United States Department of Agriculture
Natural Resources Conservation Service

CEAP Conservation Insight
Conservation Effects Assessment Project
December 2009

Estimated CRP Benefits to Priority Shortgrass Prairie Birds

Summary Findings

- The 6.1 million acres enrolled in the Conservation Reserve Program (CRP) in the shortgrass prairie regions of Nebraska, Colorado, Kansas, Oklahoma, New Mexico, and Texas provide important grassland habitat for priority bird species associated with this landscape.
- Geospatial land cover analysis tools and species-specific habitat models developed by the Playa Lakes Joint Venture (PLJV) provide a means to quantify the contribution of CRP habitats to meeting population goals for important grassland birds.
- The species showing the greatest benefit from CRP is the grasshopper sparrow; CRP contributes more than 27.5 percent of the grasshopper sparrow's population goal for the shortgrass prairie Bird Conservation Region (BCR18). Also noteworthy, CRP contributes over 10 percent of the lesser prairie-chicken population goal for the BCR.
- Some species benefit little, if at all, from CRP (e.g., mountain plover) because the typical CRP vegetation structure in BCR18 (which tends to be taller and denser than native shortgrass prairie) is not preferred by this species.
- The occurrence of CRP enrollments near existing grassland improved the quality of these existing grasslands by increasing the size of large blocks of grass. This improvement contributes nearly 4 percent of the population goal for lesser prairie-chickens in the shortgrass prairie portion of Texas.

Recommendation

- Strategically planning CRP enrollments spatially and managing cover on enrolled lands have the potential to improve the ability of conservationists to support priority grassland bird populations in the Great Plains.

Background

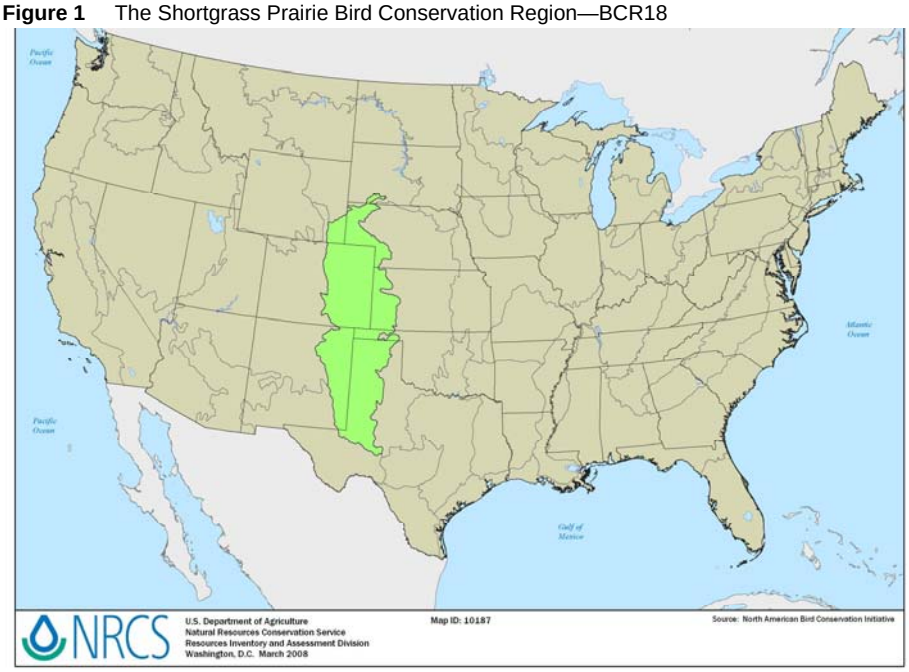
The Conservation Reserve Program (CRP) is a USDA program under which private landowners voluntarily establish grass and other conservation vegetation on highly erodible and other environmentally sensitive cropland. Landowners receive annual rental payments on enrolled acreage under 10- to 15-year contracts.

