	32	4.57	13.37	25

Common Name	Year	Density	%CV	LCI	UCI	n
Brown-headed Cowbird	2006	30.65	23	21.06	44.62	81
Brown-headed Cowbird	2007	14.38	33	8.06	25.64	21
Brown-headed Cowbird	Global	17.37	17	13.17	22.92	163
American Goldfinch	2004	2.28	102	0.51	10.26	3
American Goldfinch	2005	3.07	58	1.24	7.61	11
American Goldfinch	2006	2.28	55	0.96	5.41	9
American Goldfinch	2007	10.04	45	4.90	20.57	18
American Goldfinch	Global	3.58	43	1.79	7.15	41

Table 3. Sheyenne National Grassland density estimates of breeding birds by year with a global estimate. D = Density estimate expressed in birds/ km^2, LCL & UCL = 90% lower and upper confidence limits of D, n = number of detections used to obtain density estimates, %CV = percent coefficient of variation.

Common Name	Year	Density	%CV	LCI	UCI	n
Killdeer	2004	8.24	181	1.06	64.03	1
Killdeer	2005	61.71	165	8.81	432.10	8
Killdeer	2006	37.76	158	5.61	254.28	4
Killdeer	2007	105.74	158	15.74	710.27	13
Killdeer	Global	54.28	156	8.17	360.83	26
Eastern Kingbird	2004	3.99	56	1.45	10.97	5
Eastern Kingbird	2005	19.42	32	11.17	33.76	24
Eastern Kingbird	2006	13.17	26	8.43	20.56	16
Eastern Kingbird	2007	18.29	28	11.15	30.00	25
Eastern Kingbird	Global	13.89	22	9.72	19.85	70
Sedge Wren	2004	0.00				
Sedge Wren	2005	0.00				
Sedge Wren	2006	31.85	40	15.13	67.04	46
Sedge Wren	2007	52.85	41	24.63	113.43	78
Sedge Wren	Global	21.74	32	12.60	37.52	124
Clay-colored Sparrow	2004	10.76	42	4.94	23.44	21
Clay-colored Sparrow	2005	17.27	36	8.74	34.11	36
Clay-colored Sparrow	2006	11.74	31	6.60	20.90	25
Clay-colored Sparrow	2007	28.18	30	16.23	48.94	60
Clay-colored Sparrow	Global	17.12	20	12.19	24.05	142
Vesper Sparrow	2004	0.25	106	0.05	1.28	1
Vesper Sparrow	2005	0.47	80	0.13	1.69	2
Vesper Sparrow	2006	2.79	66	0.98	7.90	12
Vesper Sparrow	2007	3.02	73	0.95	9.61	13
Vesper Sparrow	Global	1.67	57	0.68	4.09	28
Dickcissel	2004	1.03	97	0.21	5.15	1
Dickcissel	2005	0.00				
Dickcissel	2006	32.03	42	15.09	67.98	32
Dickcissel	2007	6.59	33	3.73	11.65	7
Dickcissel	Global	10.16	36	5.37	19.20	40
Red-winged Blackbird	2004	15.80	54	5.77	43.24	32
Red-winged Blackbird	2005	17.69	35	9.09	34.40	38
Red-winged Blackbird	2006	42.38	25	26.97	66.61	69

Common Name	Year	Density	%CV	LCI	UCI	n
Red-winged Blackbird	2007	52.87	22	35.26	79.26	92
Red-winged Blackbird	Global	32.61	16	24.80	42.89	231
Brown-headed Cowbird	2004	29.97	27	18.57	48.37	34
Brown-headed Cowbird	2005	14.03	54	5.24	37.56	17
Brown-headed Cowbird	2006	43.63	23	29.98	63.51	34
Brown-headed Cowbird	2007	40.40	35	21.89	74.57	37
Brown-headed Cowbird	Global	32.15	20	23.07	44.81	122

Discussion

Monitoring National Grasslands in the Dakotas will provide density estimates for at least thirty two bird species and presence absence data for 143 bird species. Density estimates will describe population trends over time and the presence absence data will characterize bird distribution on these National Grasslands over time. This data can be used to address management actions needed to sustain healthy bird populations and ecosystem integrity.

According to the North American Landbird Conservation Plan (Rich et al. 2004), four species we will be able to calculate density estimates for – Baird's Sparrow, Sprague's Pipit, Lark Bunting, and Grasshopper Sparrow - are species of Continental Importance within the Prairie Avifaunal Biome. One species- Mountain Bluebird- is considered a species of Continental Importance within the Intermountain West Avifaunal Biome.

Baird's Sparrow is in the immediate action category while Lark Bunting, Grasshopper Sparrow, and Sprague's Pipit are in the management action category in need of on the ground conservation actions to reverse significant, long-term population declines or sustain vulnerable populations. Mountain Bluebird is placed in the long-term planning and responsibility action category indicating the need for long-term planning to maintain a sustainable population. Lark Bunting, Mountain Bluebird, and Grasshopper Sparrow are also listed as stewardship species; hence they are representative of their biome and are intended to represent bird characteristics and habitat within their biome. This plan was developed by Partners in Flight and serves as a blueprint for continental habitat conservation under the North American Bird Conservation Initiative (Rich et al. 2004).

In establishing bird monitoring at the grassland scale, important data is obtained with regard to frequency of occurrence and habitat types species are found in. National Grasslands form an integral part to understanding bird ecology and sustain healthy grassland conditions.

Monitoring at a local scale will result in more informed land management decisions regarding conservation of grassland birds and their habitat. Correlations can be drawn among avian trends, densities, diversity, and management practices. Evaluating management practices based on population trends and distributions will enable RMBO to focus conservation efforts and help land managers make decisions that conserve prairie birds in the Dakota grasslands.

Overall, point transect monitoring at a local 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 trends for all grassland bird species. No single technique can accomplish such an assessment of all grassland birds. Point transect 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 in the Dakota Grasslands.

Acknowledgements

We thank the U.S Forest Service for funding the project in particular Dan Svingen and to RMBO staff for review of the document and especially the field crew that collected the data.

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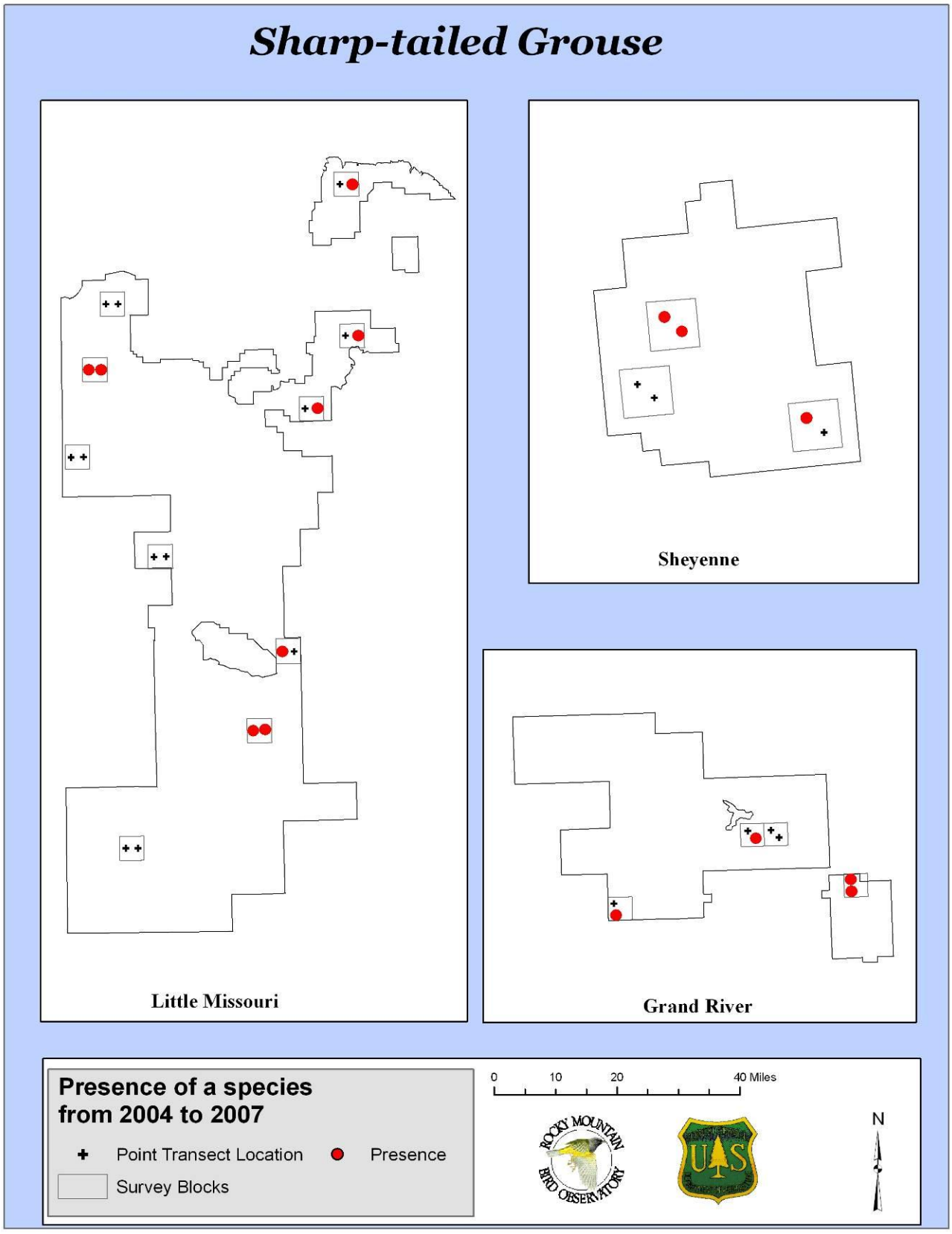
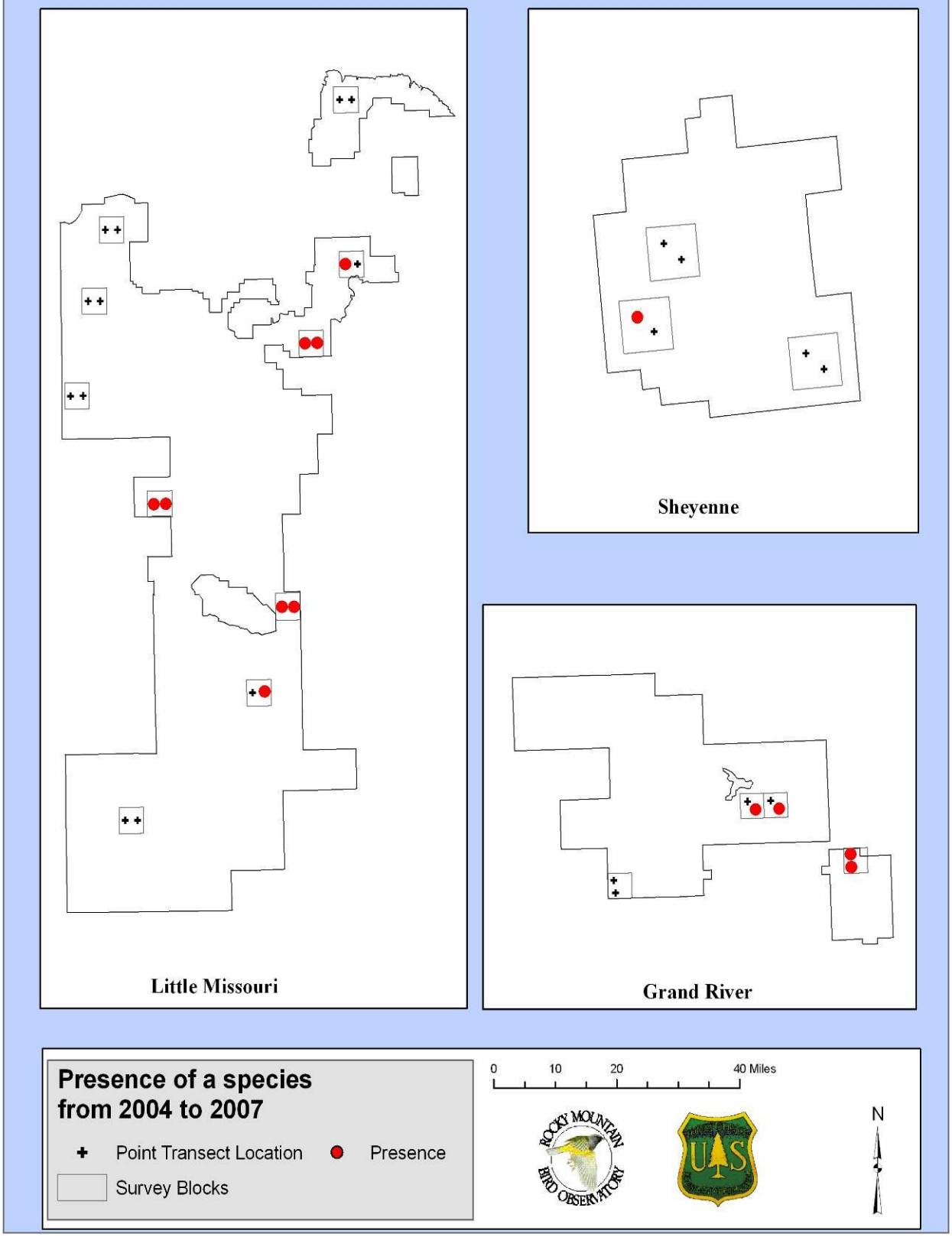
APPENDIX A - Species Distribution Maps

The distribution map for each species indicates presence of species from 2004 to 2007.


Sharp-tailed Grouse
Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
ROCKY MOUNTAIN
BIRD OBSERVATORY
N

