

FINAL PERFORMANCE REPORT



Federal Aid Grant No. F06AF00008 (T-33-P-1)

**Development of the Shortgrass Prairie Region Species of Greatest
Conservation Need Conservation Assessment and Conservation
Strategy**

Oklahoma Department of Wildlife Conservation

April 1, 2006 through March 31, 2014

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State: Oklahoma

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ABSTRACT The Oklahoma Comprehensive Wildlife Conservation Strategy (OCWCS) identified the Shortgrass Prairie Region as one of the six Regions within the State at which Species of Greatest Conservation Need (SGCN) management will take place. A regional Conservation Assessment and Conservation Strategy (CACS) process is needed in order to develop meaningful actions that will address the conservation needs of SGCN as a whole, as well as the habitats upon which they rely. Existing habitat and region specific species of greatest conservation need (SGCN) population information was compiled (Table 1). Based on this compilation we determined to implement monitoring programs for those species where baseline data had already been collected and verified. Surveys for Swift Fox (*Vulpes velox*), Black-tailed Prairie Dog (*Cynomys ludovicianus*), Burrowing Owl (*Athene cunicularia*) and breeding shortgrass prairie birds were conducted. The Oklahoma Department of Wildlife Conservation (ODWC) established a Research Section that designed a geodatabase initially focusing on the Shortgrass Prairie Region due to the imminent listing of the Lesser Prairie-Chicken as a federally-listed threatened species. Data layers were created within a GIS framework of vegetation communities, identifying and prioritizing cores areas of habitat and corridors that need to be connected in order to provide complete conservation areas for the LEPC. Landowner incentive and cost-share habitat programs for Black-tailed Prairie Dogs and other SGCN have enrolled thousands of acres for habitat conservation work and/or protection. With over 90% of the Shortgrass Prairie Region under private ownership the success of these landowner programs is critical to restoring and protecting shortgrass prairie for SGCN. The recommended Conservation Strategy provided in this report for SGCN addresses the Shortgrass Prairie Region as a whole with strong emphasis toward private landowner involvement.

OBJECTIVE: Develop a Conservation Assessment and Conservation Strategy for species of greatest conservation need and their associated habitats within the Shortgrass Prairie Region, as defined in the Oklahoma Comprehensive Wildlife Conservation Strategy.

INTRODUCTION

The Shortgrass Prairie region is often referred to as the High Plains. In Oklahoma, it encompasses the panhandle counties and the northwestern corner of the main body of the state, and includes portions of Cimarron, Texas, Beaver, Harper, Woodward and Ellis counties. It is equivalent to a combination of the Southern High Plains, Arkansas Tablelands and the Texas High Plains sections in Bailey's ecological classification system; and to the Western High Plains and a portion of the Southwestern Tablelands under Omernick's ecoregion classification system. Figure 1 displays the 6 regions of Oklahoma as identified by the Oklahoma Comprehensive Wildlife Conservation Strategy (CWCS) with the Shortgrass Prairie Region highlighted.

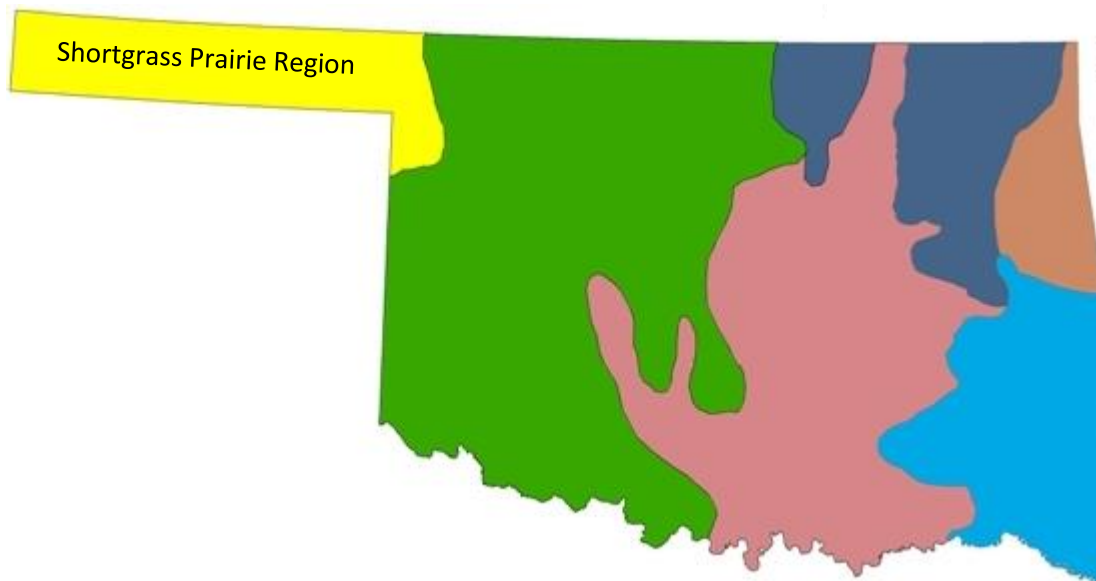


Figure 1. Map of Regions of Oklahoma from the Oklahoma Comprehensive Wildlife Conservation Strategy with Shortgrass Prairie identified.

The CWCS identifies nine Conservation Landscapes within the Shortgrass Prairie Region of Oklahoma. Approximately 91% of the Region is comprised of the Shortgrass Prairie habitat where it is widespread and often forms the matrix within which other habitats occur. As much as 747,399 acres of Shortgrass Prairie may remain in Oklahoma, but this is less than half of what occurred historically. Much of the original Shortgrass Prairie has been converted to crop production, particularly dryland wheat or irrigated corn, soybeans or alfalfa. Many crop fields have been enrolled in the Conservation Reserve Program (CRP) during the past 20 years because of potential for

soil loss due to wind erosion. Unfortunately most of the CRP acreage has been planted to exotic grasses such as Yellow (Old World) Bluestem (*Bothriochloa ischaemum*) or Mixed-grass Prairie species such as Little Bluestem (*Schizachyrium scoparium*) instead of to native Shortgrass Prairie species.

Within the CWCS Shortgrass Prairie Region, the most reoccurring Conservation Issue identified is “inadequate data concerning species of greatest conservation need and habitat, an impediment for effective conservation planning and implementation“. Further, though data has been collected on some individual species within the Shortgrass Prairie Region, this data has not been compiled into a single conservation assessment which makes developing meaningful action to address Species of Greatest Conservation Need (SGCN) more difficult. This project attempts to identify key SGCN within the Shortgrass Prairie Region and compile existing information into a single conservation assessment for these species as a whole. This assessment should provide a better understanding of the limiting factors affecting these species which should result in the development of a management strategy that would potentially benefit the Shortgrass Prairie habitat as a whole.