By 2006, nearly 6.1 million acres in the Shortgrass Prairie Bird Conservation Region (BCR18—see fig. 1) had been enrolled in CRP and established in grass cover. Due to loss of native grass and documented declines in grassland bird populations in North America (Samson and Knopf 1994), the CRP has great potential to affect shortgrass prairie birds. Whereas many studies have documented localized benefits of CRP enrollments to grassland birds (King and Savidge 1995, Best et al. 1997, Rodgers 1999, Reynolds et al. 2001), few have quantified the effects of CRP on regional bird populations.

When CRP was established in 1985, its primary purpose was to reduce soil erosion and surplus commodities. Many CRP fields in the Great Plains were planted to monocultures or mixtures of introduced grass species that have remained undisturbed. As a result, CRP fields may have vegetation composition and structure that differ from remaining native prairie. Wildlife habitat potential varies with CRP stand characteristics.

Since 1985, Congress has broadened the focus of CRP to include soil, water, and wildlife resource conservation objectives. In 1991, USDA began using an Environmental Benefits Index (EBI) to select offers for enrollment into CRP to maximize soil conservation benefits. In 1997, the EBI was revised to include factors to maximize wildlife, water quality, soil conservation, and air quality benefits. Additionally, in recognition of the need for periodic disturbance and management of CRP land, managed haying and grazing have been authorized as tools to improve the quality of CRP lands for wildlife.

Figure 1 The Shortgrass Prairie Bird Conservation Region—BCR18



The 2008 Farm Bill added provisions for routine grazing on CRP lands. Managed haying and grazing are particularly important additions to the program as they allow the opportunity to alter the vegetation structure of existing CRP habitat to suit the requirements of target wildlife species. These changes to CRP are promising for wildlife conservation, especially for grassland birds, considering the large CRP enrollments in the Great Plains.

Partnership for Evaluation

In 2007, a partnership was formed among the Playa Lakes Joint Venture (PLJV), Natural Resources Conservation Service (NRCS), and Farm Service Agency (FSA) to conduct an evaluation of the effects of lands enrolled in the CRP on priority grassland birds. In 2008, PLJV completed the first of two assessments, an evaluation of the effects of the CRP on priority birds in the *Mixed-grass* Prairie BCR. (A separate Conservation Insight for that assessment is available at ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/ceap/pljv_crp.pdf .)

This Conservation Insight provides a brief synopsis of the second assessment, which evaluates the effects of CRP on *shortgrass* prairie birds; full details are available from the PLJV final project report posted in the library section of the CEAP Web site (http://www.nrcs.usda.gov/technical/nri/ceap/).

The PLJV led the effort, using tools and resources uniquely applicable to this assessment:

- **Species for Management Action (SMA) database**. A tool that compiles and stores conservation status information from multiple sources for all bird species in the region.

- **Hierarchical All Bird System (HABS) database.** A tool developed to calculate a landscape's capacity to achieve species-specific population objectives for priority species, under current land use and alternative future scenarios.

- **A review of distribution, habitat use, and population density data for the HABS database.** An exhaustive literature review (updated frequently) that serves as a one-stop resource guide for demographic and ecological information on bird species occurring in the central Great Plains (Dobbs 2007).

- **Great Plains GIS Partnership (G^2P^2)**. A collaborative group of geographic information system (GIS) professionals from the U.S. Fish and Wildlife Service, PLJV, Rainwater Basin Joint Venture, Nebraska Game and Parks Commission, and Central Platte Natural Resources District dedicated to the development, evaluation, and integration of GIS data into biological and landscape level planning models for the central Great Plains.

This project was initiated to answer the question, "How many birds does the CRP support in BCR18?" Seven priority species that are known to use CRP or cropland habitat in BCR18 and for which adequate density data are available were selected for analysis (table 1).

The assessment was designed to produce BCR18 estimates of—

- the number of birds CRP currently supports during the breeding season;
- the number of birds that would be supported if all CRP acres were converted back to cropland; and
- how those estimates compare to established regional population goals for assessed species.