Northern Harrier



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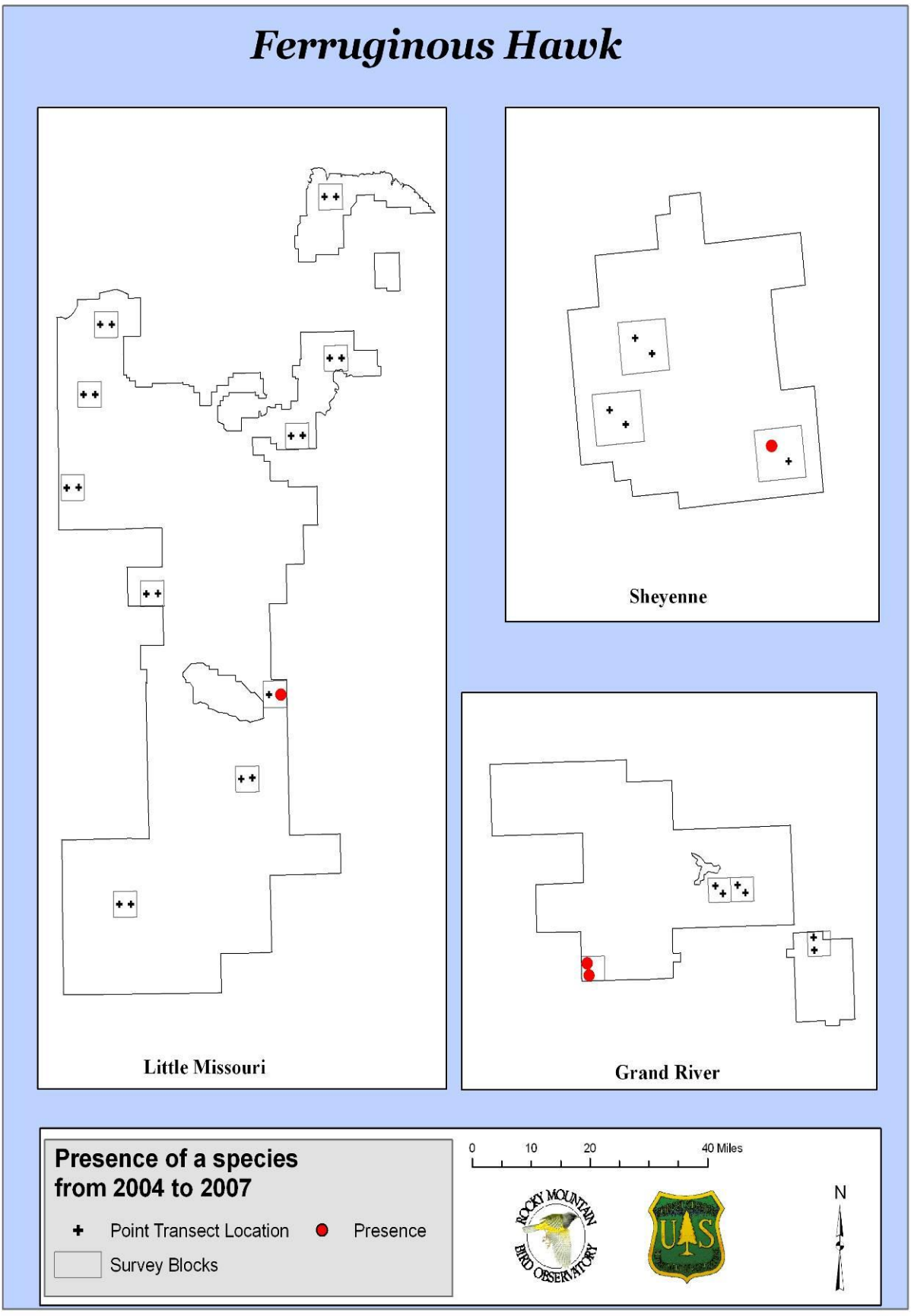
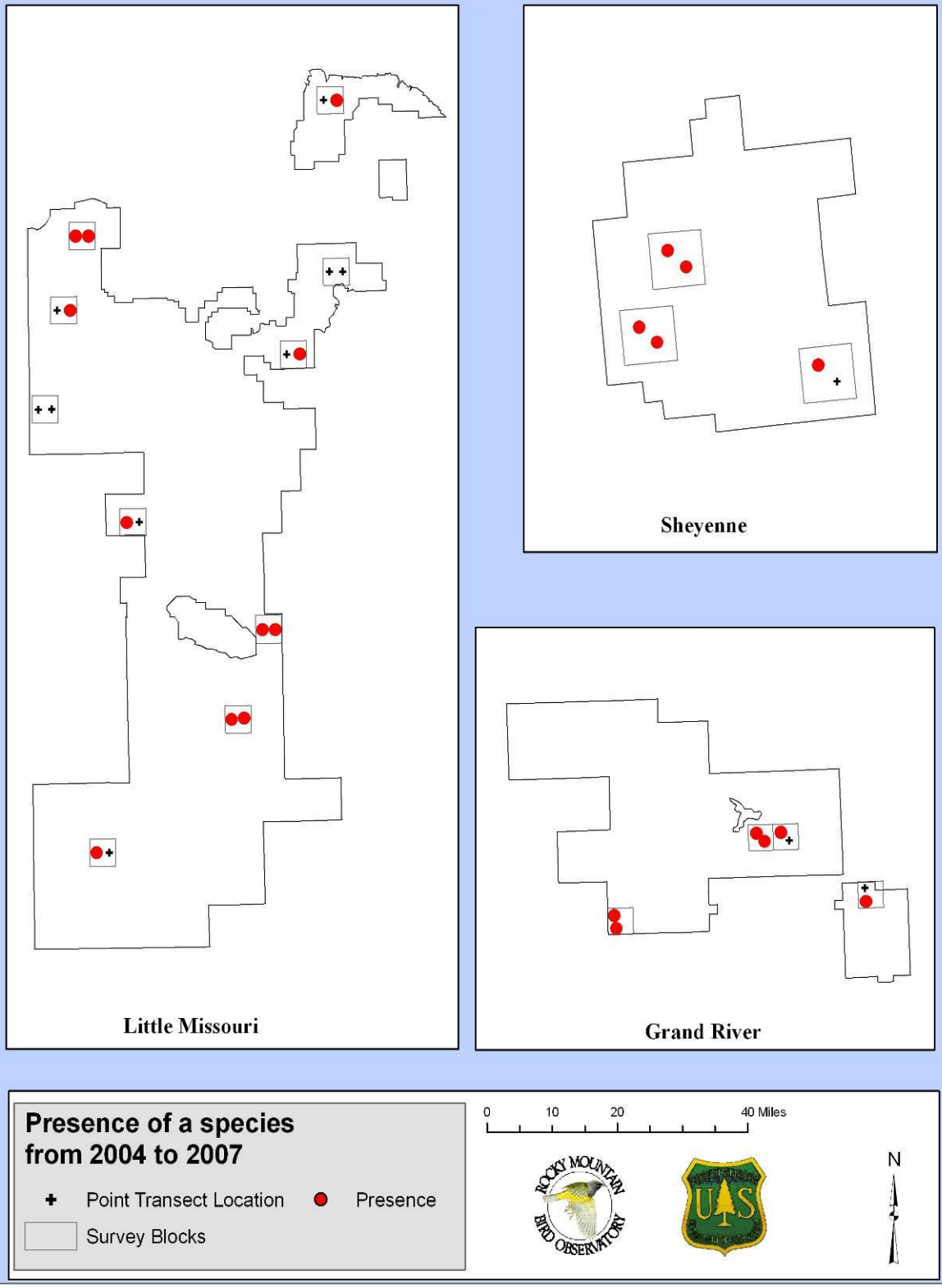
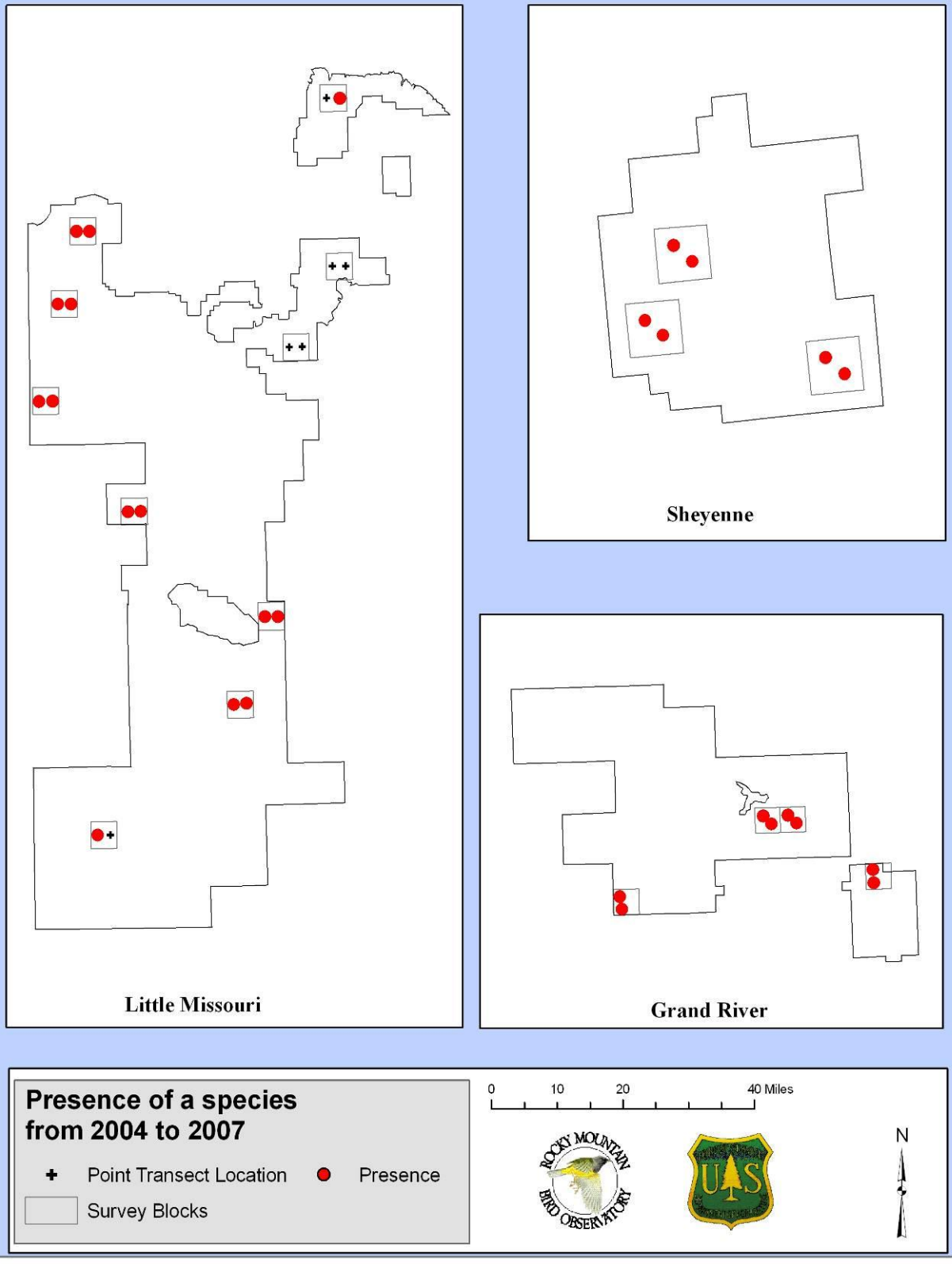


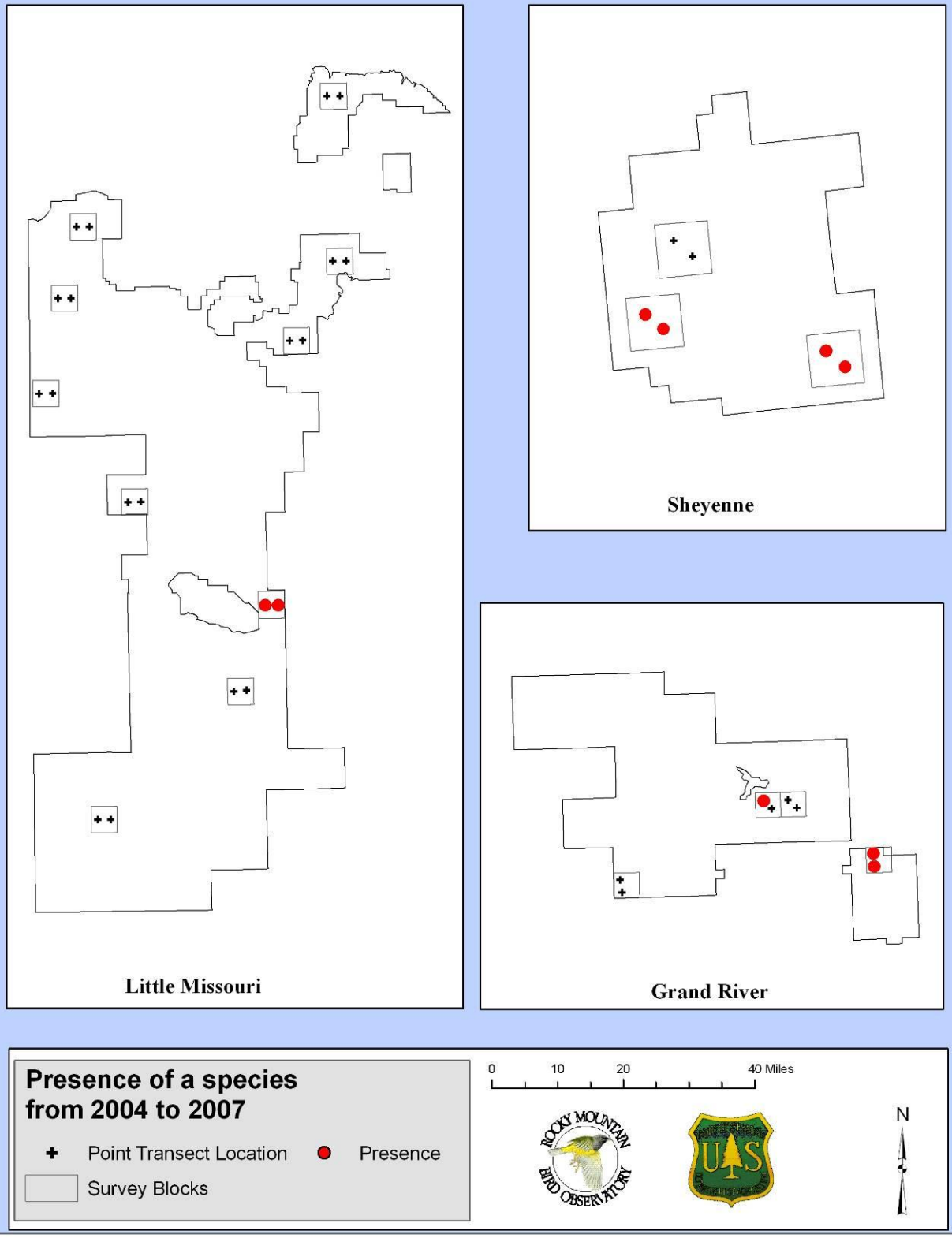
Killdeer


Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
ROCKY MOUNTAIN BIRD OBSERVATORY
N