RESULTS

The project began with compiling existing habitat and region specific species of greatest conservation need (SGCN) population information. This effort included conducting literature review and conservation assessment of SGCN in the shortgrass prairie region. Table 1 shows the results of the compilation, providing a guideline to determine what, if any information is still needed for each species. (A Key to Source information is provided in Appendix 1.) Based on this effort, as well as evaluating personnel time available after an in-house reorganization of the Wildlife Diversity Program, 2 mammal SGCN and 1 bird SGCN were selected, as well as overall shortgrass prairie breeding birds, to represent the Shortgrass Prairie Region assessment. The Swift Fox (*Vulpes velox*), Black-tailed Prairie Dog (*Cynomys ludovicianus*), Burrowing Owl (*Athene cunicularia*) and breeding shortgrass prairie birds represent species of which there is baseline data that has been verified. During the grant period ODWC biologists and game wardens monitored populations of the Swift Fox and Black-tailed Prairie Dog based on protocols established by regional working groups for these species. Burrowing Owl and Shortgrass prairie breeding bird surveys were conducted by ODWC biologists and Oklahoma City Zoo staff in accordance with Breeding Bird Survey protocol. Following are the results from the monitoring efforts for Swift Fox and Black-tailed Prairie Dog and surveys for Burrowing Owl and shortgrass prairie breeding birds.

Table 1. Species of Greatest Conservation Need for Shortgrass Prairie Region Compilation of Information * 1=high knowledge; 2= some knowledge; 3= no knowledge

<u>Species</u>	<u>Distribution Knowledge</u>	<u>Habitat Knowledge</u>	<u>Sources of Information/data</u>	<u>WCRP/ SWG Projects</u>	<u>Comments</u>
Loggerhead Shrike	1	1	BBA, T26, T25, RMBO	T25, T26	
Swainson's Hawk	1	1	BBA, T26, RMBO, McConnel Dissertation under T4	T-26, T4	
Texas Horned Lizard	2	2	T4, T24	T4, T24	
Burrowing Owl	1	1	BBA, T4, T33, T26, RMBO	T4, T33	
Long-billed Curlew	1	1	T4, T33, RMBO, USGS	T4, T33	
Mountain Plover	1	1	T-4, E-? (Shackford), RMBO	T4	
Black-tailed Prairie Dog	1	1	E53, T4, T33	T4, T33	
Cassin's Sparrow	1	1	BBA, RMBO		
Baird's Sparrow	2	1	USFWS 12-month finding and status review		no SGP OK records
Chestnut-collared Longspur	2	2	none		missed by atlas projects
Ferruginous Hawk	1	1	T25, T26, RMBO, McConnel Dissertation and T4, Sutton Center Report 1980s	T25, T26	
McCown's Longspur	2	2	none		missed by atlas projects
Short-eared Owl	1	1	RMBO, McConnel Dissertation and T4	T4	
Brazilian Free-tailed Bat	1	2	T4 (mixed grass prairie region)	T-4	doesn't belong in this region
Desert Shrew	3	3	none		not being picked up under T23
Swift Fox	1	1	E49, T4, T33	T4, T33	
Texas Gartersnake	3	2	Snakes of Texas		taxonomic questions - subspecies of common garter snake in OK Herp Book
Texas Long-nosed Snake	3	2	Snakes of Texas		
Western Massasauga	3	3	none		
Round-tailed Horned Lizard			T24	T24	
Western Big-eared Bat	2	1	OSU DOD funded study?, WAFWA project		
Bell's Vireo	2	1	T4, McConnel Dissertation and T4, BBA	T4	
Buff-breasted Sandpiper			Birds of Oklahoma		one record Cimarron County 1962
Interior Least Tern	1	1	COE study, Robgr Boyd 1990s		
Lesser Prairie Chicken	2	2	RMBO, ODWC sightings, Sutton Center Study, PR?		
Snowy Plover	1	2	BBA, Roger Boyd 1990s incidental		
Whooping Crane	2	2	RSR		

Table 1. Species of Greatest Conservation Need for Shortgrass Prairie Region Compilation of Information (Con.'t)

<u>Species</u>	<u>Distribution Knowledge</u>	<u>Habitat Knowledge</u>	<u>Sources of Information/data</u>	<u>WCRP/ SWG Projects</u>	<u>Comments</u>
Arkansas Darter	1	1	New SWG project to start fall 2006	Tx	
Arkansas River Shiner	1	1	USFWS 12-month finding and status review, critical habitat designation		
Arkansas River Speckled Chub	2	2	E8		extirpated
Lewis's Woodpecker	1	1	BBA, Birds of Oklahoma, Shackford?		
Pinyon Jay	1	1	Birds of Oklahoma		
Common Lesser Earless Lizard	3	2	Reptiles of Kansas		
American Golden Plover	1	1	Birds of Oklahoma		
Bullock's Oriole	1	1	RMBO, BBA		
Black Rail	3	1	none		
Harris's Sparrow	1	1	T25 T4	T25, T4	
LeConte's Sparrow			Birds of Oklahoma		1 record Beaver County Date?
Little Blue Heron	2	1	BBA		
Painted Bunting	1	1	BBA, T4	T4	
Piping Plover	2	1	USFWS Recovery Plan; Roger Boyd 1990s		transient; records 1987 & 88
Red-headed Woodpecker	1	1	RMBO, BBA, T4	T4	
Upland Sandpiper	2	2	few historic records, BBA		
Western Sandpiper	2	1	US Shorebird plan		
Wilson's Phalarope	2	1	none		
Yellow Rail					no records for SGP in OK
Flathead Chub	1	1	Jimmie Pigg Survey		