Assessment Approach

Effects of CRP on individual priority bird species were assessed by comparing the habitat carrying capacities of the following two land cover scenarios for the Shortgrass Prairie BCR:

1. Land cover with current (2006) CRP fields included in the landscape.
2. Land cover with all current CRP fields converted to cropland. The amount of each crop type apportioned to these cropland acres was based on 2004 National Agricultural Statistics Service county-level data.

The difference in habitat carrying capacity between the two scenarios is therefore a useful measure of the effect of current CRP enrollments on breeding habitat potential in BCR18 for each of the seven bird species examined.

Four integrated components were used to create and compare the two assessment scenarios:

1. A seamless spatial land cover layer for BCR18 that depicts specific habitat Associations and Conditions
2. Bird densities
3. Bird population goals
4. The HABS database

These components provided the founda-

Table 1 Priority bird species analyzed

Species analyzed were those that use CRP and/or cropland habitat within BCR18 during the breeding season, are among the species identified by the PLJV Landbird and Shorebird Teams by consolidating regional and continental lists of species of concern, and for which adequate density data are available.

Common Name	Description	Conservation Notes
Cassin's sparrow	migratory landbird	PIF[1] Stewardship Species
Grasshopper sparrow	migratory landbird	PIF Stewardship Species
Lark bunting	migratory landbird	PIF Stewardship Species
Lesser prairie-chicken	resident upland game bird	PIF Watch List
Mountain plover	migratory shorebird	Imperiled (continental)[2]
Ring-necked pheasant	resident upland game bird	
Swainson's hawk	migratory raptor	PIF Watch List, Tier II At-risk Species[3], Category II Species of Special Concern in Oklahoma

[1]Partners in Flight
[2]U.S. Shorebird Conservation Plan
[3]Nebraska Natural Legacy Plan

tion for the four principal steps in the analysis:

1. Calculate the number of acres of each habitat, including CRP from FSA Common Land Unit data, within each state-level sector of BCR18 and determine the availability and suitability of each habitat to each bird species. CRP habitat condition was derived from the conservation practice used during enrollment of each CRP contract (PLJV 2007).

2. Calculate bird species-specific carrying capacities for the two landscape scenarios by linking bird species densities to habitat area and condition in each state-level sector of BCR18. To do this, the PLJV Landbird Team and Shorebird Team assigned priority species to habitat Associations (broad landcover classes) and Conditions (landcover characteristics important to birds). Species densities were determined for each habitat Association and Condition based on an exhaustive literature review (Dobbs 2007) and integration of U.S. Geological Survey Breeding Bird Survey (BBS) relative abundance maps. Densities were stored in HABS and related to the acreage of each habitat Association and Condition to calculate carrying capacities.

3. Step down the national population goals of each species to each state-level sector of BCR18. The PLJV Landbird Team developed population goals for all priority species in BCR18 following the Partners in Flight objectives of returning bird populations to 1970s levels (Rich et al. 2004). Current carrying capacity of each species was determined by multiplying their habitat-specific densities (Step 2) by the number of acres of habitat in the land cover (Step 1). Population goals were calculated as follows. If the species' BBS population trend (Sauer et al. 2006) is >0 (a growing population), the population goal equaled the estimated current carrying capacity (a goal of maintaining the population). If the species' population trend is <0 (a declining population), the following formula was applied to determine a population goal:

$$\frac{\text{Current Estimated Carrying Capacity}}{(1\text{-Absolute Value [Trend]})}$$ [29]

4. Determine how much of the population goal is being addressed by CRP enrollments by comparing the carrying capacities of the two landscape scenarios using HABS. Each state within the BCR was analyzed separately because bird population goals and bird-to-habitat links (i.e., densities) are most appropriately related at this spatial scale.

As many habitat parameters as possible were included in evaluating the effect of CRP on priority shortgrass prairie birds, including spatial and landscape characteristics. Since detailed data on vegetation composition and management of individual CRP contracts were not available, assumptions based on expert opinions on the proportion of CRP fields that were planted to native or non-native species were used. For many grassland bird species, the relative importance of specific field characteristics in meeting individual species' habitat requirements is neither well understood nor well documented. Wherever species-specific data were available they were incorporated into calculations of carrying capacity.