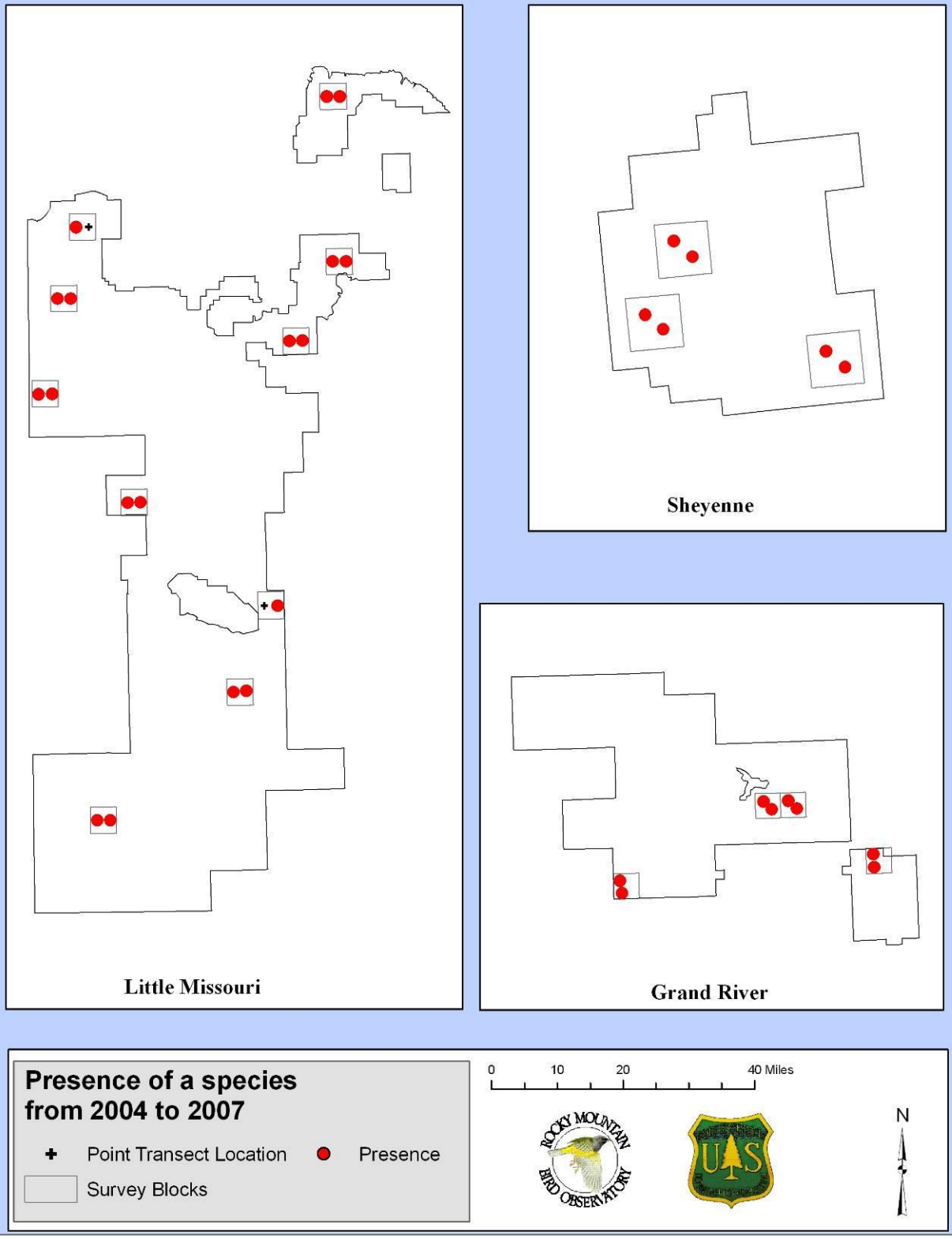
Upland Sandpiper

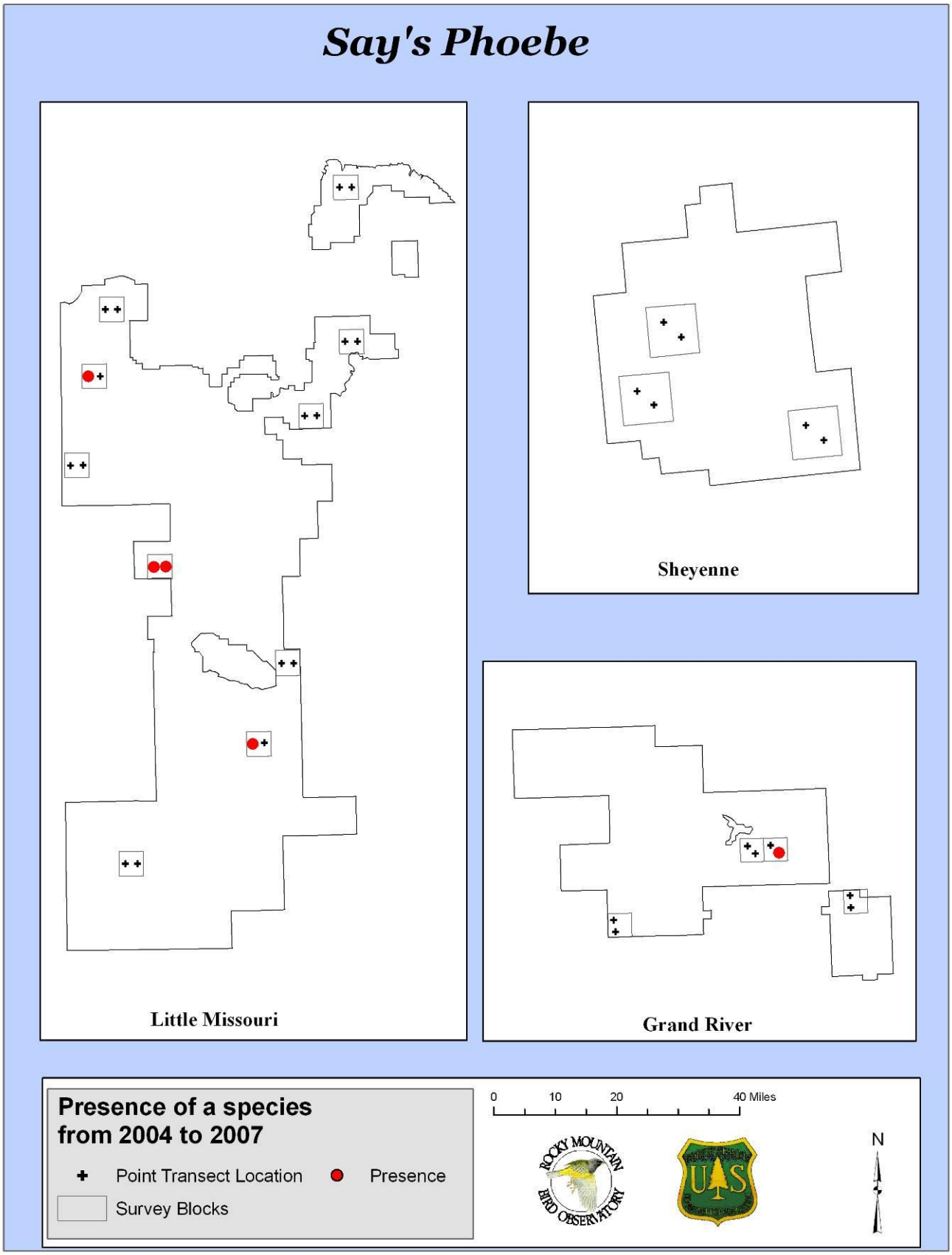


Marbled Godwit

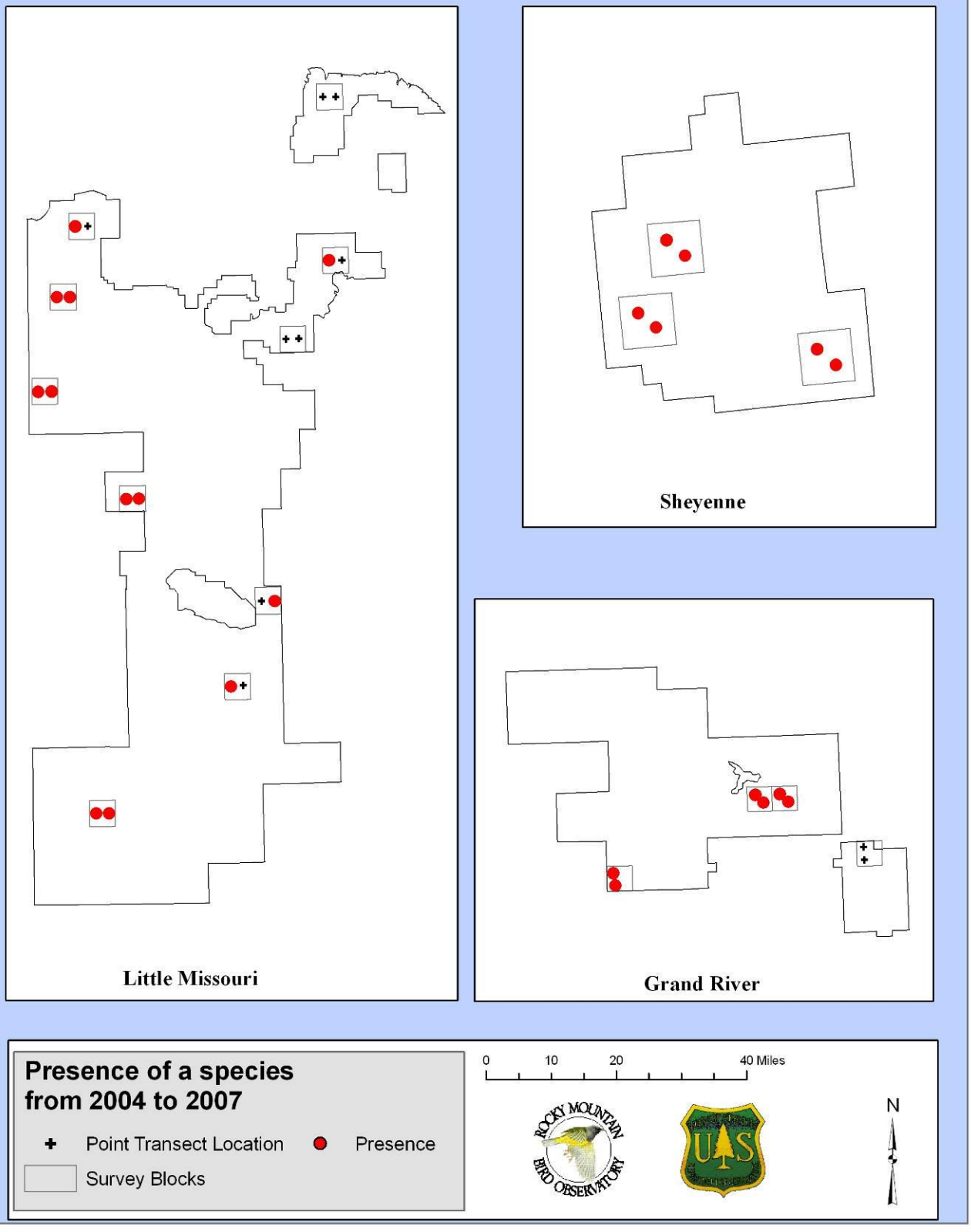


Mourning Dove

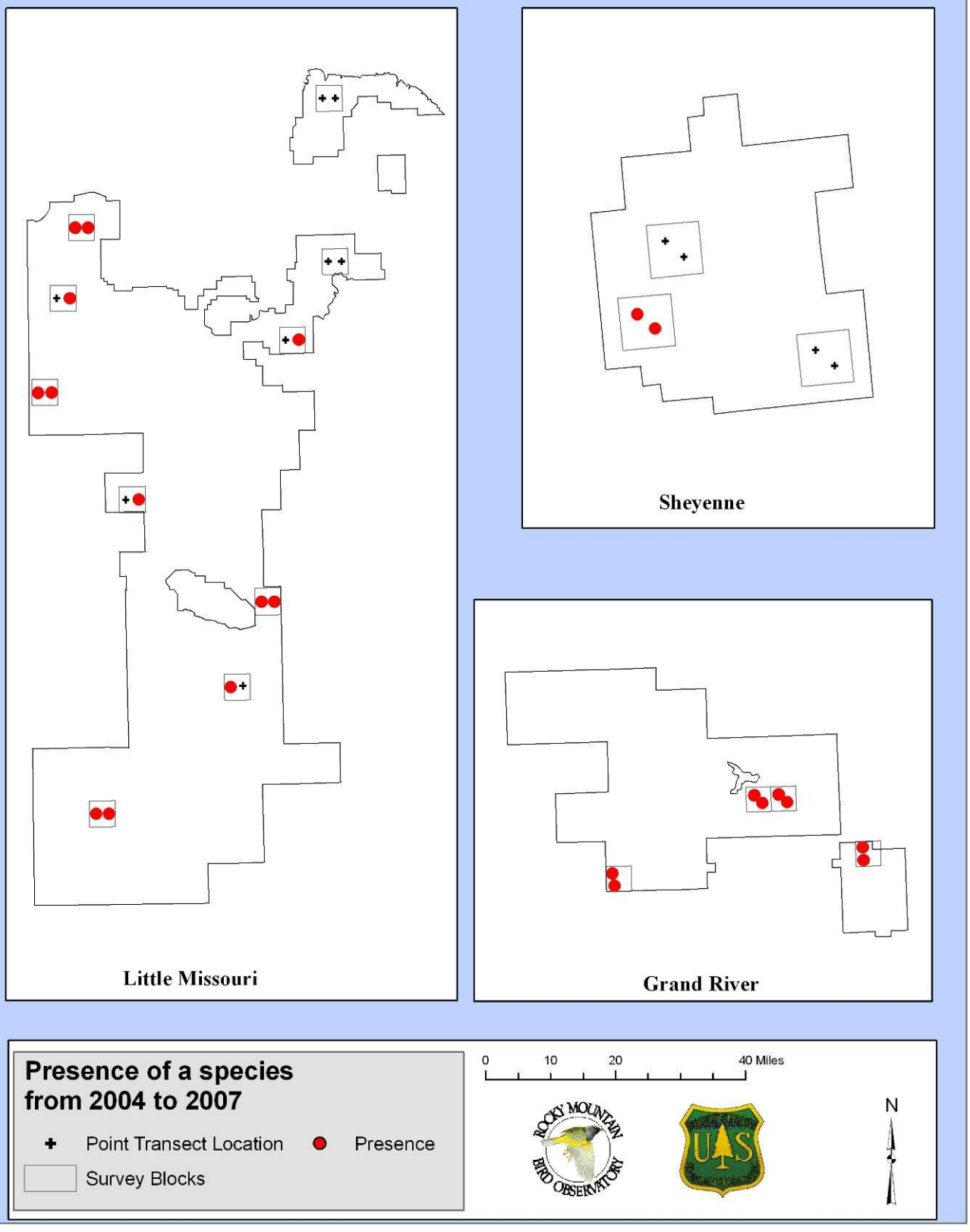



Say's Phoebe
Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
ROCKY MOUNTAIN
BIRD OBSERVATORY
N