• Key to Source Information on next page

Key to Source of Information for Table 1.	
BBA	<i>Oklahoma Breeding Bird Atlas</i> , Sutton Avian Research Center
Birds of Oklahoma	<i>Oklahoma Bird Life</i> , Baumgartner, F.M., A. Marguerite, 1992. University of Oklahoma Press
E-26	Shackford, J. S., and D. M. Leslie, Jr. 1994. Mountain Plover breeding activity on cultivated fields. Federal aid project E-26-1. Oklahoma Department of Wildlife Conservation, Oklahoma City, Oklahoma. 11 pages.
E-49	Hoagland, J. W. 2002. Population distribution of Swift Fox in northwestern Oklahoma using a track search survey. Federal Aid Project E-49-1. Oklahoma Department of Wildlife Conservation, Oklahoma City.
E-53	Hoagland, J. W. 2003. Determining black-tailed prairie dog acreage in Oklahoma. Federal Aid Project E-53. Oklahoma Department of Wildlife Conservation, Oklahoma City.
McConnell dissertation	McConnell, S., T. J. O'Connell , and D. M. Leslie, Jr. 2008. Land cover associations of breeding habitat for three sympatric <i>Buteos</i> in shortgrass prairie. <i>The Wilson Journal of Ornithology</i> 120: 708–716.
RMBO	Section-based Monitoring of Breeding Birds within the Shortgrass Prairie Bird Conservation Region (BCR 18), Rocky Mountain Bird Observatory
Roger Boyd, USACOE	U.S. Army Corps of Engineers, USFWS, OK Div of Wildlife Conservation, Summer, 2005. Fixed-wing Aerial Survey of Interior Least Terns on Cimarron, Canadian, and Red River Systems in KS, OK, TX, NM.
RSR	ODWC Rare Species Report
T-24	A Herpetological Survey of the Black Mesa Ecoregion and Surrounding Area, State Wildlife Grant
T-25	Winter Bird Atlas, Sutton Avian Research Center, State Wildlife Grant
T-26	Status and Demography of Grassland Raptors of Conservation Concern in the Oklahoma Panhandle, Schnell, Gary D. State Wildlife Grant
T-33	Development of the Shortgrass Prairie Region Species of Greatest Conservation Need Conservation Assessment and Conservation Strategy, State Wildlife Grant
T-4	Wildlife Diversity Inventory and Development of Species of Greatest Conservation Need Management Plans, State Wildlife Grant
U.S. Shorebird Plan	Brown, S., C. Hickey, B. Harrington, and R. Gill, eds. 2001. The U.S. Shorebird Conservation Plan, 2nd ed.
USGS	Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, P. A. Rabie, and B. R. Euliss. 2003. Effects of management practices on grassland birds: Long-billed Curlew. Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife Research Center Online. http://www.npwr.usgs.gov/resource/literatr/grasbird/lbcu/lbcu.htm (Version 12DEC2003).
	Manomet Center for Conservation Sciences, Manomet, MA.

Swift Fox

In Oklahoma, the Swift Fox (*Vulpes velox*) is classified as furbearer with a year-round closed season and also as a state species of special concern. Within the Oklahoma Comprehensive Wildlife Conservation Strategy, the Swift Fox is included as a Tier II (middle priority in a three-tier system) Species of Greatest Conservation Need (ODWC 2005). The current and historic ranges of the Swift Fox within Oklahoma have been described in previous reports to the Swift Fox Conservation Team, and recent surveys (since 1998) have demonstrated that the fox's historic and current geographic ranges are largely similar. The Swift Fox is typically associated with relatively level, shortgrass prairie rangeland and landscape-level mosaics of rangeland and dryland (non-irrigated) winter wheat fields in the panhandle of Oklahoma (Cimarron, Texas and Beaver counties) and portions of two adjacent counties – Ellis and Harper counties (Hoagland 2002, Kilgore 1969). To a limited extent, the Swift Fox also occurs in mixed-grass prairie and sand sagebrush shrubland habitats where these are grazed and embedded within or adjacent to shortgrass prairie and winter wheat fields. Since the 1950s, the Swift Fox's geographic range appears to have contracted slightly westward, but by less than 30 miles, and is unlikely to persist in Woodward County where it had been documented historically (Glass 1959). However, it remains widespread, though apparently at low densities, in the three panhandle counties, northern Ellis County and western Harper County.

The Oklahoma Department of Wildlife Conservation has conducted track surveys to monitor the Swift Fox population regularly since 1998, with the most recent occurring, prior to this grant period, in 2004. Approximately 204 townships in five counties are considered to contain potentially suitable habitat for Swift Fox in Oklahoma. We surveyed a representative sub-sample (102) of these townships across three counties in the Oklahoma panhandle. Although our survey did not cover the entire range of the Swift Fox in Oklahoma, the three counties surveyed encompass 204 townships and nearly 83% of the Swift Fox's range in Oklahoma. Of these townships, half (102) have been selected for monitoring surveys on a three-year rotation.

Methods:

We conducted timed-searches for Swift Fox tracks in a small subset of townships in Cimarron, Texas, and Beaver counties to monitor trends in the relative abundance and geographic range of the Swift Fox. Our survey method was identical to the protocol that we have used since 1998 and involves a timed search for Swift Fox tracks, within suitable Swift Fox habitat, within predetermined townships, using available tracking substrates (Hoagland 1999 and 2002). The surveys were road-based and the most commonly used tracking substrates were the margins of dirt and gravel county roads and access roads leading to natural gas well sites or irrigation wells. Other more opportunistic tracking substrates included the edges of plowed fields and patches mud found in roadside ditches. Each township was surveyed for a minimum of 30 minutes

Landscape Classification	% of Swift Fox Detections				
	2007	2008	2009	2011	2012
100% Rangeland	57%	42%	44%	25%	24%
≥ 50% Rangeland	19%	33%	32%	42%	22%
100% Agricultural Areas*	24%	25%	24%	33%	54%

* Agricultural Areas are described as non-irrigated winter wheat, fallow fields and/or CRP fields.

and a maximum of 120 minutes. Observers recorded the time that elapsed between the beginning of each survey and the time at which the first Swift Fox track was detected. If a Swift Fox track line was detected during the first 30 minutes of the survey, the observer continued to search for track lines in the township until the minimum 30-minute survey period had been reached. As a result, it was possible to record multiple Swift Fox locations within a township. If no Swift Fox tracks were observed during the first 30 minutes of the survey, the surveyor continued to search for track lines within the township until a set of Swift Fox tracks were located or until the maximum survey time of 120 minutes was reached. If no fox tracks were located after 120 minutes of searching, the survey in the township ceased, the observer recorded that no tracks were found and then moved on to the next township to initiate a new survey. Each observer carried a stopwatch and recorded the time that was spent actually searching substrates for fox tracks. Typically, an observer would search a section of road for 5 to 10 minutes, return to his or her vehicle, stop the stopwatch and drive to a new location. At the new location, the observer would resume keeping time and searching for tracks. Track searches were commonly conducted at five to twelve locations within a township. The results, by year are shown in Table 2.