Use of the Hierarchical All Bird System (HABS)

The HABS database is a tool developed by PLJV to store parameters and calculate a landscape's capacity to achieve population objectives for priority species. The carrying capacity can be based on current conditions (i.e., current habitat availability) and/or potential future conditions (i.e., alternative scenarios of future habitat availability resulting from conservation and management work). In HABS, data are stored in a hierarchical manner such that each bird density is specific to not only a species but also to a geographic area, a habitat within that area, a condition of that habitat, and a season of the year. For example, lesser prairie-chickens occur at a density of 0.0125 bird/ac during the breeding season on CRP lands planted to native grass in the Kansas portion of BCR18.

To better reflect a species' full range of spatial and temporal distribution and habitat use within the PLJV region, HABS stores data on the availability and suitability of habitat acres. HABS incorporates three factors (Range Factor, Suitability Factor, and Large Block Factor) regarding spatial-temporal variation among species.

Population goals and carrying capacities presented in this report are estimates and do not reflect a true census of any bird species and thus should be viewed with caution. These estimates reflect the potential capacity of the landscape to support bird populations based on the best available spatial landcover and species-to-habitat densities. Furthermore, the species-to-habitat densities used in this analysis are based on bird count data rather than nesting success/density; therefore, carrying capacity represents species occurrence not recruitment.

Results

Landscape Features

BCR18 spans over 95 million acres of gently sloping terrain comprised of prairie, wetlands, croplands, woodlands, urban areas, reservoirs and streams in portions of eight Great Plains states. The portions of BCR18 in South Dakota and Wyoming were not included in this analysis. Historically dominated by shortgrass prairie, BCR18 is now dominated by cropland (making up about 43% of its total land cover). Shortgrass prairie is dominated by blue grama and buffalo grass interspersed with small amounts of tallgrass species in the east (e.g., little bluestem, Indiangrass). Common shrub species occurring in BCR18 are sand sagebrush and sand shinnery oak.

Colorado and Texas represent the largest portions of BCR18, with 28.1 and 25.9 million acres, respectively. New Mexico contains 16.9 million acres in BCR18,

The lesser prairie-chicken

while both Nebraska and Kansas each represent about 9 million acres. Oklahoma contains the smallest portion, about 4.3 million acres.

Land cover in BCR18 varies most noticeably along a longitudinal gradient, where grassland is most abundant in the west and cropland is most abundant in the east. Over 70 percent of all grassland acres in BCR18 (31.5 million acres) occur in Nebraska, Colorado, and New Mexico. Kansas, Oklahoma, and Texas contain much smaller portions of BCR18 grassland, <25 percent combined. Kansas and Oklahoma contain the fewest grassland acres, <3 percent of BCR18 grasslands each.

Cropland, including land in the CRP, makes up about half of the total area of BCR18 (39.6 million acres; fig. 2). All BCR18 portions of states are made up of at least 45 percent cropland, except New Mexico which is only 10 percent cropland. Cropland makes up over 80 percent of BCR18 in Kansas. The dominant crop types in BCR18 are dryland wheat, sorghum, corn (grown mostly in the north), and cotton (grown mostly in the south). Other crops include alfalfa, soybeans, sunflowers, peanuts, millet, and hay.

In 2006, about 16 percent of all cropland (about 6.1 million acres) in BCR18 was enrolled in the CRP. Of the 6.1 million acres of CRP in BCR18, nearly all (99 percent) are planted to grass (table 2).

Effects of CRP on Priority Shortgrass Prairie Birds

At the state/BCR18 level, the contribution of CRP habitats to meeting the population goals for the various priority species ranged from 0 to 28 percent (table 3). The species showing the greatest benefit from CRP was grasshopper sparrow, with CRP contributing 27.5 percent of its population goal in BCR18. Lesser prairie-chicken also benefited considerably from CRP, which contributed over 10 percent of its BCR18 population goal (table 4). CRP also contributed 8 to 9 percent of the population goals for Cassin's sparrow, lark bunting, and ring-necked pheasant (table 3). Swainson's hawks showed a smaller benefit (5 percent) from CRP. This species uses grassland and cropland habitat types at similar rates. One species, mountain plover, showed no benefit from CRP (the species does not use CRP habitat) but instead showed an increase in population goal (3 percent) when CRP was converted to cropland (the species uses fallow cropland).