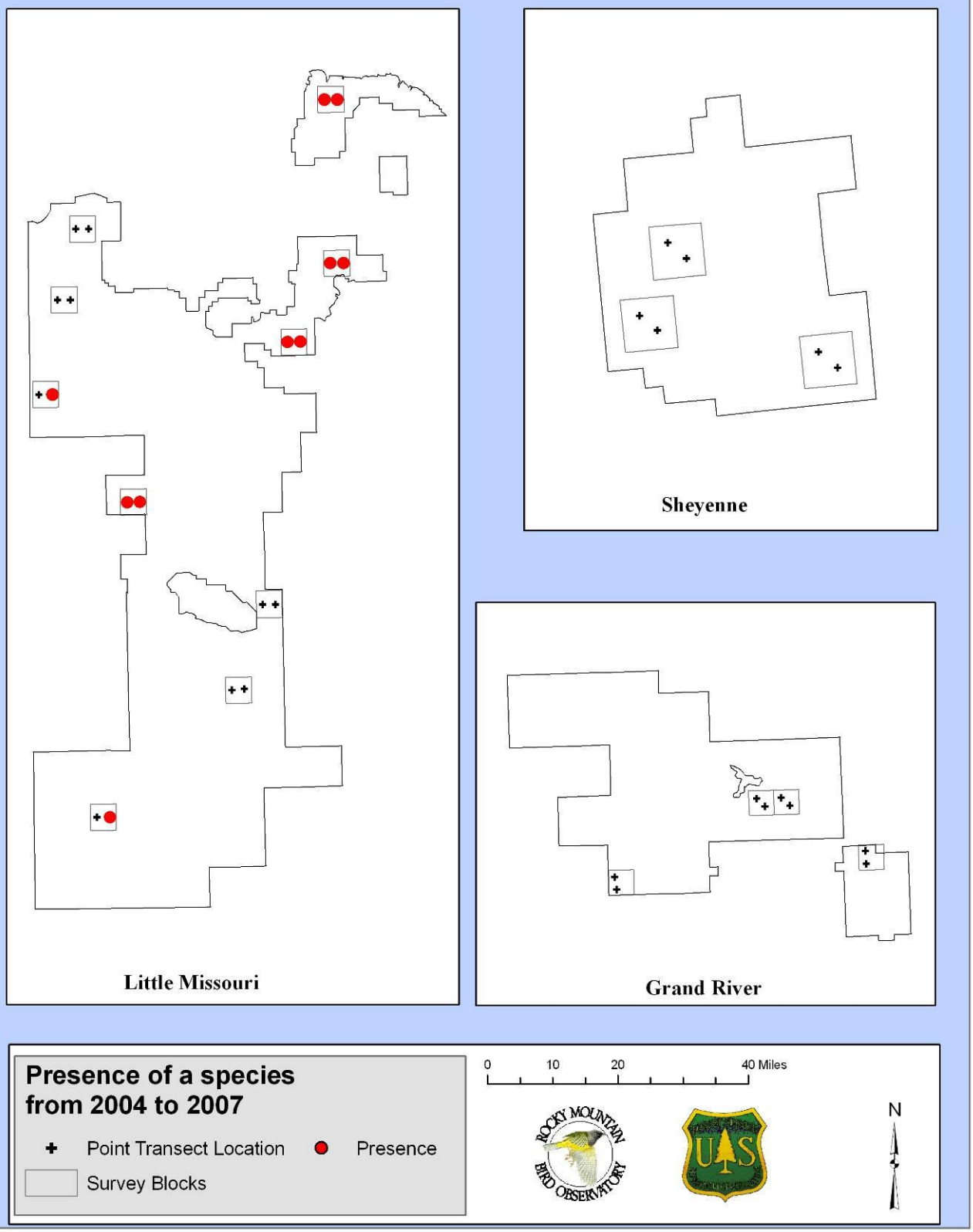
Eastern Kingbird

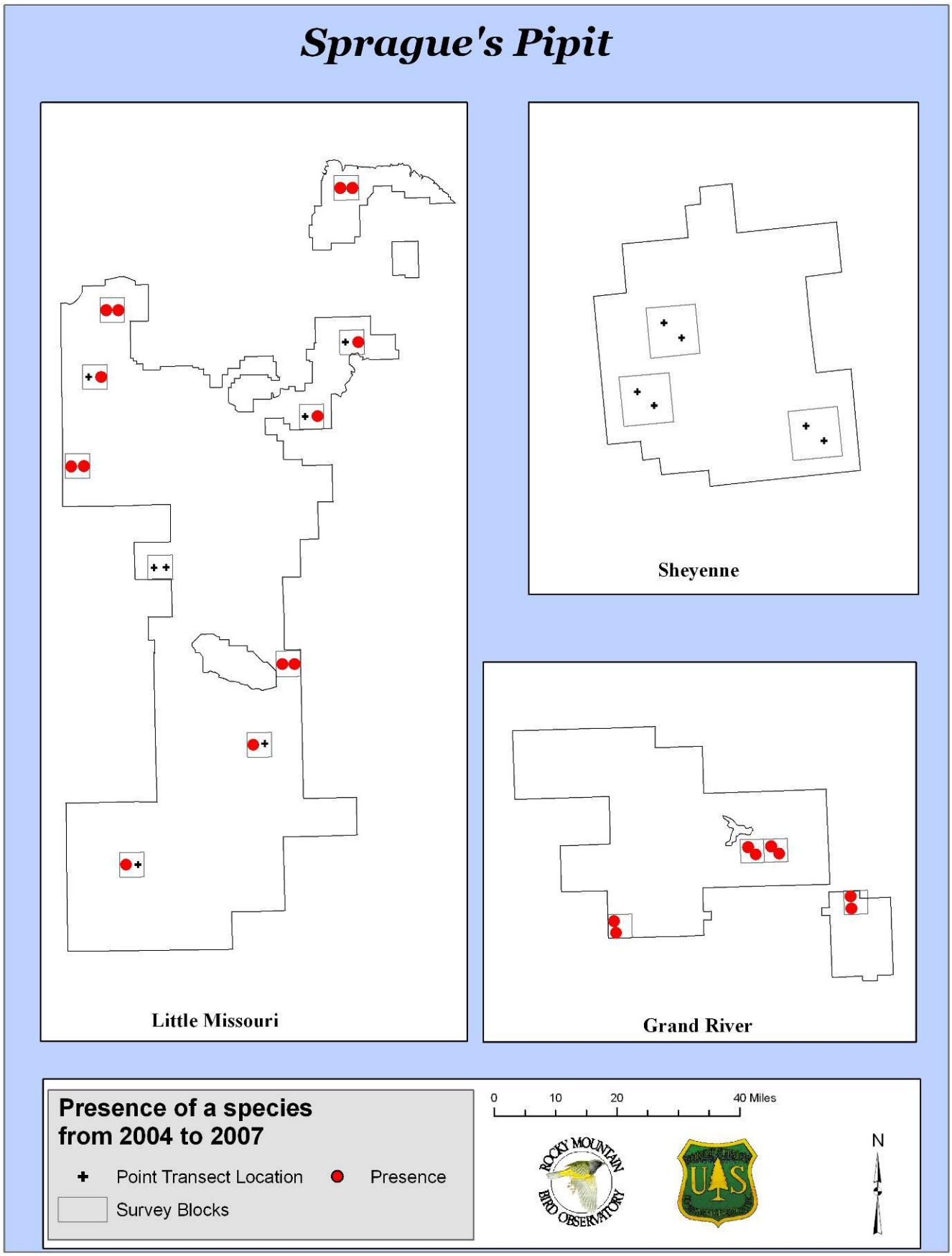


Horned Lark

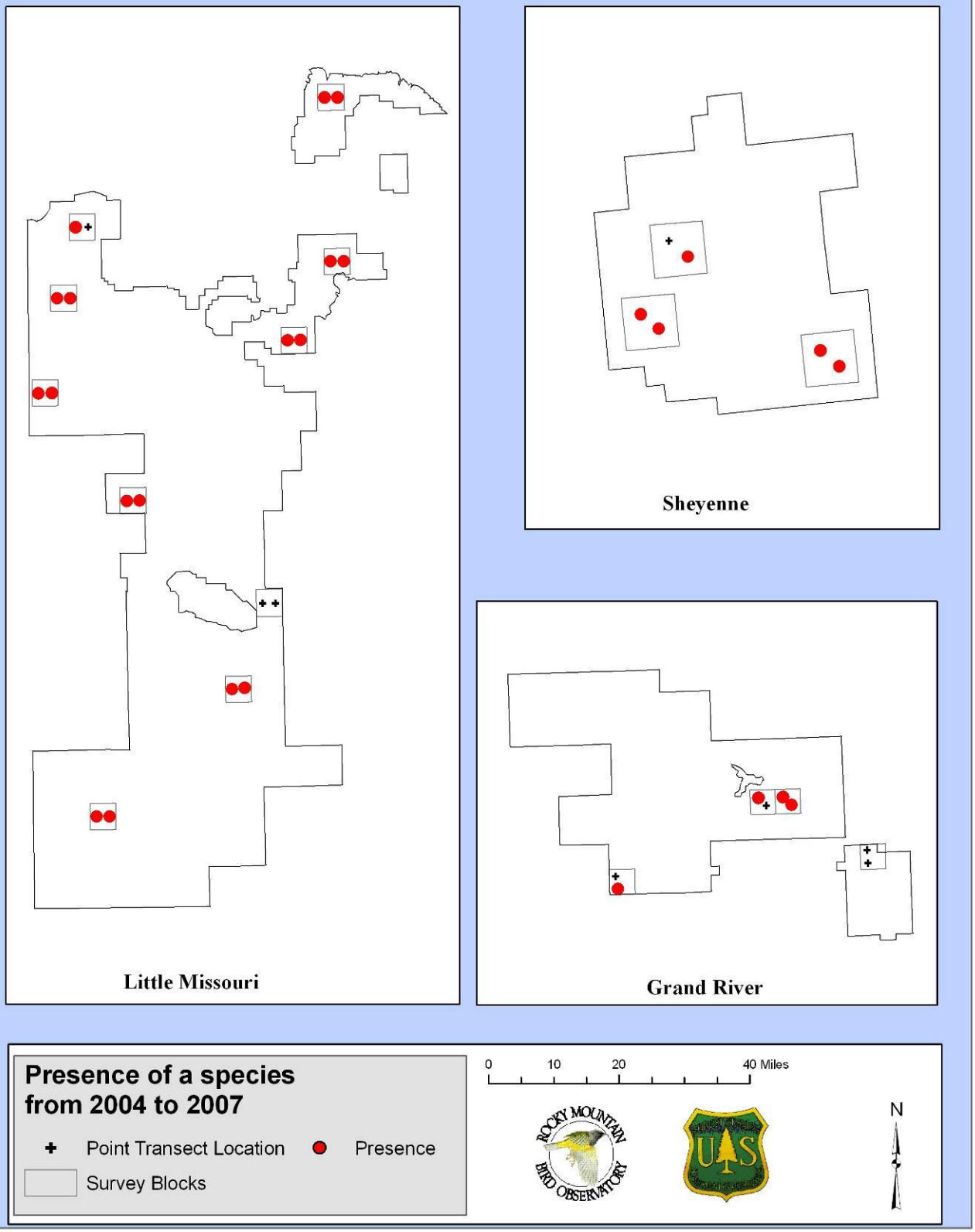

Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
ROCKY MOUNTAIN BIRD OBSERVATORY
N

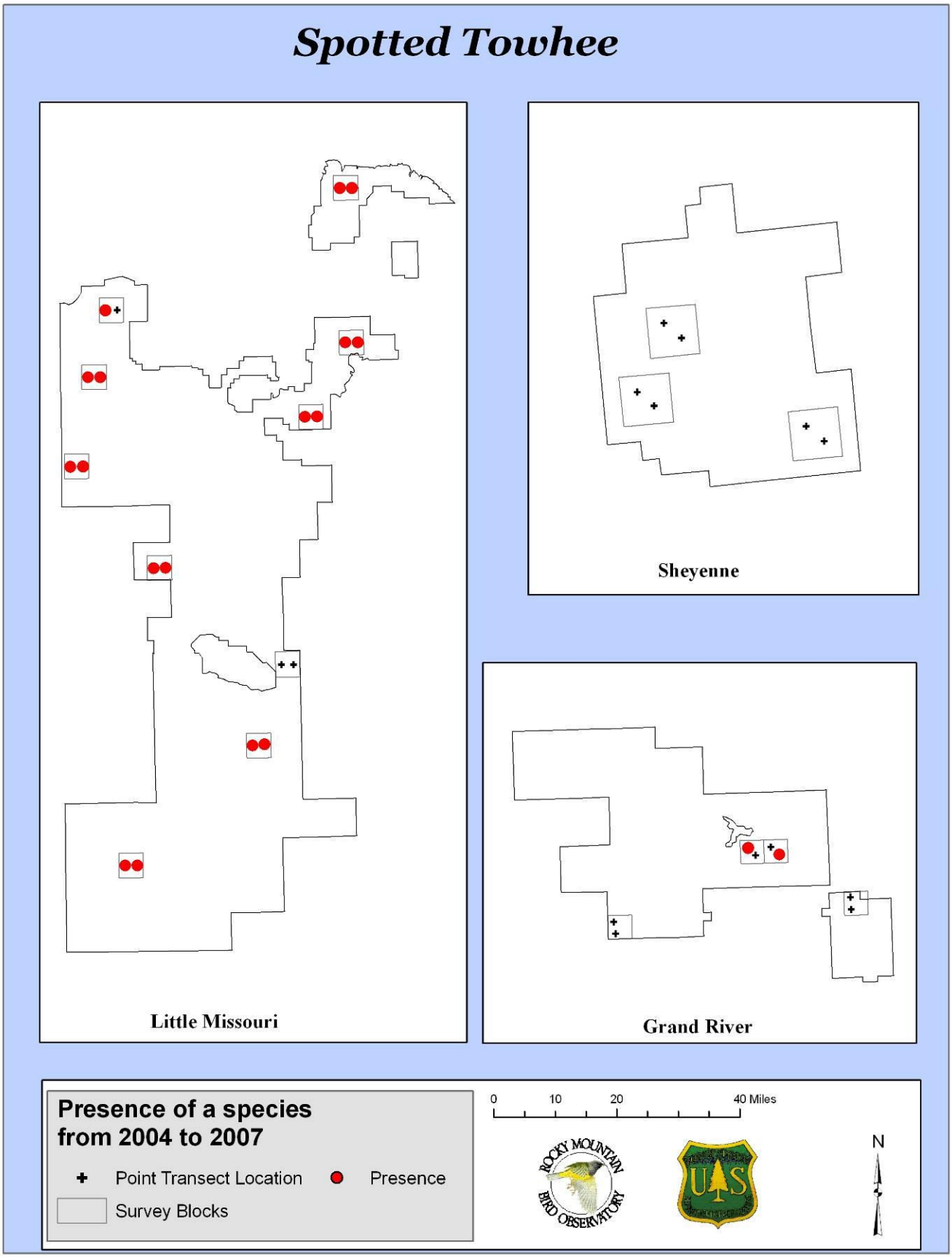
Mountain Bluebird



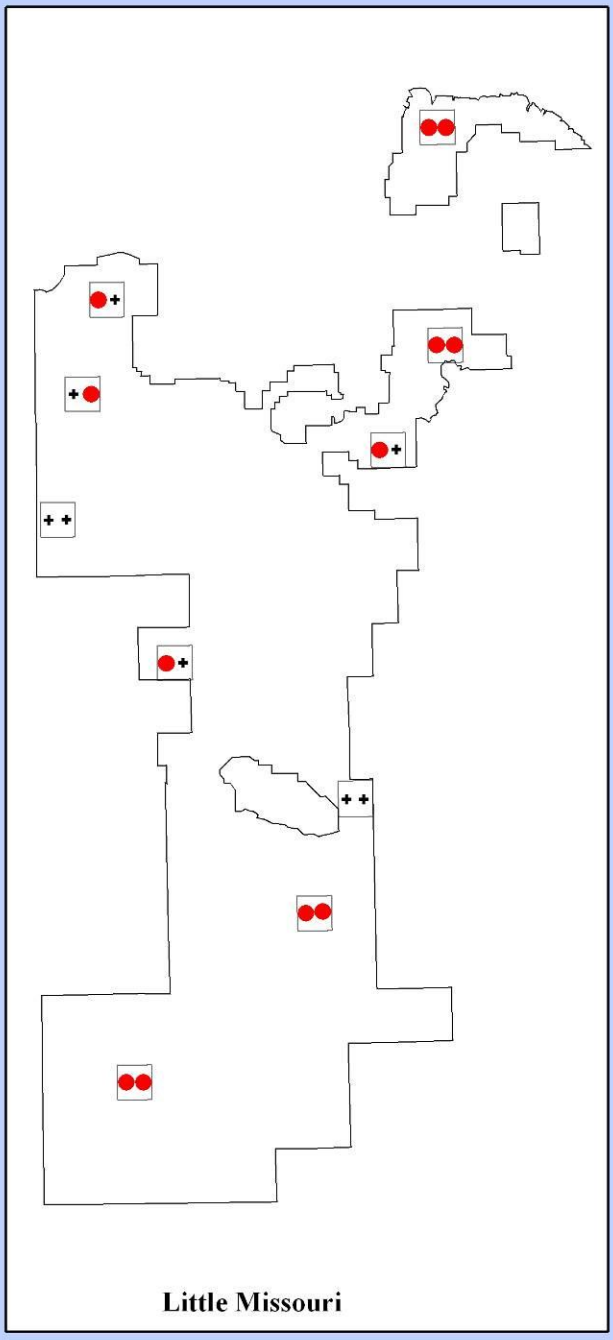

Sprague's Pipit
Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
N

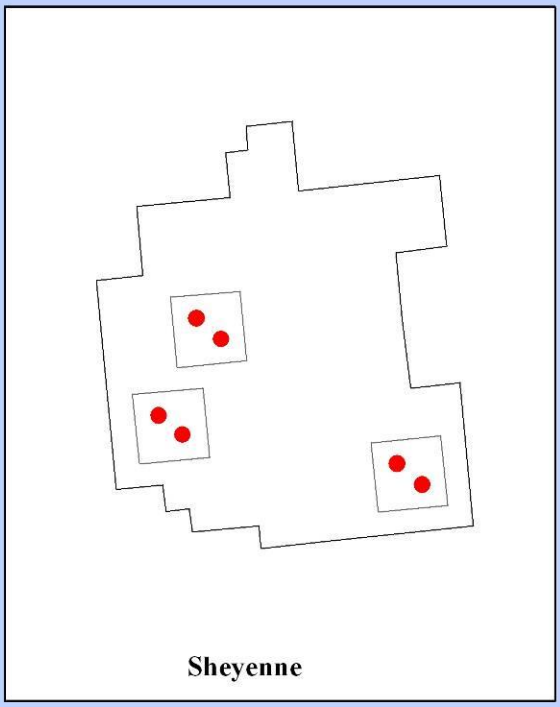
Yellow Warbler

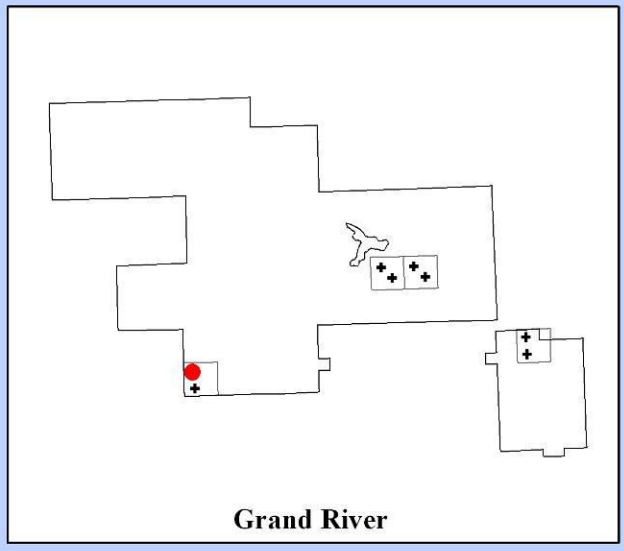



Spotted Towhee
Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
ROCKY MOUNTAIN
BIRD OBSERVATORY
N