During the search for Swift Fox tracks, we recorded our observations of the tracks of all other carnivores (e.g. Coyote, Striped Skunk, American Badger). Additionally, we recorded the tracks of Black-tailed Jackrabbits because of the potential confusion between the size and shape of Swift Fox tracks and those left by the front paws of jackrabbits. To minimize misidentification with jackrabbit tracks, we only considered a track line to be that of a Swift Fox if we could locate a continuous track line of 15 or more footprints. The track surveys were conducted during the months of October and/or November.

Most Swift Fox track detections occurred in landscapes that were dominated by rangeland. In the Oklahoma panhandle, most rangeland consists of native prairie communities dominated by a combination of Hairy Grama (*Bouteloua hirsuta*), Blue Grama (*Bouteloua gracilis*), Buffalograss (*Buchloe dactyloides*), Sideoats Grama (*Bouteloua curtipendula*) and Little Bluestem (*Schizachyrium scoparium*). A few of the areas that we classified as rangeland had historically been crop fields, but they had been planted to either native grasses or Yellow (Old World) Bluestem (*Bothriochloa ischaemum*) as part of either the Soil Bank

program in the 1950s or the Conservation Reserve Program in the 1980s and 1990s. In all cases, these former Soil Bank or CRP sites were grazed and structurally functioned as rangeland. The on-going drought in the Oklahoma panhandle has altered the physical attributes of the landscape in several ways. Many of the Conservation Reserve Program (CRP) fields contained vegetation that was shorter and sparser than observed in previous years. A few of the CRP fields have been hayed or grazed, but most of them have experienced slower vegetation growth as a result of the drought. As a result of these drought-related changes, most CRP fields are structurally similar to native shortgrass prairie rangeland and may be more suitable for Swift Foxes than is normally the case. Another change observed was an increase in the number and frequency of fallow fields. We assume that this is drought-related as well and that some landowners opted not to plant wheat this fall due to dry soil conditions.

As participants in the Swift Fox Conservation Team, Oklahoma will continue to monitor Swift Fox populations to avoid listing under the Endangered Species Act.

Black-Tailed Prairie Dog

The Oklahoma Department of Wildlife Conservation has been involved with the Interstate Black-tailed Prairie Dog Conservation Team, later changed to Prairie Dog Conservation Team (PDCT), since 1998 when the Black-tailed Prairie Dog (BTPD) was petitioned to be listed as threatened under the Endangered Species Act. In 1999 the BTPDCT finalized a conservation plan that established conservation objectives for the species, which included establishing a conservation team, drafting State specific management plans, the identification of focus areas for conservation, and a commitment to monitor the Black-tailed Prairie Dog (BTPD) population. In 2003 an addendum to the conservation plan was added entitled, "A Multi-State Conservation Plan for the Black-tailed Prairie Dog, *Cynomys ludovicianus*, in the United States." The goal of the national, and associated State management plans, was to remove enough threats to the BTPD that long-term conservation of the species will be assured through State management. In 2009, the Oklahoma conservation plan for BTPD was approved. The acreage objective for BTPD occupancy for Oklahoma is 68,000 acres. Occupancy has declined significantly across the Oklahoma Shortgrass Prairie Region from 60,000 acres in 2008 to 28,000 acres in 2013 due to plague and continuing exceptional drought conditions.

A significant portion of the occupied prairie dog acreage in the U.S. is on private land where the Endangered Species Act (ESA) has less ability to influence land and species management, and where voluntary private landowner agreement is necessary for successful conservation on a landscape scale. Many private landowners are reluctant to partner to conserve a species if they believe they are risking ESA restrictions in the future. However, increasing occupied acreage and the level of active conservation on private land are necessary to meet acreage goals identified by the states in their management plans. Oklahoma initiated a

Landowner Incentive Program (LIP) as part of their state management plan and currently has 16,811 acres enrolled in the program. Participating landowners receive \$10/acre/year for a ten-year conservation agreement.

Conservation goals for state-specific management plans include population monitoring; however survey methods were not consistent across the range. In 2011, the PDCT made a range-wide recommendation for BTPD survey method to incorporate analysis of NAIP imagery and/or aerial transects as a method to make data comparable between states. Although the states have not yet completed standardizing BTPD survey methods, states have recognized the benefits of using imagery and are conducting additional survey efforts to evaluate the use of NAIP Imagery. Oklahoma has conducted the most significant evaluation to date. The evaluation used 2010 NAIP Imagery scanned at a scale of 1:4000 to locate signs of prairie dog colonies across 40 prairie dog counties in Oklahoma. The estimation in 2010 was approximately 200,000 acres of area occupied by prairie dog colonies, with nearly 75% of the population located in the 3 panhandle counties. However caution is strongly suggested for when ODWC biologists, game wardens and OKC Zoo staff (under this grant), conducted ground-truthing surveys in 2011, 2012, and 2013 at identified possible colonies to verify the mapping, it was found that the GIS mapping over estimated occupied acres in excess of seven times.

Table 4 shows the results of BTPD surveys within this grant period.

Table 4. Black-Tailed Prairie Dog Colony Information by Year					
Oklahoma Conservation Plan Occupancy Objective: 68,000 acres					
	2008	2010	2011	2012	2013
Estimate of occupied Acreage	55,000 - 60,000	42,000	42,000	42,000	28,000
Acreage Under Management	14,031.50	16,811	16,811	16,811	16,811
Estimate of Objective	88%	62%	62%	62%	41%

As participants in the Prairie Dog Conservation Team, Oklahoma will continue to monitor BTPD populations to avoid listing under the Endangered Species Act.

Burrowing Owl

Currently in Oklahoma, the Burrowing Owl is known for its association with prairie dog colonies in the 3 panhandle counties during the breeding season. Though once more widespread, conversion of native rangeland to cropland, and particularly prairie dog eradication have resulted in a decline across its historical range. Two types of surveys were conducted tied to Burrowing Owls. In 2006, prairie dog colonies were surveyed for Burrowing Owls. In Texas County, 26 of the 39 colonies surveyed were being used by burrowing owls (n= 85). In Beaver County, 21 of 48 colonies surveyed were being used by burrowing owls (n= 43).

In 2007, breeding bird surveys were conducted consisting of road-based routes selected where a greater percentage of native range appeared to occur within Texas and Beaver counties. Habitat variables were recorded at each stop count location. In Texas County, 114 of 132 stop count locations included some native rangeland within the stop count location. Three owls were observed within stops that had native rangeland, 2 were not within native rangeland. In Beaver County, 108 of 142 stop count locations include some native rangeland within the stop count location. No owls were observed within these locations but 2 were observed in CRP lands.