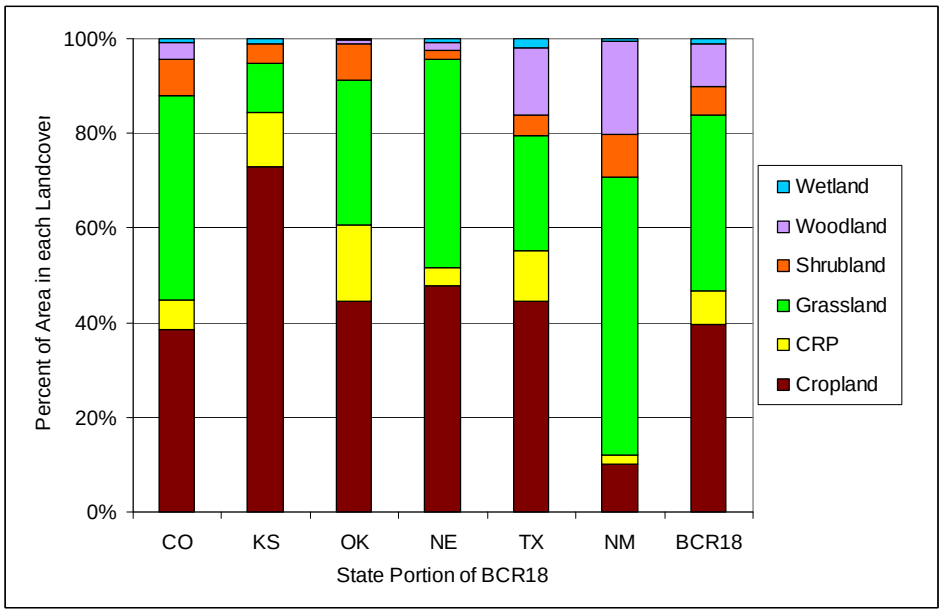
For lesser prairie-chicken, the occurrence of CRP grasslands in the vicinity of non-CRP grasslands has the potential to effectively increase the size of grassland habitat blocks, making areas suitable for this species that would otherwise remain unsuitable isolated habitat patches. The effect of CRP enrollments that contribute to the creation or expansion of large habitat blocks is presented in table 4 and illustrated in figure 3.

The seven priority bird species included in this analysis are species which are documented as using CRP and/or cropland in BCR18 (and had sufficient density data). Many shortgrass prairie bird species, especially those endemic to the area, require vegetation structure and composition that CRP does not currently provide in most areas because of nonnative plant materials used and/or lack of disturbance (i.e., grazing, haying) (McLachlan 2001). Thus, the findings in this report do not apply to the broad suite of shortgrass prairie-associated birds, but rather to a subset that generally represents species that use a variety of grassland habitats, in particular, those that use habitat with moderate grass height, relatively dense vegetation, and little to no shrub cover.

This analysis indicates that the CRP is contributing significantly to the population goals of several priority shortgrass prairie birds. The degree of benefit varies by species and geographic area. Two species stand out as benefiting considerably from CRP in at least one area of their range (grasshopper sparrow and lesser prairie-chicken). For these species, it appears CRP is making substantial impacts on their populations. For other species, the benefit of CRP is moderate by comparison but still significant in terms of conservation of these species (Cassin's sparrow, lark bunting, and ring-necked pheasant).