Clay-colored Sparrow







Presence of a species from 2004 to 2007

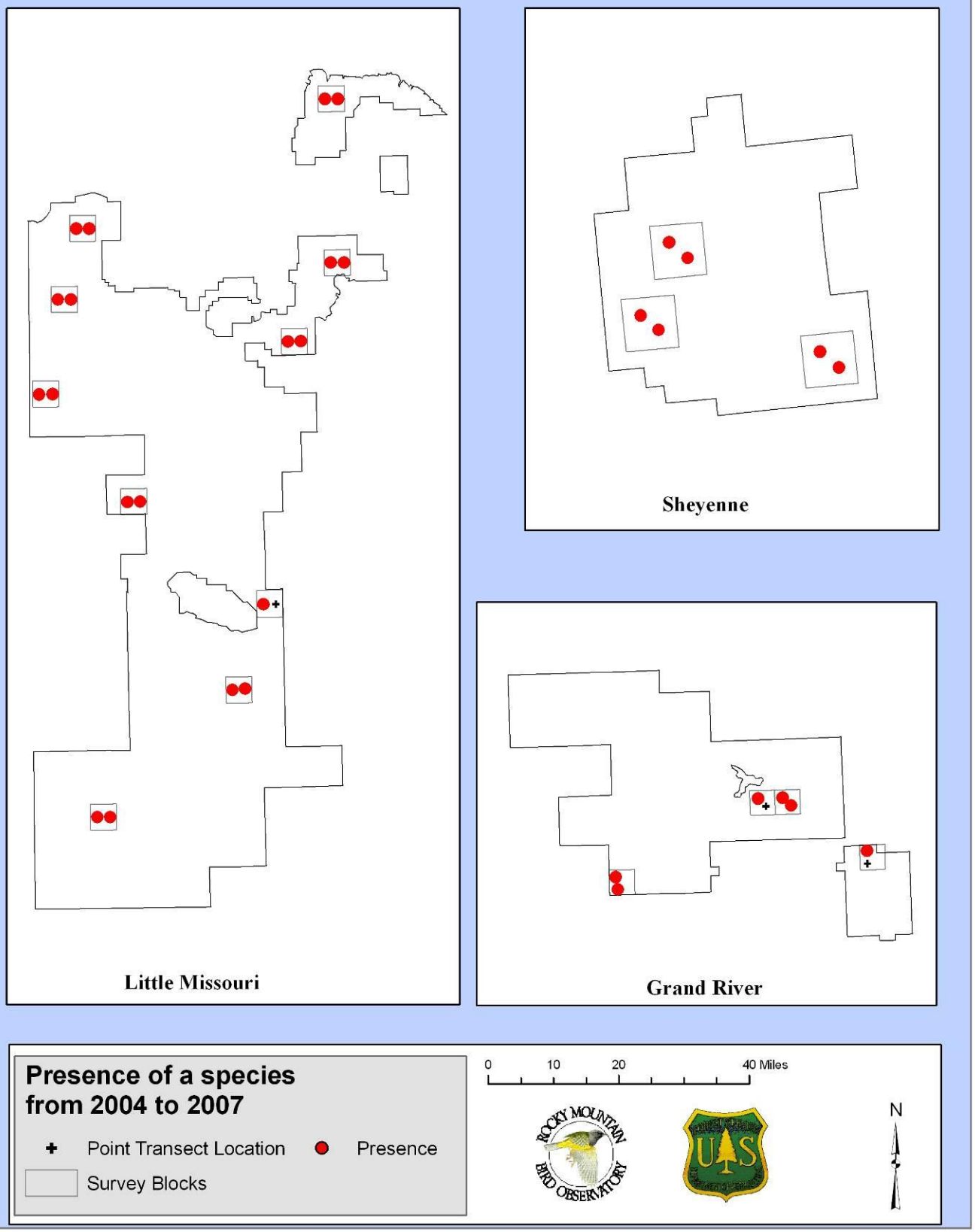
+ Point Transect Location
● Presence
Survey Blocks