Table 5. Burrowing Owl Survey Results			
Year	County	Texas County	Beaver County
Burrowing Owl Survey Results within BTPD Colonies			
2006	PD colonies surveyed	39	48
	PD colonies with owls	26	21
	Total owls seen	85	43
	range	1 to 15 owls per colony	1 to 6 owls per colony
Burrowing Owl Survey Results during Breeding Bird Survey			
2007	Total Stop Count Locations	132	142
	Total Stop Count Locations in Native Range	114	108
	Stop Counts in Native Range with owls	3	0
	Total owls seen	5	2

The comparison between the 2 surveys (targeted Prairie Dog colonies to a road-based route) could verify the importance of Black-tailed Prairie Dog colonies to breeding Burrowing Owls in the Shortgrass Prairie Region of Oklahoma. Conservation actions that benefit BTPD will most likely benefit Burrowing Owls.

Shortgrass Prairie Breeding Bird Surveys - 2006 & 2007 Breeding Season

After reviewing the methods and results from the previous two years of the shortgrass prairie breeding bird survey with the Rocky Mountain Bird Observatory (2004 – 2005), it was decided that the method needed to be modified to better meet the requirements of the Comprehensive Wildlife Conservation Strategy (CWCS) for the “Species of Greatest Conservation Need” (SGCN) in the shortgrass prairie region. The Oklahoma City Zoological Park agreed to continue providing staff for the survey project.

Method

In order to address the conservation issue for the shortgrass prairie region of inadequate data concerning SGCN, the survey included both Texas and Beaver counties. Preliminary planning included locating six possible survey routes for each county on topographic maps, with an emphasis on locating survey routes specifically within native range. With staffing from the Oklahoma City Zoo, 2

survey teams per county were created. The surveys were conducted in accordance with standard breeding bird survey protocol. The team began their survey route ½ hour prior to official sunrise and stopped by 11:00 am. Point count locations were spaced ½ mile apart and all birds observed and heard within 5 minutes were recorded. Each team noted on their survey form the habitat types 360° out from the point count location.

Results

The shortgrass prairie breeding bird surveys for Texas and Beaver counties were conducted May 22nd through May 25, 2006 and May 21st through May 25th, 2007, respectively, with a total of 9 routes surveyed in 2006 and 12 routes in 2007. Habitat types along the 6 routes in Beaver County included native range, CRP, cultivation and plowed areas. Habitat types along the 3 routes in Texas County included native range, cultivation, and CRP. Tables 7 – 13 show the percentage of habitat types per route.

A total of 91 species were recorded for the 2-year survey, 14 of which are dependent and semi-dependent on the shortgrass prairie habitat types (List 1). The 10 most abundant species for each year is provided in List 2. The 5 most abundant species for both years included mourning dove, western meadowlark, cliff swallow, lark sparrow and western kingbird (List 2). SGCN and shortgrass prairie dependent and semi-dependent species recorded during the surveys are shown in Table 6. The results from each survey route are provided (Tables 7 -14) and each include the general location of the route and a description of the area. Please note that while 12 routes were surveyed in 2007, only 9 routes can show a comparison between the 2 years.

List 2. Ten most abundant species. Highlighted species are SGCN or are shortgrass dependent or semi-dependent.

May, 2006	
Species	Total #
Mourning Dove	658
Western Meadowlark	643
Cliff Swallow	329
Lark Sparrow	289
Western Kingbird	289
Cassin's Sparrow	286
Red-winged Blackbird	137
Northern Bobwhite	129
Horned Lark	112
Eastern Meadowlark	110

May, 2007	
Species	Total #
Western Meadowlark	849
Mourning Dove	616
Cliff Swallow	284
Western Kingbird	245
Lark Sparrow	193
Grasshopper Sparrow	138
Red-winged Blackbird	136
Horned Lark	130
Cassin's Sparrow	107
Brown-headed Cowbird	92

Table 6. Shortgrass Prairie Breeding Bird Survey Results from 2006 & 2007.

Shows results only for Shortgrass Prairie Region SGCN (highlighted in yellow) and species that are shortgrass prairie-dependent or semi-dependent. * Relative Abundance not noteworthy

Species	Total #		Relative Abundance		Frequency of Occurrence	
	2006	2007	2006	2007	2006	2007
Burrowing Owl	14	7	0.003	0.0017	0.33	0.25
Cassin's Sparrow	286	107	0.068	0.026	1.00	1.00
Ferruginous Hawk	2	2	*	*	0.22	0.16
Horned Lark	112	130	0.026	0.032	1.00	1.00
Lesser Prairie-Chicken	5	0	0.001	0	0.22	0
Loggerhead Shrike	30	21	0.007	0.005	0.88	0.66
Long-billed Curlew	0	2	0	*	0.00	0.08
Say's Phoebe	3	4	0.0007	0.0009	0.33	0.16
Scaled Quail	21	12	0.005	0.003	0.66	0.33
Swainson's Hawk	16	9	0.004	0.002	0.66	0.58
Western Meadowlark	643	849	0.15	0.21	1.00	0.92

Discussion

The routes surveyed did include an adequate representation of native range which is somewhat challenging to locate with the prevalence of CRP enrolled acreage in this area. It should be noted that though both counties surveyed occur in the shortgrass prairie region, the two counties have different plant communities within native range. In addition to the typical shortgrass prairie habitat type which is dominated by grama grasses and buffalograss, there are narrow belts of sand dune topography along the Cimarron and Beaver (North Canadian) Rivers. Sandsage makes up a large part of the ground cover with scattered bunches of bluestems between the sandsage. Dense thickets of sand plum and fragrant sumac also occur along the tops of stable dunes and in scattered pockets. Along the rivers and creeks stands of cottonwoods, hackberries, and elms occur. The occurrence of trees and shrubs within this shortgrass prairie region increase the diversity of bird species though not necessarily those associated with prairie communities. Areas recorded as CRP also exhibited a variety of plant structure. CRP included those land areas planted to Yellow (Old World) bluestem (dense plant structure), those that were once CRP but are now grazed (could still see terracing but otherwise exhibited "shortgrass" structure), and those that had been enrolled under the Soil Bank Program of the mid-1950's that had patches of little bluestem throughout the area. This variety of plant structure probably also contributed to a diversity of birds not typical of the shortgrass prairie.