For mountain plover and Swainson's hawk, both of which occur and nest in cropland-dominated areas, there is no apparent benefit from CRP. For mountain plover, CRP fields, even those that are native, cannot provide the required habitat structure unless they experience heavy disturbance which results in very short vegetation with plenty of bare ground. Although it is possible to achieve these characteristics, doing so would conflict with the other goals of the CRP, in particular, reducing soil erosion. The tall, dense vegetation structure of CRP, relative to shortgrass prai-

Figure 2 Land cover composition as a percentage of area for each state within the shortgrass prairie BCR and the entire BCR (excluding South Dakota and Wyoming)



Source: PLJV BCR18 seamless spatial landcover data layer

Table 2 Estimated acres of CRP by general vegetation establishment practice in each state within the shortgrass prairie Bird Conservation Region (BCR18). CRP acreage estimates are from FSA's Common Land Unit (CLU) spatial data layer

State	Native grass[1]	Non-native grass[1]	Trees (upland)	Trees (riparian)	Wetland	Wetland (non-floodplain)	Other practices	All CRP
Nebraska	29,099	261,888	17,729	99	1,529	0	560	**310,904**
Colorado	160,692	1,446,231	4,953	366	652	0	1,709	**1,614,603**
Kansas	1,001,576	0	1,098	37	224	337	1,021	**1,004,293**
Oklahoma	42,453	382,073	3	7	0	0	0	**424,536**
New Mexico	28,766	258,890	311	1,819	383	0	88	**290,526**
Texas	250,366	2,253,296	1,943	928	4,870	45	431	**2,511,879**
BCR18	**1,512,952**	**4,602,378**	**26,037**	**3,256**	**7,658**	**382**	**3,809**	**6,156,472**

[1] Due to ambiguities in the CRP conservation practice "Existing Grass" (CP10), the percentage of acres of native and non-native CRP grass (a condition in HABS) is based on the opinion of CRP experts familiar with enrollment and planting practices within each state.

Table 3 State-level BCR18 sector population goals and existing carrying capacity, modeled contribution of CRP enrollments, and expected loss of carrying capacity if CRP were converted to cropland and its effect on meeting population goals for six priority grassland bird species

	State area of BCR18			CRP Contribution		CRP to cropland	
State	Population goal	Carrying capacity	Percent of population goal met	Carrying capacity	Percent of population goal	Carrying capacity change	Percent of population goal change
Cassin's sparrow							
Colorado	1,060,175	815,668	77	76,490	7.2	-74,978	**-7.1**
Kansas	558,622	429,788	77	143,025	25.6	-136,827	**-24.5**
Oklahoma	337,800	259,894	77	50,773	15.0	-40,557	**-12.0**
New Mexico	2,483,760	1,910,934	77	34,404	1.4	-33,945	**-1.37**
Texas	2,200,597	1,693,076	77	299,438	13.6	-265,557	**-12.0**
BCR18	**6,640,954**	**5,109,360**	**77**	**604,130**	**9.1**	**-551,864**	**-8.3**
Grasshopper sparrow							
Nebraska	2,722,529	1,386,484	50	192,925	7.1	-187,819	**-6.9**
Colorado	1,493,825	760,750	50	314,636	21.0	-302,949	**-20.3**
Kansas	2,358,110	1,200,899	50	670,154	28.4	-618,789	**-26.2**
Oklahoma	1,188,207	605,110	50	146,886	12.3	-118,068	**-9.9**
New Mexico	1,109,674	565,116	50	9,953	0.9	-8,609	**-0.8**
Texas	2,711,342	1,380,787	50	289,672	10.6	-258,790	**-9.5**
BCR18	**11,583,687**	**5,899,146**	**50**	**1,624,226**	**27.5**	**-1,495,024**	**-25.3**
Lark bunting							
Nebraska	1,443,717	735,232	50	100,187	6.9	-85,449	**-5.9**
Colorado	6,643,713	3,383,399	50	553,264	8.3	-506,286	**-7.6**
Kansas	1,316,512	670,451	50	107,870	8.2	-37,539	**-2.9**
Oklahoma	644,855	328,401	50	86,773	13.5	-67,256	**-10.4**
New Mexico	479,483	244,183	50	5,868	1.22	-4,412	**-0.9**
Texas	469,303	238,999	50	51,074	10.9	-40,343	**-8.6**
BCR18	**10,997,583**	**5,600,665**	**50**	**905,036**	**8.2**	**-741,285**	**-6.7**
Mountain plover							
Nebraska	617	314	50	0	0	25	**4.0**
Colorado	7,303	3,719	50	0	0	209	**2.9**
Kansas	1,697	864	50	0	0	79	**4.7**
Oklahoma	461	235	50	0	0	29	**6.1**
New Mexico	1,294	659	50	0	0	1	**0.0**
Texas	452	230	50	0	0	7	**1.5**
BCR18	**11,824**	**6,021**	**50**	**0**	**0**	**350**	**2.9**
Ring-necked pheasant							
Nebraska	103,186	60,933	60	2,235	2.2	1,402	**1.4**
Colorado	208,566	123,162	60	16,737	8.0	-1,382	**-0.7**
Kansas	188,135	111,097	60	11,945	6.4	2,681	**1.5**
Oklahoma	13,703	8,108	60	1,666	12.1	203	**1.5**
New Mexico	15,554	9,185	60	1,013	6.6	-233	**-1.5**
Texas	202,278	119,449	60	26,220	13.0	-5,961	**-2.9**
BCR18	**731,422**	**431,934**	**60**	**59,816**	**8.2**	**-3,290**	**-0.4**
Swainson's hawk							
Nebraska	1,904	1,904	100	38	2.0	37	**2.0**
Colorado	34,716	34,716	100	1,334	3.8	375	**1.1**
Kansas	13,701	13,701	100	2,003	14.6	-463	**-3.3**
Oklahoma	1,525	1,525	100	149	9.6	81	**5.3**
New Mexico	28,611	28,611	100	273	1.0	-25	**-0.1**
Texas	9,674	9,674	100	876	9.1	-315	**-3.3**
BCR18	**90,131**	**90,131**	**100**	**4,673**	**5.2**	**-310**	**-0.3**