0 10 20 40 Miles

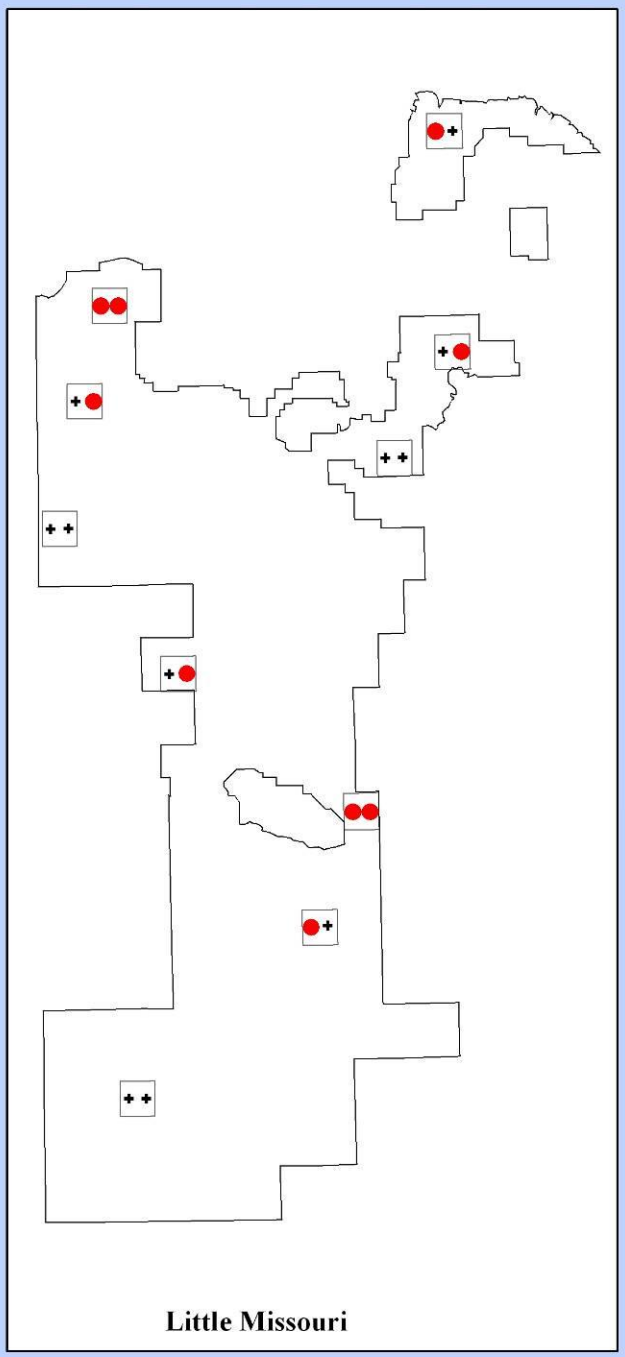
ROCKY MOUNTAIN BIRD OBSERVATORY

N

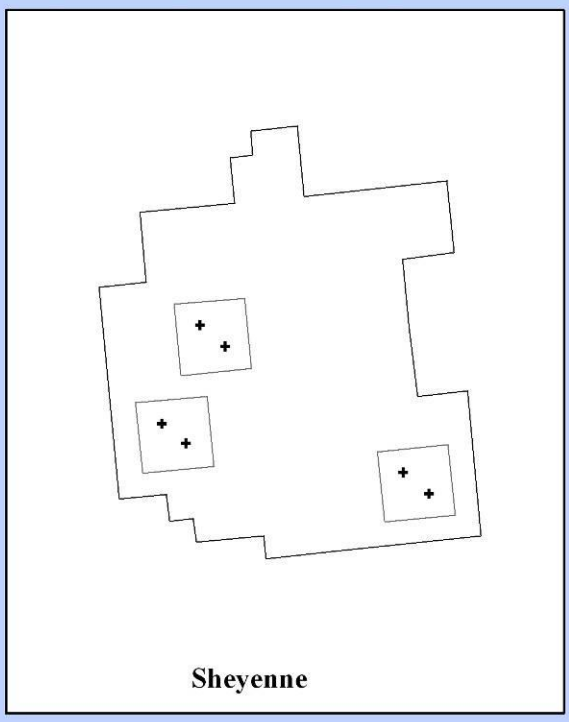
Vesper Sparrow



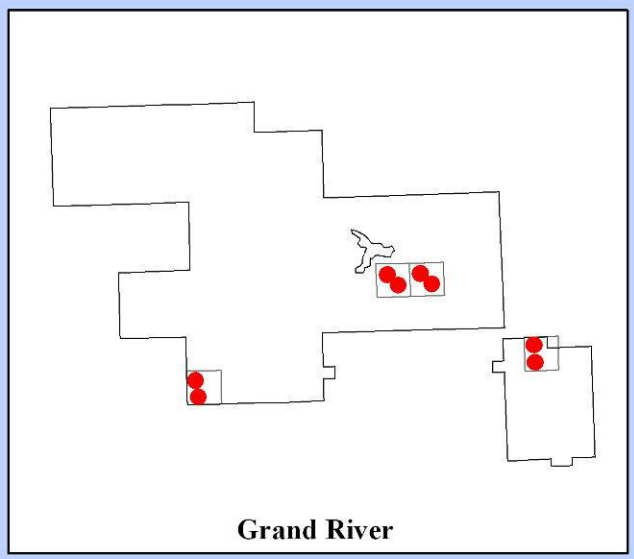
Lark Bunting



Little Missouri



Sheyenne



Grand River

Presence of a species from 2004 to 2007

+ Point Transect Location

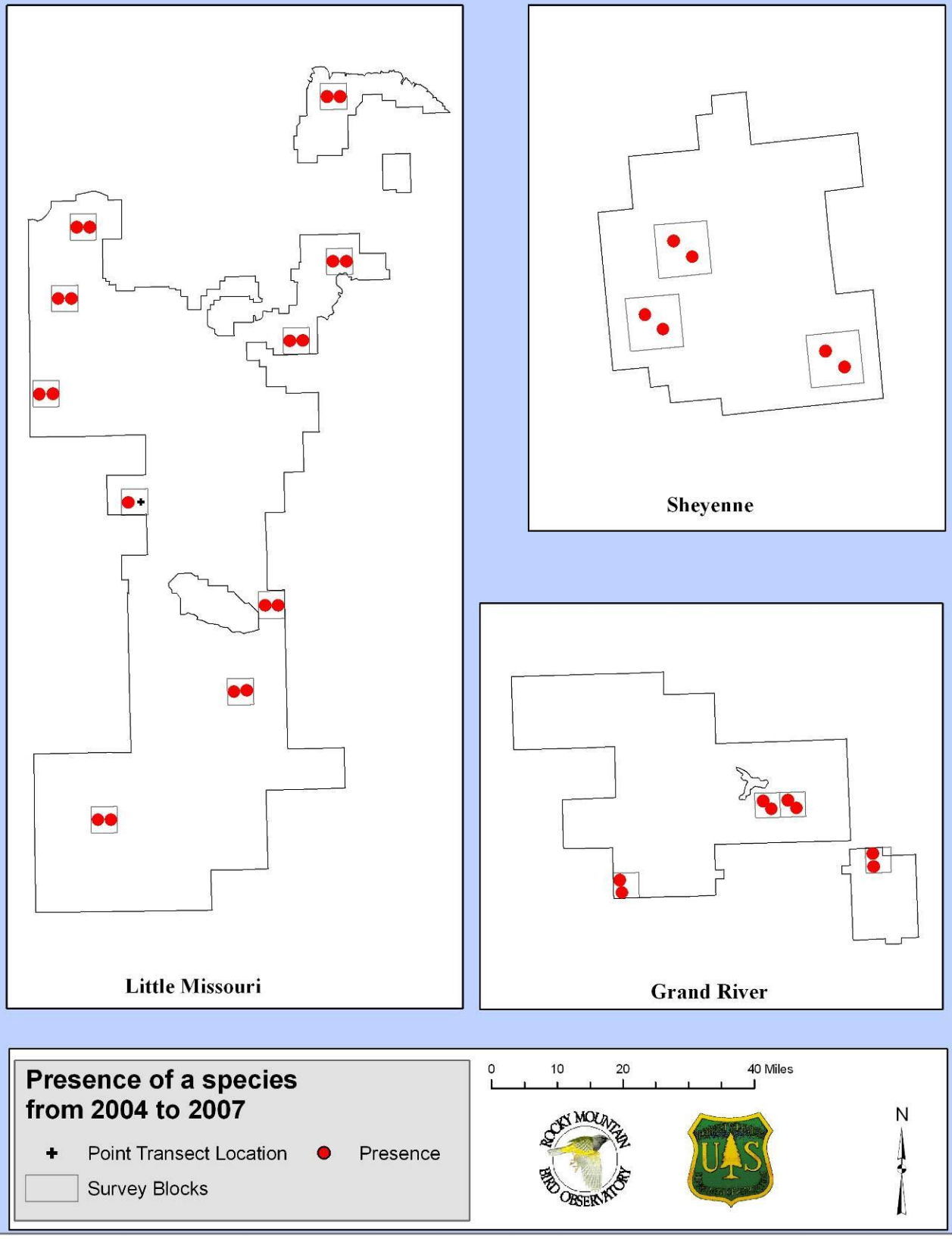
Presence

Survey Blocks

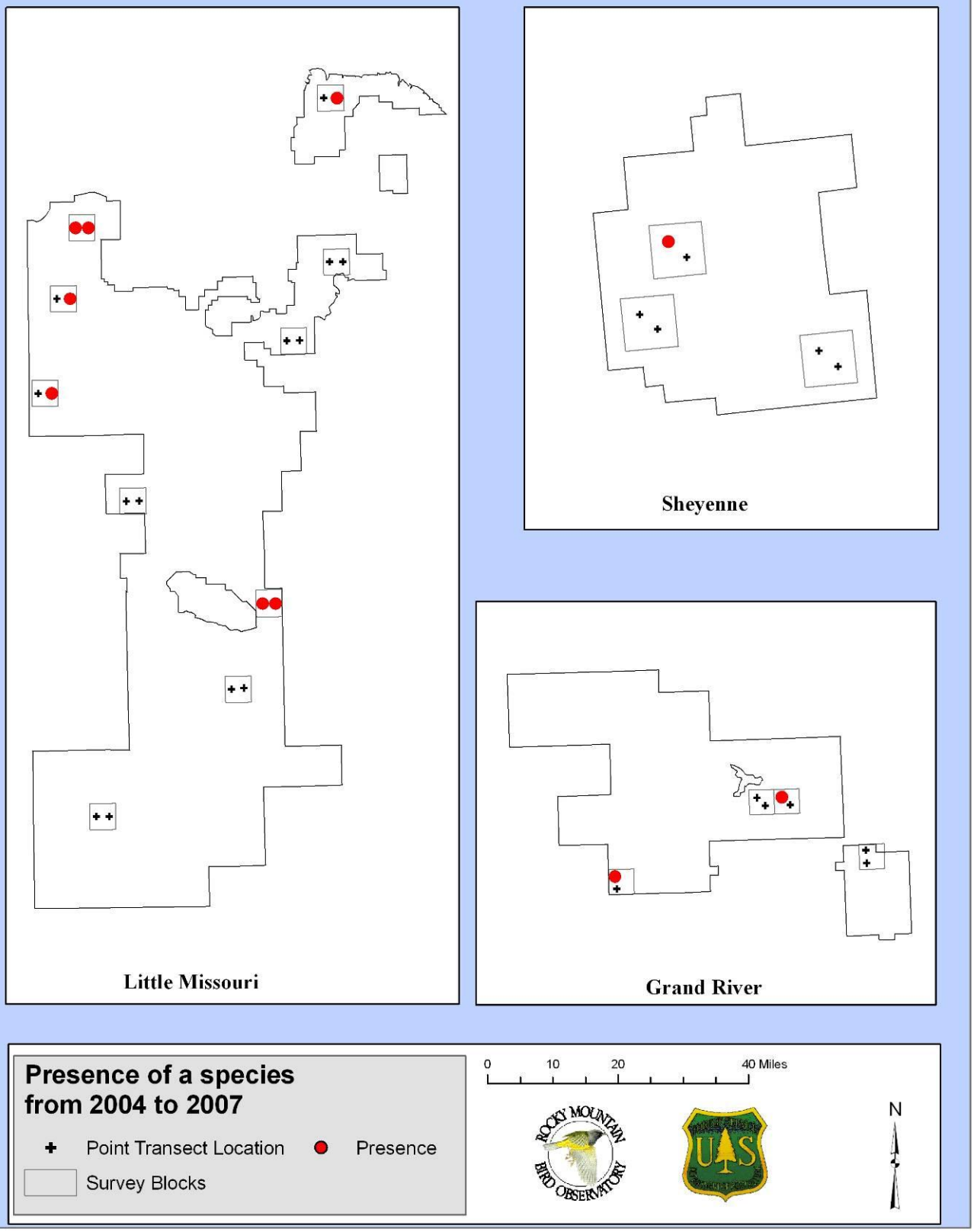
0 10 20 40 Miles

N

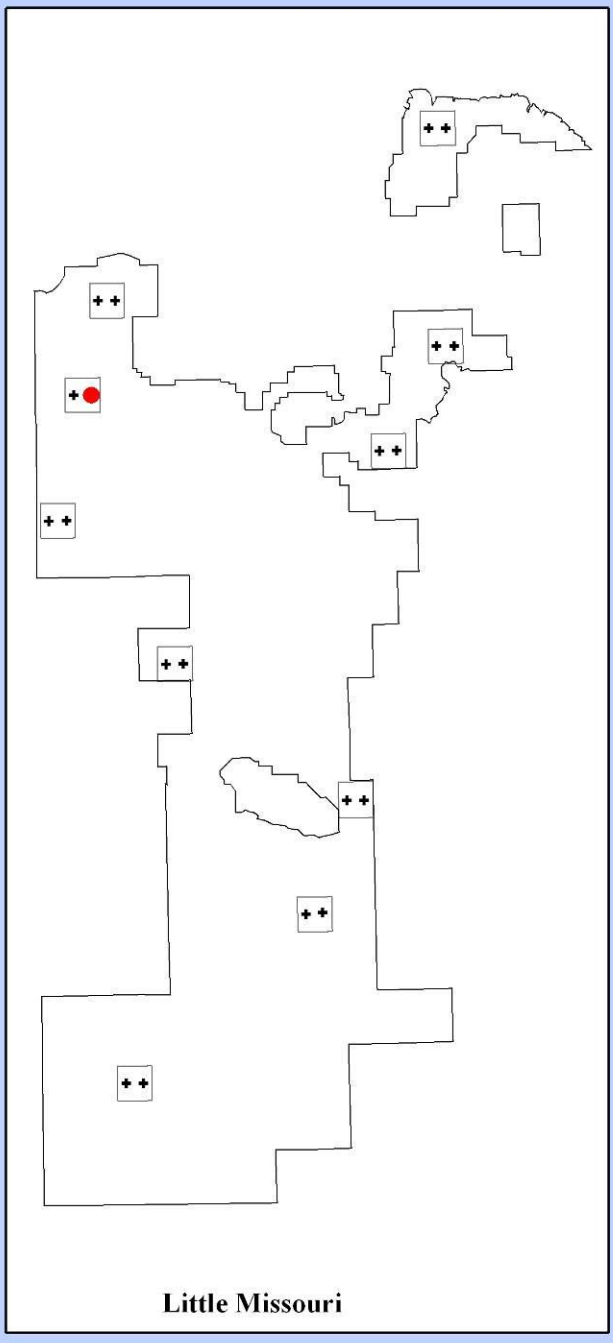
Grasshopper Sparrow

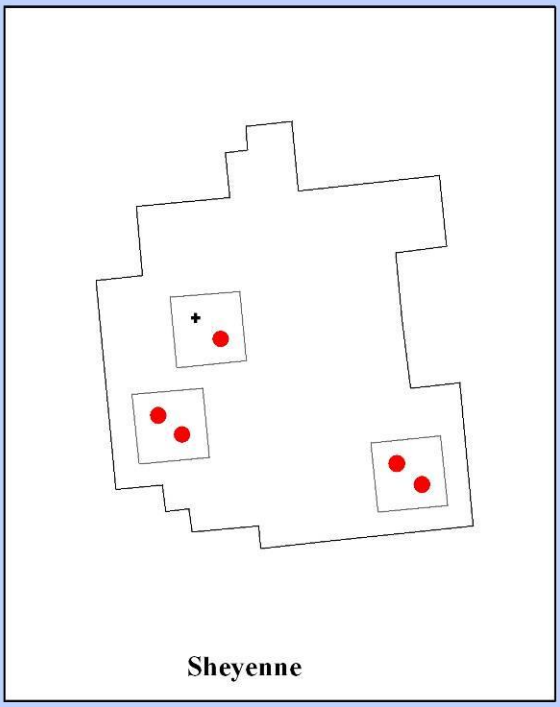


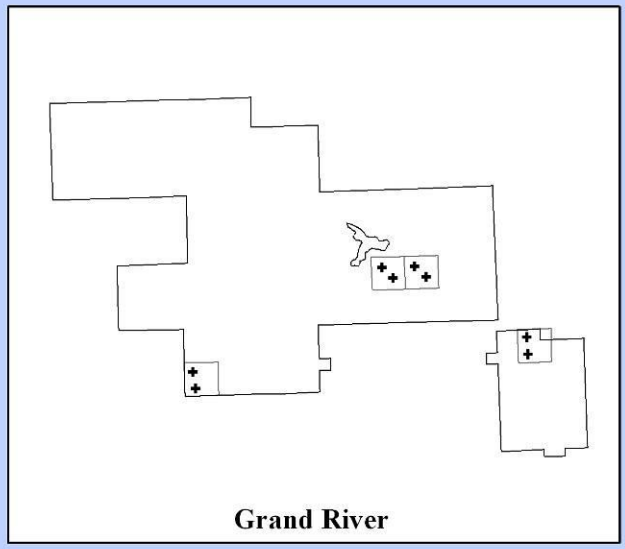
Baird's Sparrow



Le Conte's Sparrow







Presence of a species from 2004 to 2007

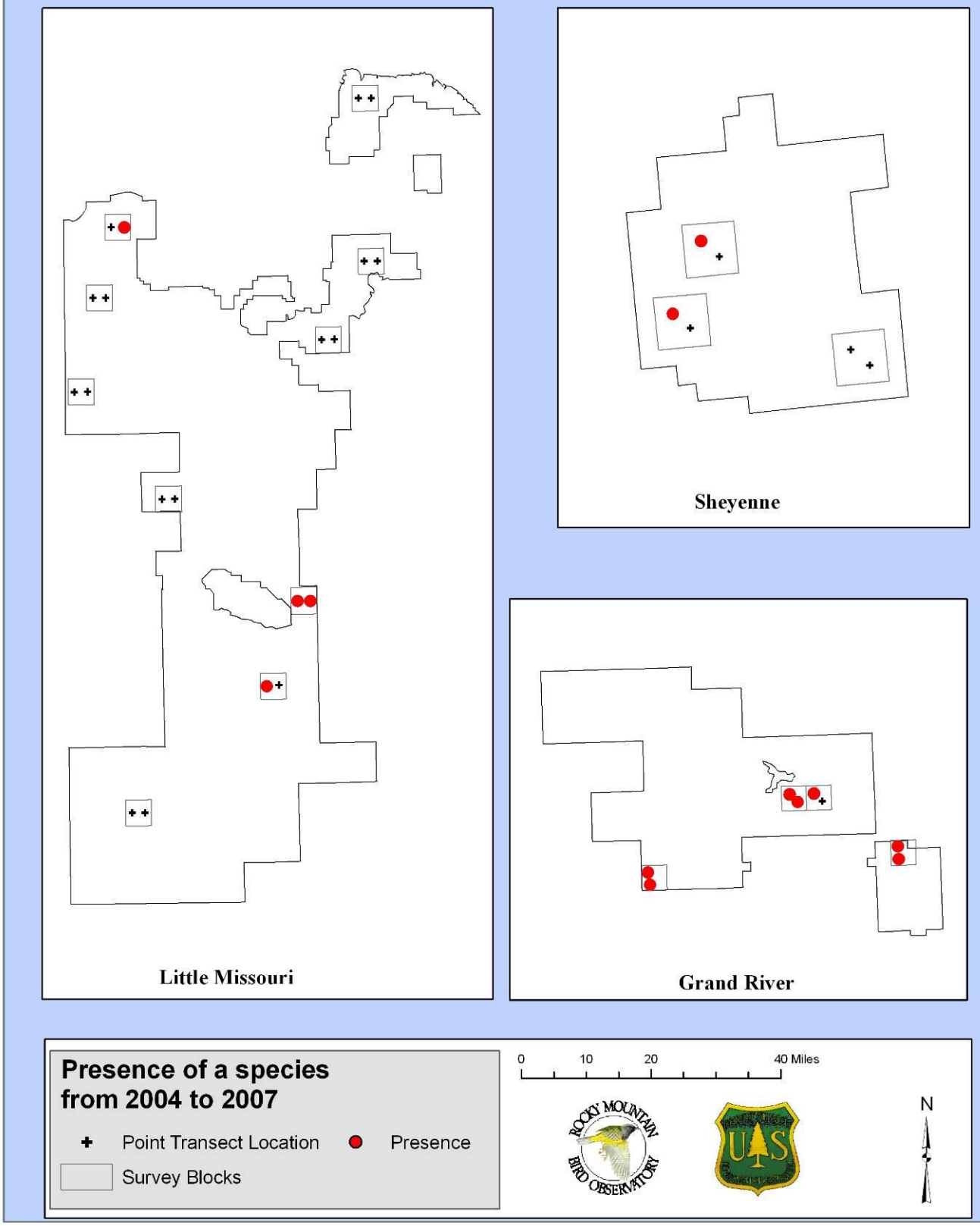
+ Point Transect Location
● Presence
Survey Blocks

0 10 20 40 Miles

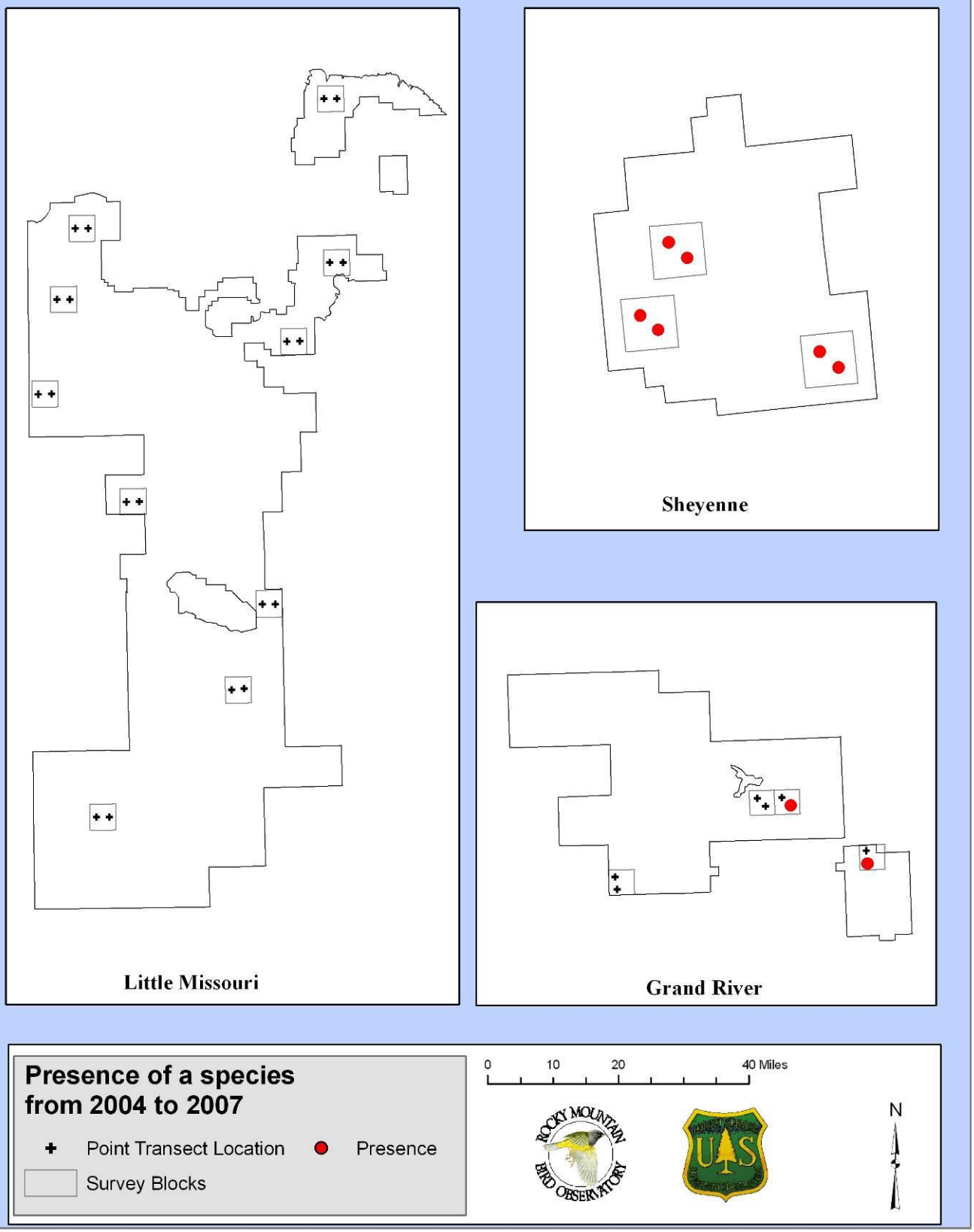
ROCKY MOUNTAIN BIRD OBSERVATORY

N

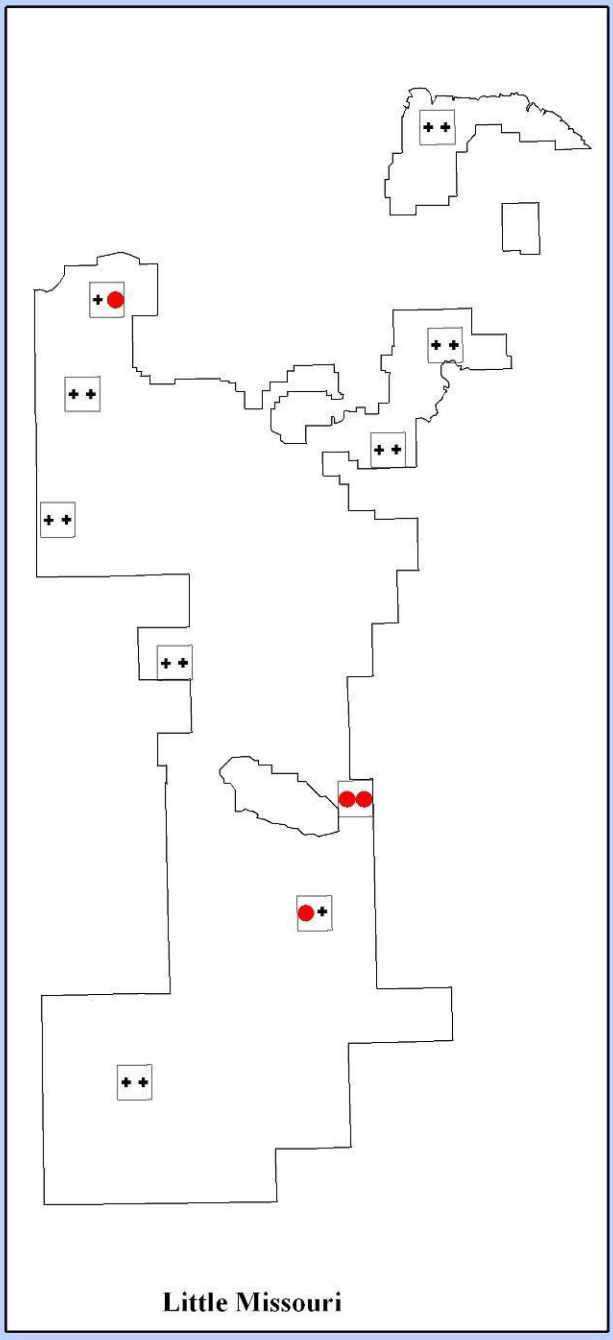
Chestnut-collared Longspur

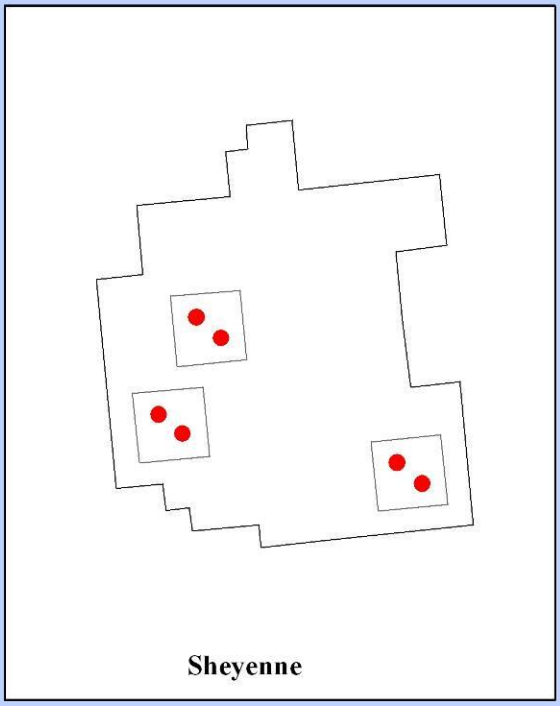


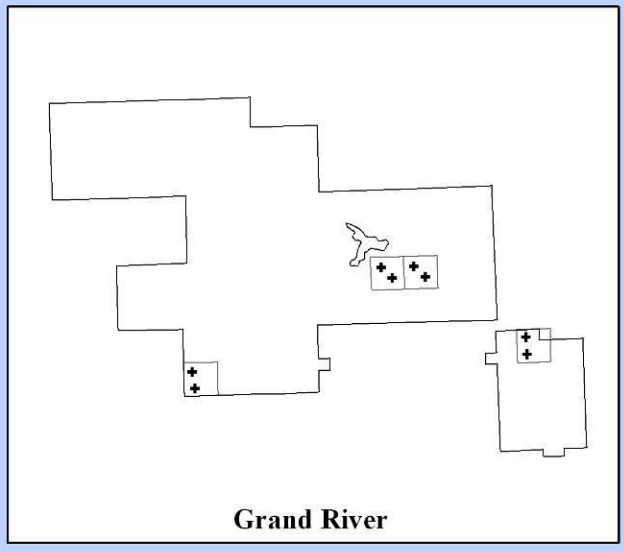
Dickcissel


Little Missouri
Sheyenne
Grand River
Presence of a species
from 2004 to 2007
Point Transect Location
Presence
Survey Blocks
0
10
20
40 Miles
ROCKY MOUNTAIN BIRD OBSERVATORY
N