Table 7. Route #1 occurs in the central part of the county and is the westernmost route of the survey. Spring Area Creek and Teepee Creek were intersected on the route. Both creeks drain into the Beaver River. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 7. Texas County - Route #1		
NR= 75% CRP= 6% C= 19%		
Species	Total #	
	2006	2007
American Kestrel	3	0
American Robin	1	0
Baltimore Oriole	0	4
Barn Swallow	2	8
Brown-headed Cowbird	1	0
Bullock's Oriole	0	4
Burrowing Owl	5	0
Cassin's Sparrow	35	18
Cliff Swallow	8	11
Eastern Kingbird	18	9
Eastern Meadowlark	0	66
Eurasian Collared-Dove	0	3
European Starling	5	25
Great Blue Heron	1	0
Grasshopper Sparrow	3	12
Horned Lark	7	2
Killdeer	5	2
Lark Sparrow	11	9
Loggerhead Shrike	2	1
Mallard	1	0
Mourning Dove	28	24
Northern Bobwhite	5	2
Northern Harrier	1	0
Red-headed Woodpecker	4	1
Ring-necked Pheasant	6	1
Rock Dove	0	2
Red-tailed Hawk	4	3
Red-winged Blackbird	28	8
Scaled Quail	5	0
Swainson's Hawk	1	1
Turkey Vulture	6	0
Western Kingbird	44	35
Western Meadowlark	80	0
Wild Turkey	15	0
Total # Birds	335	251
Total # Species	29	23

Table 8. Route #3 is located in the central part of the County. Stretches of Goff Creek are intersected on this route. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 8. Texas County - Route #3		
NR= 62% C= 38%		
Species	Total #	
	2006	2007
American Kestrel	1	0
American Robin	1	0
Baltimore Oriole	1	2
Barn Swallow	11	10
Brown-headed Cowbird	2	1
Brewer's Blackbird	0	5
Bullock's Oriole	7	1
Cassin's Sparrow	39	14
Curve-billed Thrasher	0	1
Chimney Swift	1	0
Cliff Swallow	6	0
Common Grackle	1	5
Common Nighthawk	3	1
Eastern Kingbird	0	1
European Starling	2	3
Great Blue Heron	0	1
Great Horned Owl	0	4
Grasshopper Sparrow	9	6
House Finch	2	0
Horned Lark	5	11
House Sparrow	3	0
Killdeer	11	2
Lark Bunting	0	1
Lark Sparrow	12	7
Loggerhead Shrike	7	0
Mourning Dove	59	21
Northern Bobwhite	6	0
Northern Mockingbird	3	4
Ring-necked Pheasant	9	3
Rock Dove	9	0
Red-tailed Hawk	0	1
Red-winged Blackbird	29	3
Say's Phoebe	0	2
Scaled Quail	6	1
Scissor-tailed Flycatcher	1	1
Swainson's Hawk	2	1
Turkey Vulture	2	0
Western Kingbird	60	33
Western Meadowlark	63	48
Total # Birds	373	194
Total # Species	31	29

Table 9. Texas County - Route #7		
NR= 57% CRP= 18% C= 25%		
Species	Total #	
	2006	2007
American Crow	1	0
American Kestrel	2	0
American Robin	2	0
Barn Swallow	12	6
Brown-headed Cowbird	4	2
Blue Jay	1	1
Bullock's Oriole	8	6
Burrowing Owl	8	2
Cassin's Sparrow	38	17
Cliff Swallow	7	27
Common Grackle	3	1
Common Nighthawk	10	2
Dickcissel	0	1
Eastern Bluebird	0	1
Eastern Kingbird	6	4
European Starling	8	0
Greater Roadrunner	0	1
Grasshopper Sparrow	25	23
Horned Lark	1	1
Killdeer	3	6
Lark Sparrow	28	16
Loggerhead Shrike	1	0
Mallard	0	1
Mourning Dove	58	61
Northern Bobwhite	3	6
Northern Mockingbird	10	6
Orchard Oriole	1	0
Red-bellied Woodpecker	1	0
Red-headed Woodpecker	5	2
Ring-necked Pheasant	7	13
Red-tailed Hawk	3	1
Red-winged Blackbird	19	6
Say's Phoebe	1	0
Scaled Quail	5	0
Scissor-tailed Flycatcher	0	2
Turkey Vulture	0	1
Western Kingbird	67	22
Western Meadowlark	92	73
Wild Turkey	12	6
Total # Birds	452	317
Total # Species	33	30

Table 9. This route is located in the southeast portion of the County. A couple of unnamed intermittent creeks were intersected and one prairie dog town was accessed by the route. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 10. This route is located in the northeast portion of the county and in many areas along the route it parallels the Cimarron River. As a result, several riparian corridors occur along this route. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 10. Beaver County - Route #1		
NR= 54% CRP= 36% C= 9% P= < 1%		
Species	Total #	
	2006	2007
American Crow	2	0
American Kestrel	1	5
Ash-throated Flycatcher	0	2
Baltimore Oriole	1	1
Barn Swallow	3	0
Bell's Vireo	2	0
Bewick's Wren	2	0
Brown-headed Cowbird	7	11
Blue Grosbeak	3	3
Blue Jay	4	2
Brown Thrasher	3	4
Bullock's Oriole	4	10
Cassin's Sparrow	20	6
Cliff Swallow	33	100
Common Grackle	0	8
Common Nighthawk	2	0
Common Yellowthroat	2	0
Dickcissel	4	2
Downy Woodpecker	1	0
Eastern Kingbird	10	13
Eastern Meadowlark	15	0
European Starling	10	0
Great Crested Flycatcher	6	5
Grasshopper Sparrow	14	3
Horned Lark	12	1
House Wren	4	2
Killdeer	5	1

Lark Sparrow	29	16
Loggerhead Shrike	5	4
Mississippi Kite	2	1
Mourning Dove	52	55
Northern Bobwhite	23	10
Northern Flicker	1	1
Northern Mockingbird	12	5
Orchard Oriole	1	2
Red-bellied Woodpecker	5	1
Red-headed Woodpecker	6	3
Ring-necked Pheasant	3	4
Red-tailed Hawk	0	3
Red-winged Blackbird	4	6
Say's Phoebe	0	2
Scaled Quail	2	0
Scissor-tailed Flycatcher	12	11
Vesper Sparrow	2	0
Warbling Vireo	4	0
Turkey Vulture	0	13
Western Kingbird	10	9
Western Meadowlark	38	57
White-eyed Vireo	0	1
Wild Turkey	1	4
Yellow-billed Cuckoo	1	5
Yellow Warbler	0	1
Total # Birds	383	393
Total # Species	45	40