Table 4 State-level BCR18 sector population goals and existing carrying capacity, modeled contribution of CRP enrollments, and expected loss of carrying capacity if CRP were converted to cropland and its effect on meeting population goals for lesser prairie-chicken, a species reliant on large blocks of grassland habitat

	State area of BCR18			CRP in large blocks		CRP to cropland	
State area	Population goal	Carrying capacity	Percent of population goal	Carrying capacity	Percent of population goal	Carrying capacity lost/gained	Percent of population goal lost/gained
Colorado	12,579	4,090	33%	27	0.2%	-27	-0.2%
Kansas	30,045	9,769	33%	4,934	16.4%	-4,934	-16.4%
Oklahoma	1,922	625	33%	14	0.7%	-14	-0.7%
New Mexico	3,300	1,073	33%	3	0.1%	-3	-0.1%
Texas	818	266	33%	16	2.0%	-16	-2.0%
BCR18	**48,664**	**15,823**	**33%**	**4,994**	**10.3%**	**-4,994**	**-10.3%**

	State area of BCR18			Non-CRP habitat in large blocks		CRP to cropland	
State area	Population goal	Carrying capacity	Percent of population goal	Carrying capacity	Percent of population goal	Carrying capacity lost/gained	Percent of population goal lost/gained
Colorado	12,579	4,090	33%	4,063	32.3%	-122	-1.0%
Kansas	30,045	9,769	33%	4,835	16.1%	-270	-0.9%
Oklahoma	1,922	625	33%	611	31.8%	-40	-2.1%
New Mexico	3,300	1,073	33%	1,070	32.4%	-6	-0.9%
Texas	818	266	33%	250	30.6%	-32	-3.9%
BCR18	**48,664**	**15,823**	**33%**	**10,829**	**22.3%**	**-470**	**-1.0%**