Bobolink







Presence of a species from 2004 to 2007

+ Point Transect Location

Presence

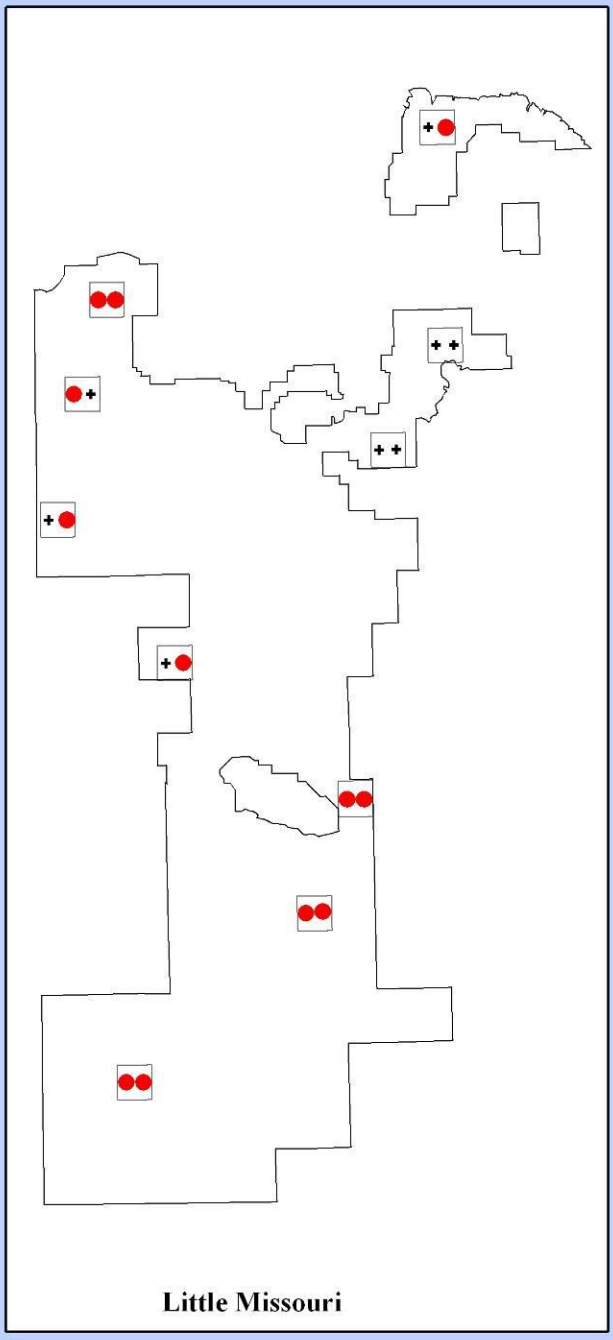
Survey Blocks

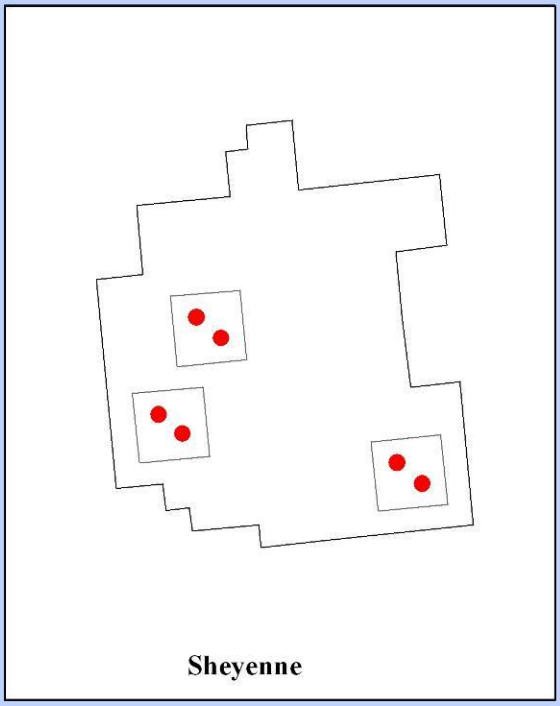
0 10 20 40 Miles

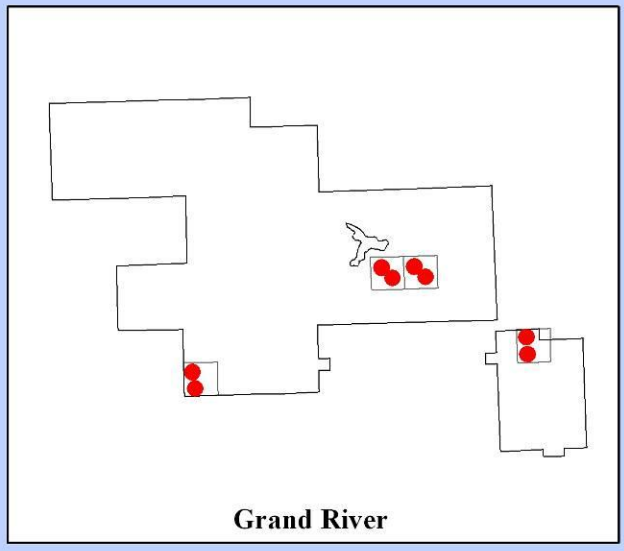
ROCKY MOUNTAIN BIRD OBSERVATORY

N

Red-winged Blackbird







Presence of a species from 2004 to 2007

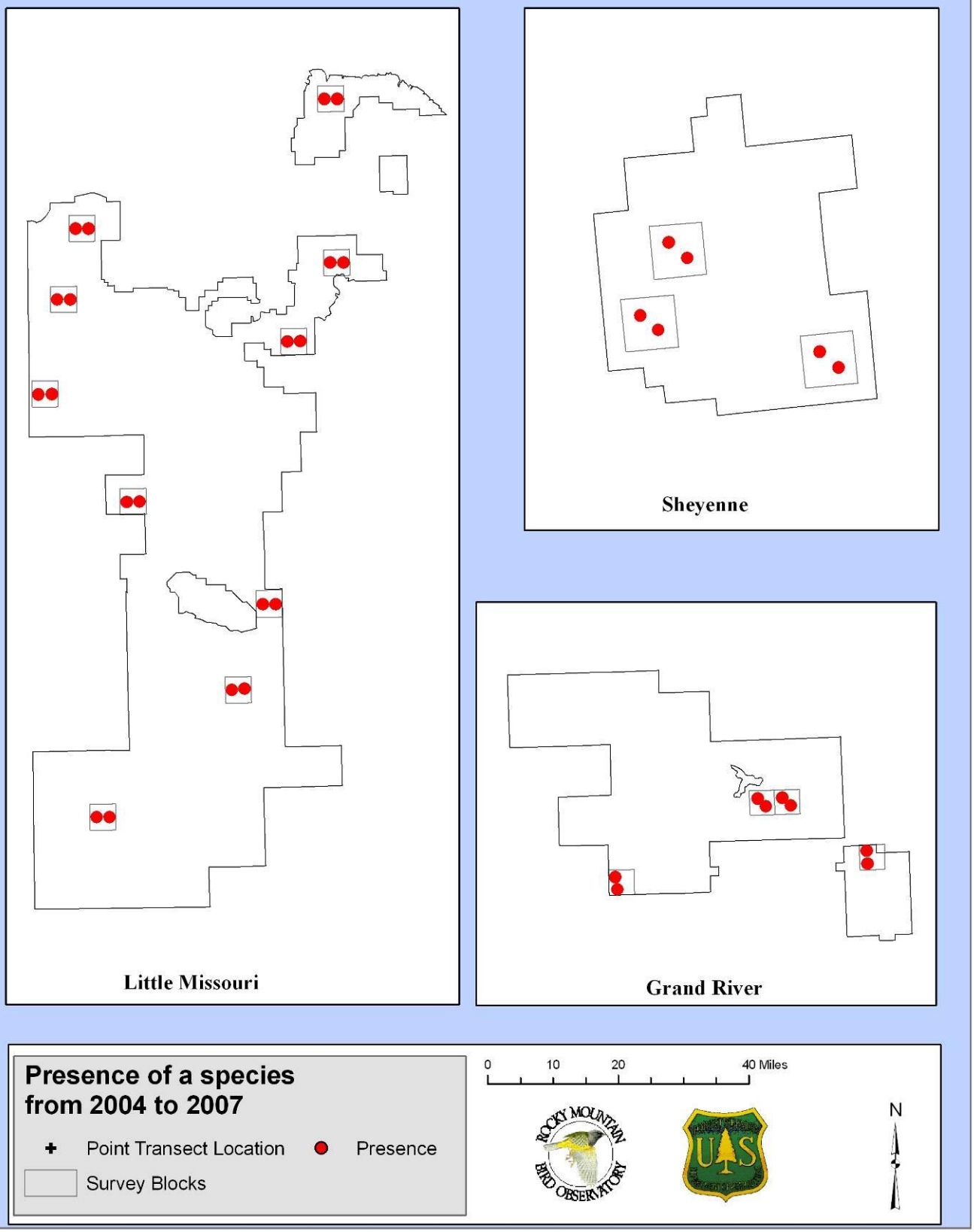
+ Point Transect Location
● Presence
Survey Blocks