Table 11. This route is located in the eastern half of the County and is an almost straight north-south route. Native range was essentially the only habitat type represented on this route. The route intersects the Beaver River and includes active dunes and prairie dog towns. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 11. Beaver County - Route #2		
NR= 95% P= 5%		
Species	Total #	
	2006	2007
American Crow	1	0
American Kestrel	1	0
American Robin	1	0
Baltimore Oriole	2	6
Barn Swallow	10	2
Brown-headed Cowbird	12	10
Blue Grosbeak	1	1
Brown Thrasher	2	0
Bullock's Oriole	2	2
Burrowing Owl	1	0
Cassin's Sparrow	67	22
Chipping Sparrow	1	0
Cliff Swallow	123	54
Common Nighthawk	8	2
Eastern Kingbird	7	1
Eastern Meadowlark	33	3
Eastern Phoebe	0	1
European Starling	1	2
Ferruginous Hawk	0	1
Field Sparrow	3	7
Great Blue Heron	2	0
Great Crested Flycatcher	3	0
Grasshopper Sparrow	3	12
Horned Lark	6	11

House Sparrow	1	0
Killdeer	6	4
Lark Sparrow	56	12
Loggerhead Shrike	4	2
Mallard	0	4
Mourning Dove	80	30
Northern Bobwhite	38	14
Northern Cardinal	1	0
Northern Flicker	2	0
Northern Harrier	0	1
Northern Mockingbird	26	3
Northern Rough-winged Swallow	0	1
Red-headed Woodpecker	0	1
Ring-necked Pheasant	8	3
Red-tailed Hawk	3	2
Red-winged Blackbird	5	6
Say's Phoebe	1	0
Scaled Quail	1	0
Scissor-tailed Flycatcher	5	2
Swainson's Hawk	1	0
Turkey Vulture	2	1
Warbling Vireo	1	0
Western Kingbird	19	2
Western Meadowlark	111	61
Yellow-billed Cuckoo	1	0
Total # Birds	662	286
Total # Species	43	33

Table 12. This route is located in the eastern quarter of the county. The route is a straight north-south route and includes intersecting the Beaver River. At one of the point count locations a recent burn had occurred. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 12.Beaver County - Route #3		
NR= 56% CRP = 29% C= 15%		
Species	Total #	
	2006	2007
Baltimore Oriole	6	0
Barn Swallow	4	1
Bewick's Wren	1	0
Brown-headed Cowbird	28	17
Blue Grosbeak	1	2
Brown Thrasher	5	2
Bullock's Oriole	16	8
Cassin's Sparrow	18	9
Chimney Swift	1	0
Cliff Swallow	103	0
Common Grackle	7	4
Common Nighthawk	14	1
Dickcissel	9	2
Eastern Kingbird	10	4
Eastern Meadowlark	27	0
European Starling	1	4
Ferruginous Hawk	1	0
Great Blue Heron	1	0
Gray Catbird	0	1
Grasshopper Sparrow	14	2
Hairy Woodpecker	0	1
House Finch	1	0
Horned Lark	16	4
Killdeer	4	18
Lark Sparrow	26	16
Lesser Prairie-Chicken	3	0

Loggerhead Shrike	5	2
Mallard	1	4
Mourning Dove	125	50
Northern Bobwhite	13	6
Northern Mockingbird	19	5
Orchard Oriole	0	1
Red-headed Woodpecker	4	0
Ring-necked Pheasant	9	0
Rock Dove	2	0
Red-winged Blackbird	29	28
Scissor-tailed Flycatcher	12	5
Swainson's Hawk	0	1
Warbling Vireo	1	0
Western Kingbird	2	11
Western Meadowlark	58	92
Yellow Warbler	0	1
Total # Birds	597	302
Total # Species	37	29

Table 13. This route is located in the southeast portion of the County, just east and south of Lake Evans Chambers. Part of this route parallels Kiowa Creek and there are several riparian corridors as well as shelterbelts. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 13. Beaver County - Route #4		
NR= 83% CRP = 3% C=14%		
Species	Total #	
	2006	2007
American Kestrel	1	0
American Robin	3	0
Baltimore Oriole	3	1
Barn Swallow	8	1
Belted Kingfisher	1	0
Bewick's Wren	4	1
Brown-headed Cowbird	11	4
Blue Grosbeak	1	0
Blue Jay	6	1
Brown Thrasher	5	0
Bullock's Oriole	13	0
Canada Goose	0	1
Cassin's Sparrow	54	9
Common Grackle	7	0
Common Nighthawk	3	1
Eastern Bluebird	2	1
Eastern Kingbird	20	1
Eastern Meadowlark	33	0
European Starling	2	7
Field Sparrow	2	0
Great Crested Flycatcher	10	1
Greater Roadrunner	2	0
Grasshopper Sparrow	3	3
Horned Lark	1	2
House Sparrow	3	0
House Wren	1	0
Killdeer	5	3

Lark Sparrow	61	8
Lesser Prairie-Chicken	2	0
Loggerhead Shrike	2	2
Mallard	0	2
Mississippi Kite	2	3
Mourning Dove	102	27
Northern Bobwhite	28	4
Northern Cardinal	4	0
Northern Flicker	4	1
Northern Mockingbird	40	3
Northern Rough-winged Swallow	0	2
Orchard Oriole	7	1
Olive-sided Flycatcher	0	1
Red-headed Woodpecker	2	3
Red-tailed Hawk	6	2
Red-winged Blackbird	6	7
Scissor-tailed Flycatcher	12	7
Swainson's Hawk	2	0
Vesper Sparrow	0	1
Western Kingbird	27	6
Western Meadowlark	56	43
Yellow-billed Cuckoo	1	0
Total # Birds	568	160
Total # Species	44	33

Table 14. This route is located just south and east of the town of Beaver. Clear Creek as well as its tributaries are intersected multiple times on this route. Two prairie dog towns are accessed on this route as well. Habitat Type Codes: NR = native range; CRP= conservation reserve program; C= cultivation; P= plowed.

Table 14. Beaver County - Route #5		
NR= 57% CRP = 37% C=5% P= 1%		
Species	Total #	
	2006	2007
American Kestrel	1	0
American Robin	1	1
Baltimore Oriole	0	1
Barn Swallow	11	17
Bell's Vireo	1	0
Bewick's Wren	0	1
Brown-headed Cowbird	15	6
Blue Grosbeak	1	1
Blue Jay	4	1
Brown Thrasher	1	4
Bullock's Oriole	9	5
Cassin's Sparrow	9	2
Chimney Swift	2	0
Cliff Swallow	46	60
Common Grackle	0	5
Common Yellowthroat	1	0
Eastern Bluebird	2	0
Eastern Kingbird	14	13
Eastern Meadowlark	2	3
Eastern Phoebe	0	1
European Starling	16	11
Ferruginous Hawk	1	0
Great Blue Heron	1	0
Great Crested Flycatcher	3	0
Great Horned Owl	1	0
Grasshopper Sparrow	8	1
Hairy Woodpecker	1	0

Horned Lark	24	12
House Wren	1	0
Killdeer	10	8
Lark Sparrow	34	11
Loggerhead Shrike	3	3
Mallard	3	5
Mourning Dove	86	68
Northern Bobwhite	6	5
Northern Mockingbird	5	4
Northern Rough-winged Swallow	9	2
Orchard Oriole	2	5
Painted Bunting	1	0
Red-bellied Woodpecker	1	0
Red-headed Woodpecker	8	1
Red-tailed Hawk	1	2
Red-winged Blackbird	13	11
Ring-necked Pheasant	1	2
Rock Dove	3	0
Say's Phoebe	1	0
Scissor-tailed Flycatcher	4	0
Swainson's Hawk	6	1
Turkey Vulture	2	6
Vesper Sparrow	4	0
Warbling Vireo	5	1
Western Kingbird	44	18
Western Meadowlark	43	139
Wood Duck	6	0
Yellow-headed Blackbird	13	0
Total # Birds	490	437
Total # Species	51	36

Conservation Assessment of the Shortgrass Prairie Region SGCN

Our monitoring efforts are in collaboration with interstate conservation teams that have standardized methods for monitoring these specific species and we continue to coordinate with these teams by providing survey updates and participating in meetings where possible. This regional approach helps our understanding on the species status on a regional level. During this grant period, ODWC established a Research Section that is dedicated to developing and maintaining a geodatabase for all conservation regions in Oklahoma. Due to the imminent listing of the Lesser Prairie-chicken (LEPC) as a federally-threatened species, the staff focused on the Shortgrass Prairie Region. Data layers were created within a GIS framework of vegetation communities, identifying and prioritizing cores areas of habitat and corridors that need to be connected in order to provide complete conservation areas for the LEPC. Survey data for the LEPC has been incorporated into the GIS to help track conservation efforts. Fortunately all of these data layers created within the Shortgrass Prairie Region will help with conservation strategies for SGCN within this Region as data generated can be stored and tracked.

With over 90% of land in the Shortgrass Prairie Region in Oklahoma in private ownership, assistance from landowners is critical to SGCN conservation. Some landowners within this Region have demonstrated their willingness to cooperate with ODWC on management efforts. For example, under the Landowner Incentive Program, created to provide technical and financial assistance for restoration, enhancement and protection of Black-tailed Prairie Dogs within the Shortgrass Prairie Region, 16,811 acres were enrolled. Under the Lesser Prairie-Chicken Candidate Conservation Agreement with Assurances (CCAA), almost 400,000 acres of private land were enrolled. Each landowner received a management plan with timeline for habitat work on the property.

The Shortgrass Prairie Region falls within the Playa Lakes Joint Venture (PLJV). We have been collaborating with the PLJV for several years on projects including restoration of playas, public education about playas and helping to create a Decision Support System (DSS) that provides tools to natural resource professionals, land managers and developers. These tools include spatially explicit data, maps, and written guidance that can inform decisions that may impact playas and their associate wildlife.

Considering the ongoing monitoring efforts on key SGCN, the creation of a geodatabase to track, analyze and maintain data layers in the Shortgrass Prairie Region, the Playa Lake DSS for developers, and landowner assistance programs, we feel that a combined conservation strategy for SGCN for the Shortgrass Prairie Region as a whole can be developed.

Recommended Conservation Strategy for the Shortgrass Prairie Region

A conservation strategy for SGCN of the Shortgrass Prairie Region can be addressed as a whole, in accordance with Oklahoma's CWCS, because the primary threat to all species dependent on shortgrass prairie landscapes is the availability of suitable habitat

conditions. The historical forces that shaped the shortgrass prairie (primarily grazing and climate) created a patchwork of vegetation in a variety of growth stages and conditions. Ideally modern prairie management needs to continue to create this patchwork of vegetation by duplicating the timing, intensity and landscape distribution of those natural historic forces. The ultimate goal is to maintain or restore populations of SGCN, to provide species management flexibility, and to encourage SGCN population connectivity.

1. Maintain collaborative efforts with interstate and regional conservation teams including the Swift Fox Conservation Team, the Prairie Dog Conservation Team, Interstate Lesser Prairie-Chicken Working Group, Playa Lakes Joint Venture, and the Grassland Coordinator of the Western Association of Fish and Wildlife Agencies. This includes, but not limited to, providing data from monitoring and survey efforts.
2. Continue monitoring SGCN within the Shortgrass Prairie Region, particularly the Swift Fox, Black-tailed Prairie Dog, and Lesser Prairie-Chicken . Provide data to interstate conservation teams and the GIS staff for continued updating of data layers.
3. Maintain SGCN distributions as outlined within the respective strategies of interstate/regional conservation teams.
4. Maintain geodatabase for Shortgrass Prairie Region and its SGCN as well as other species dependent on Shortgrass Prairie. Biologists will need to provide data to the GIS staff from ongoing monitoring efforts, survey efforts, and landowner contacts and update as needed.
5. Continue programs that help restore and conserve existing native shortgrass through landowner incentive, state and federal cost-share, and/or voluntary management programs. Though programs may target specific species, many shortgrass prairie species will benefit.
6. Foster private landowner relationships within the Shortgrass Prairie Region. Attend local ranch meetings, provide programs and/or meet one-on-one with landowners.
7. Identify and encourage research studies that contribute to Shortgrass Prairie conservation and management.
8. Promote public support for conservation activities within the Shortgrass Prairie Region through education and information exchange e.g. social media, articles for private landowners in Your Side of the Fence, news releases for newspapers that cover the 3 counties in Oklahoma, support and/or offer watchable wildlife opportunities for shortgrass prairie species.
9. Use Decision Support Tools (CHAT, PLJV DST) to foster open relationships with industry by providing information that will help avoid, minimize or mitigate impacts to SGCN within the Shortgrass Prairie Region.

These recommendations will be incorporated into OCACS after approval by an ODWC review committee. It is recommended that the CACS for the Shortgrass Prairie Region be reviewed in 10 years.

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