0 10 20 40 Miles

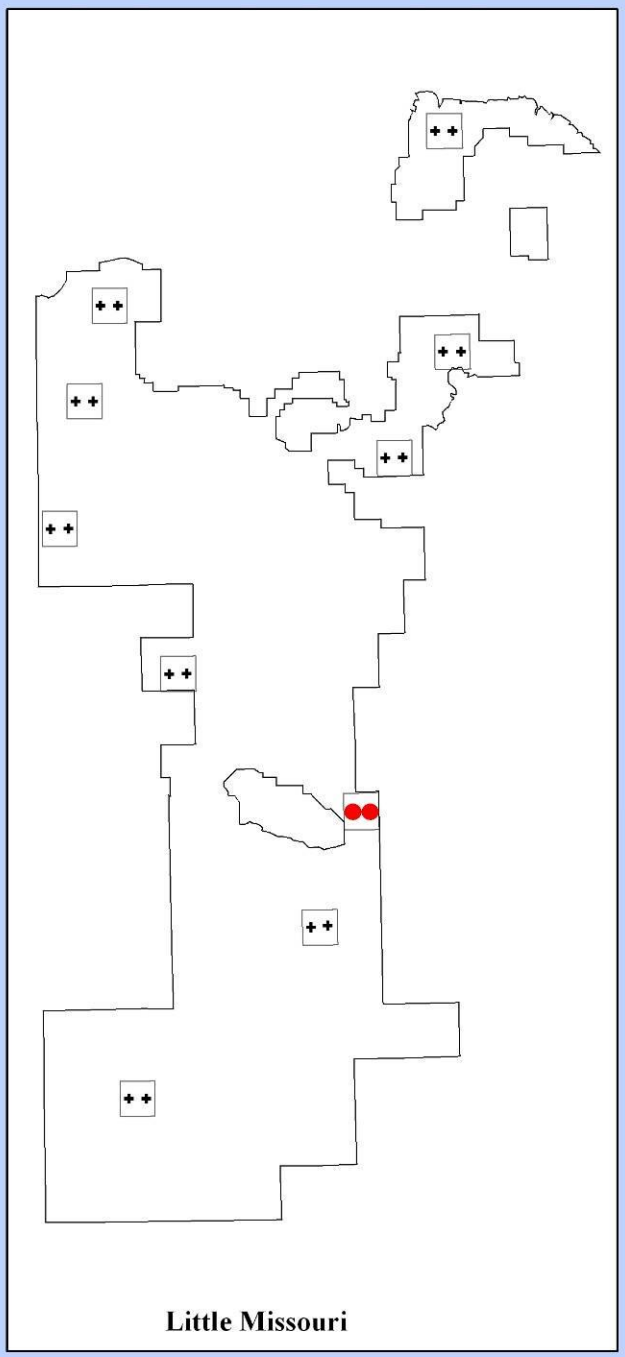
ROCKY MOUNTAIN BIRD OBSERVATORY

N

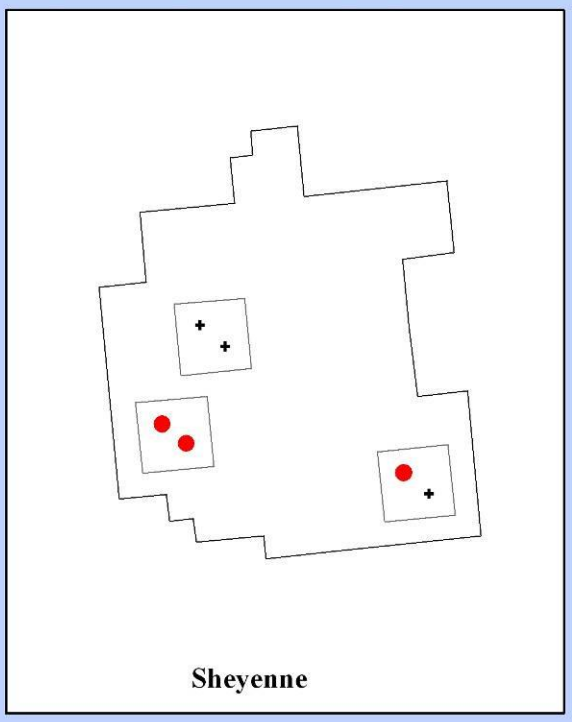
Western Meadowlark



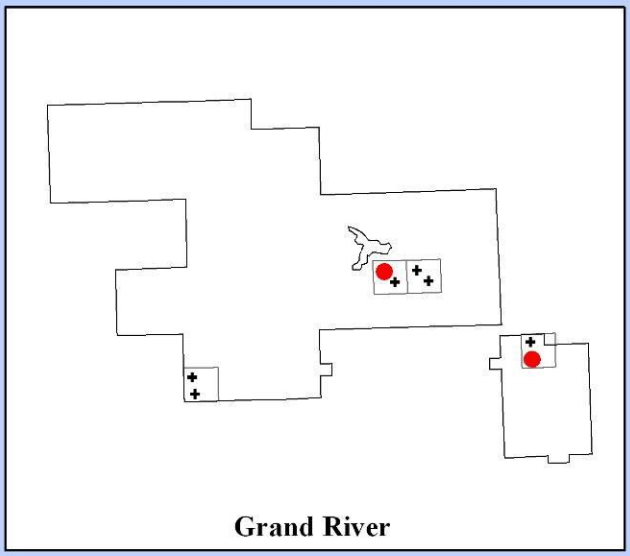
Yellow-headed Blackbird



Little Missouri



Sheyenne



Grand River

Presence of a species from 2004 to 2007

+ Point Transect Location

Presence

Survey Blocks

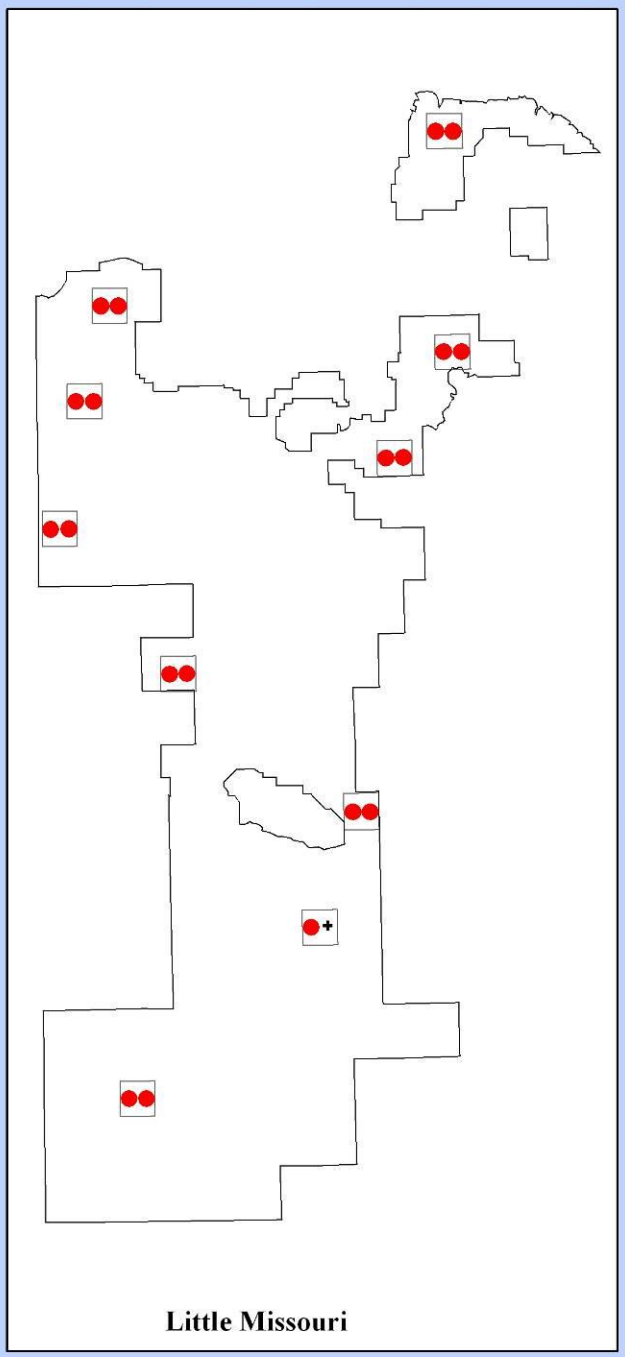
0 10 20 40 Miles

ROCKY MOUNTAIN BIRD OBSERVATORY

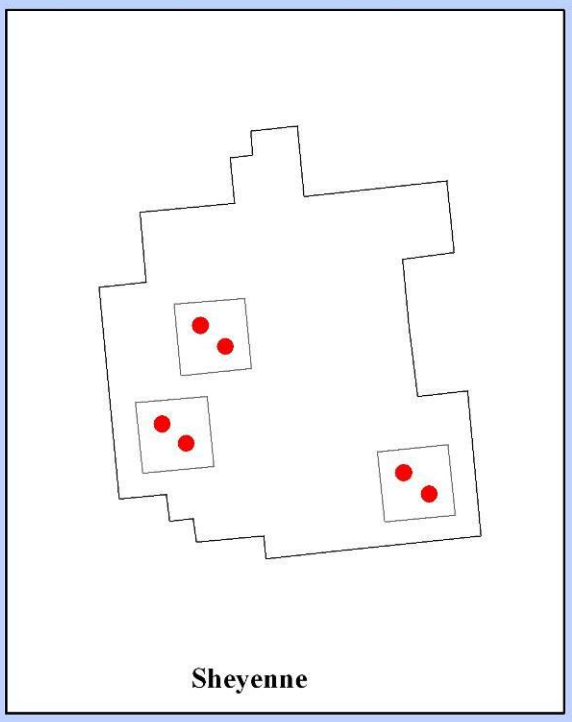
US

N

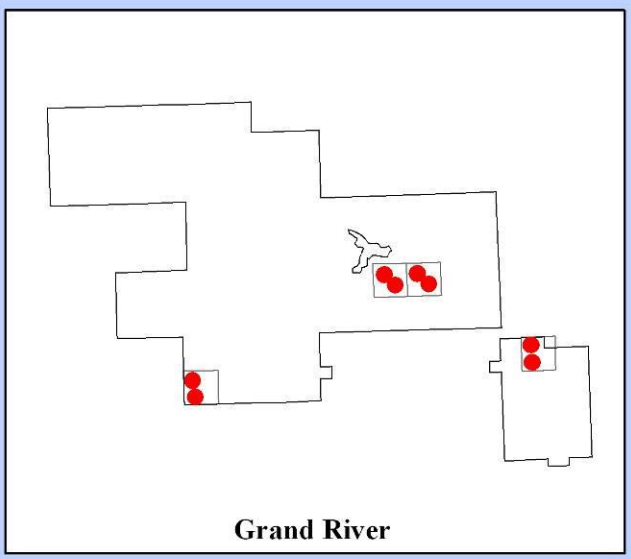
Brown-headed Cowbird



Little Missouri



Sheyenne



Grand River

Presence of a species from 2004 to 2007

+ Point Transect Location

Presence

Survey Blocks

0 10 20 40 Miles

N

APPENDIX B - Species List. A complete list of all species detected on Grand River, Little Missouri and Sheyenne National Grasslands with number of detections.

	Grand River				Total	Little Missouri				Total	Sheyenne				Total	Grand Total
Common Name	2004	2005	2006	2007		2004	2005	2006	2007		2004	2005	2006	2007		
Canada Goose	0	0	0	0	0	28	6	0	0	34	33	12	0	0	45	79
Wood Duck	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	2
Gadwall	4	0	2	4	10	2	4	0	4	10	0	4	0	1	5	25
American Wigeon	0	0	0	0	0	0	0	12	3	15	0	0	0	0	0	15
Mallard	3	0	0	4	7	5	0	1	1	7	0	3	1	4	8	22
Blue-winged Teal	2	2	2	0	6	7	1	2	0	10	0	0	0	4	4	20
Northern Shoveler	0	0	0	0	0	2	2	0	0	4	0	1	0	0	1	5
Northern Pintail	4	0	0	0	4	0	0	0	2	2	0	0	0	0	0	6
Canvasback	0	0	0	0	0	0	2	0	1	3	0	0	0	1	1	4
Lesser Scaup	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Common Merganser	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Ruddy Duck	0	0	0	0	0	0	2	3	1	6	0	0	0	0	0	6
Gray Partridge	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
Ring-necked Pheasant	5	0	0	17	22	12	4	0	6	22	2	5	9	21	37	81
Sharp-tailed Grouse	2	0	1	3	6	2	11	8	2	23	2	1	2	6	11	40
Wild Turkey	0	0	0	0	0	1	1	0	1	3	0	0	0	0	0	3
Pied-billed Grebe	0	0	0	0	0	2	0	2	0	4	0	0	0	0	0	4
Eared Grebe	0	0	0	0	0	0	21	6	0	27	0	0	0	0	0	27
American White Pelican	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
American Bittern	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Great Blue Heron	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Great Egret	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	10
Turkey Vulture	0	0	0	2	2	0	1	2	1	4	0	0	0	0	0	6
Northern Harrier	1	2	0	2	5	2	1	2	6	11	0	0	0	1	1	17

	Grand River				Total	Little Missouri				Total	Sheyenne				Total	Grand Total
Common Name	2004	2005	2006	2007		2004	2005	2006	2007		2004	2005	2006	2007		
Cooper's Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Swainson's Hawk	0	3	4	1	8	0	0	3	2	5	0	0	0	0	0	13
Red-tailed Hawk	0	2	0	0	2	5	12	6	3	26	1	1	6	3	11	39
Ferruginous Hawk	0	1	1	2	4	0	0	0	1	1	1	0	0	0	1	6
Golden Eagle	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
American Kestrel	0	1	1	0	2	0	1	7	8	16	1	2	2	3	8	26
Prairie Falcon	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
Sora	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
American Coot	0	0	0	0	0	15	0	3	1	19	0	0	0	1	1	20
Killdeer	5	5	25	15	50	2	11	12	13	38	1	8	5	14	28	116
Greater Yellowlegs	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Lesser Yellowlegs	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Solitary Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Willet	0	0	0	0	0	0	5	1	5	11	0	0	0	0	0	11
Spotted Sandpiper	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Upland Sandpiper	50	20	70	84	224	13	7	24	6	50	13	15	16	32	76	350
Marbled Godwit	0	0	3	0	3	2	4	0	2	8	3	12	0	0	15	26
Wilson's Snipe	0	0	0	0	0	1	3	1	0	5	1	6	5	31	43	48
Wilson's Phalarope	0	0	0	0	0	0	11	1	4	16	0	3	0	0	3	19
Ring-billed Gull	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Black Tern	0	0	0	0	0	0	1	0	1	2	0	1	11	17	29	31
Rock Pigeon	0	0	0	1	1	0	0	0	3	3	0	0	0	0	0	4
Mourning Dove	26	17	23	40	106	11	17	42	25	95	8	26	21	63	118	319
Black-billed Cuckoo	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Yellow-billed Cuckoo	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Great Horned Owl	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2
Northern Pygmy-Owl	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Burrowing Owl	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	2

	Grand River				Total	Little Missouri				Total	Sheyenne				Total	Grand Total
Common Name	2004	2005	2006	2007		2004	2005	2006	2007		2004	2005	2006	2007		
Short-eared Owl	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Common Nighthawk	6	1	3	3	13	6	2	16	0	24	2	0	0	9	11	48
Red-headed Woodpecker	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	3
Yellow-bellied Sapsucker	0	0	0	0	0	0	0	0	0	0	0	1	0	9	10	10
Downy Woodpecker	0	0	1	0	1	0	0	1	1	2	0	1	9	3	13	16
Hairy Woodpecker	0	0	0	0	0	0	0	0	1	1	1	1	0	2	4	5
Northern Flicker	3	4	4	6	17	3	4	24	12	43	2	4	16	0	22	82
Pileated Woodpecker	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Western Wood-Pewee	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
Eastern Wood-Pewee	0	0	0	0	0	1	0	0	0	1	2	1	2	6	11	12
Willow Flycatcher	0	0	3	1	4	0	0	1	0	1	6	0	0	3	9	14
Least Flycatcher	2	0	0	1	3	1	3	0	1	5	6	7	4	15	32	40
Eastern Phoebe	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Say's Phoebe	0	0	0	2	2	3	3	0	0	6	0	0	0	0	0	8
Cassin's Kingbird	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Western Kingbird	6	2	5	13	26	4	12	6	4	26	0	2	0	1	3	55
Eastern Kingbird	14	2	4	20	40	14	7	16	14	51	5	26	18	25	74	165
Loggerhead Shrike	0	1	0	1	2	2	0	1	0	3	0	0	0	0	0	5
Warbling Vireo	0	0	0	0	0	1	0	0	1	2	0	6	0	18	24	26
Red-eyed Vireo	0	0	0	0	0	7	18	18	14	57	0	1	0	0	1	58
Blue Jay	0	0	0	0	0	0	0	0	0	0	0	3	3	2	8	8
Black-billed Magpie	0	0	0	2	2	1	2	2	5	10	0	0	0	0	0	12
American Crow	0	0	0	0	0	11	33	20	24	88	0	3	1	7	11	99
Common Raven	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
Horned Lark	23	36	79	135	273	7	19	42	29	97	0	0	2	2	4	374
Tree Swallow	0	0	0	0	0	0	1	0	0	1	2	1	0	4	7	8
Northern Rough-winged Swallow	1	4	4	3	12	6	0	0	7	13	0	1	0	0	1	26
Bank Swallow	0	1	2	0	3	0	0	0	0	0	0	0	0	1	1	4

	Grand River				Total	Little Missouri				Total	Sheyenne				Total	Grand Total
Common Name	2004	2005	2006	2007		2004	2005	2006	2007		2004	2005	2006	2007		
Cliff Swallow	1	0	4	0	5	0	0	2	0	2	0	1	2	6	9	16
Barn Swallow	1	0	0	1	2	2	9	12	10	33	0	0	0	18	18	53
Black-capped Chickadee	0	0	0	0	0	2	3	22	3	30	0	0	1	2	3	33
White-breasted Nuthatch	0	0	0	0	0	0	0	0	1	1	0	0	0	3	3	4
Rock Wren	0	5	4	8	17	5	5	16	7	33	0	0	0	0	0	50
Bewick's Wren	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	6
House Wren	0	0	1	4	5	10	21	52	29	112	2	1	12	27	42	159
Sedge Wren	0	0	0	0	0	0	0	0	0	0	0	0	47	78	125	125
Marsh Wren	0	0	0	0	0	0	0	0	0	0	0	0	3	17	20	20
Eastern Bluebird	0	0	0	0	0	6	1	1	0	8	1	0	5	2	8	16
Western Bluebird	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Mountain Bluebird	0	0	0	0	0	7	11	35	6	59	0	0	0	0	0	59
Swainson's Thrush	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
American Robin	0	0	2	3	5	2	13	0	8	23	3	3	3	14	23	51
Gray Catbird	0	0	0	0	0	0	2	6	1	9	0	0	0	4	4	13
Sage Thrasher	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Brown Thrasher	1	0	2	4	7	0	0	5	2	7	1	2	6	1	10	24
European Starling	0	0	1	4	5	3	1	0	1	5	0	1	0	5	6	16
Sprague's Pipit	6	38	10	8	62	24	87	16	53	180	0	0	0	0	0	242
Cedar Waxwing	0	0	0	0	0	2	11	0	7	20	0	15	0	8	23	43
Yellow Warbler	1	0	9	7	17	31	55	60	45	191	7	8	6	5	26	234
Black-and-white Warbler	0	0	0	0	0	3	5	10	2	20	0	0	0	0	0	20
American Redstart	0	0	0	0	0	3	5	4	5	17	0	0	0	0	0	17
Ovenbird	0	0	0	0	0	6	18	12	3	39	2	0	0	0	2	41
Northern Waterthrush	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Common Yellowthroat	0	0	1	0	1	4	4	4	0	12	13	22	39	48	122	135
Yellow-breasted Chat	0	0	0	0	0	19	27	63	51	160	0	1	1	1	3	163
Spotted Towhee	0	0	1	2	3	60	55	183	101	399	0	0	0	0	0	402

	Grand River				Total	Little Missouri				Total	Sheyenne				Total	Grand Total
Common Name	2004	2005	2006	2007		2004	2005	2006	2007		2004	2005	2006	2007		
Cassin's Sparrow	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
American Tree Sparrow	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
Chipping Sparrow	0	3	0	0	3	5	14	21	6	46	0	1	1	3	5	54
Clay-colored Sparrow	0	0	0	1	1	0	23	21	6	50	21	36	25	60	142	193
Brewer's Sparrow	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	2
Field Sparrow	1	0	0	5	6	9	64	112	102	287	5	1	5	10	21	314
Vesper Sparrow	5	4	0	9	18	39	104	168	102	413	1	2	12	13	28	459
Lark Sparrow	3	0	0	3	6	9	4	26	42	81	0	0	4	3	7	94
Sage Sparrow	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Lark Bunting	37	96	57	160	350	27	15	9	2	53	0	0	0	0	0	403
Savannah Sparrow	0	0	0	0	0	5	13	4	12	34	9	9	13	15	46	80
Grasshopper Sparrow	36	85	58	92	271	94	183	170	154	601	38	98	40	55	231	1103
Baird's Sparrow	0	2	0	0	2	12	4	11	29	56	0	1	0	0	1	59
Henslow's Sparrow	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Le Conte's Sparrow	0	0	0	0	0	1	0	0	0	1	0	0	0	28	28	29
Song Sparrow	0	0	0	0	0	0	0	0	0	0	1	2	5	15	23	23
Chestnut-collared Longspur	11	16	9	90	126	7	0	30	2	39	0	1	0	1	2	167
Rose-breasted Grosbeak	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Black-headed Grosbeak	0	0	0	1	1	5	2	1	2	10	1	0	0	0	1	12
Lazuli Bunting	0	5	0	0	5	3	4	5	19	31	1	0	0	0	1	37
Indigo Bunting	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Dickcissel	0	0	0	2	2	0	0	0	0	0	1	0	34	7	42	44
Bobolink	0	0	0	0	0	4	1	14	20	39	12	42	17	34	105	144
Red-winged Blackbird	16	15	10	17	58	12	10	20	23	65	33	38	93	116	280	403
Eastern Meadowlark	0	0	0	0	0	0	0	0	0	0	0	32	0	0	32	32
Western Meadowlark	143	133	269	198	743	165	326	356	200	1047	35	97	82	79	293	2083
Yellow-headed Blackbird	0	0	2	1	3	4	1	10	3	18	0	0	7	7	14	35
Brewer's Blackbird	0	0	0	0	0	2	1	0	8	11	0	10	3	13	26	37

	Grand River				Total	Little Missouri				Total	Sheyenne				Total	Grand Total
Common Name	2004	2005	2006	2007		2004	2005	2006	2007		2004	2005	2006	2007		
Common Grackle	1	0	1	16	18	4	0	37	0	41	0	5	1	59	65	124
Brown-headed Cowbird	103	28	171	106	408	45	32	111	38	226	34	19	54	50	157	791
Orchard Oriole	0	0	0	5	5	0	0	0	2	2	0	2	0	17	19	26
Bullock's Oriole	0	0	0	0	0	0	0	2	0	2	3	0	0	0	3	5
Baltimore Oriole	0	0	0	1	1	0	0	0	0	0	2	4	0	0	6	7
Pine Siskin	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
American Goldfinch	3	1	3	1	8	8	11	9	20	48	0	5	12	33	50	106
	527	537	852	1113	3029	839	1386	1928	1348	5501	320	622	683	1184	2809	11350