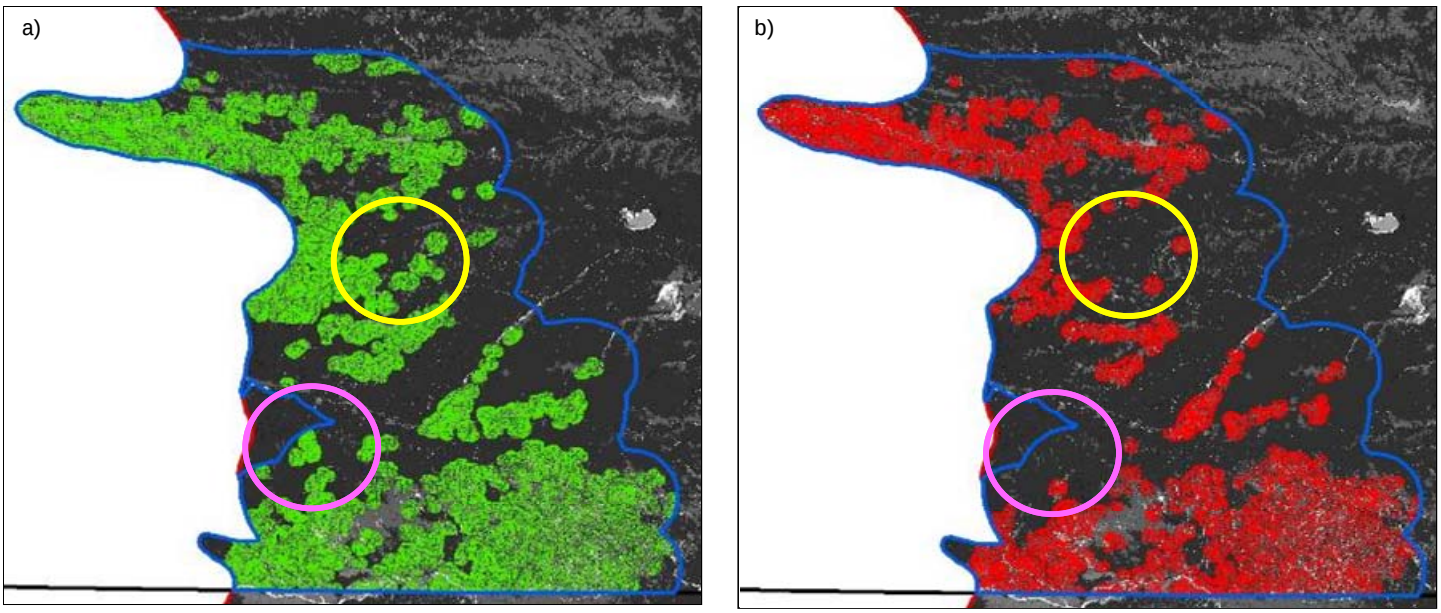


Figure 3 An example of the amount of large blocks of suitable lesser prairie-chicken habitat (within its range in BCR19-KS) when: a) CRP is included in the land cover (large block acres are green), and (b) CRP is reclassified to cropland (large block acres are red). Notice the change in large block acres inside the yellow and pink circles.

rie, may limit the benefit of CRP for Swainson's hawk, which requires relatively short stature grasses that make prey more visible.

Comparing the overall effect of CRP among the states, CRP in Kansas often produced the most benefit for priority birds. This benefit is largely attributable to the fact that nearly all CRP grass in Kansas is planted with native species, as opposed to the mostly non-native CRP grasses in the other states. Native grasses generally provide more suitable habitat for grassland birds, and thus, birds occur at greater densities on this habitat. This is particularly true in the shortgrass prairie where native grasslands are short in stature, unlike many of the non-native CRP grasses that were established in the region (such as smooth brome, weeping lovegrass, and old world bluestem). In our analysis, CRP in Kansas showed greater benefit to three species (Cassin's sparrow, lark bunting, and lesser prairie-chicken) that are either documented as or thought by experts as using native CRP plantings at higher densities than non-native plantings.

CRP proved beneficial to lesser prairie-chicken, an area-sensitive species, in two ways. First, it provides suitable

habitat through native CRP plantings, and second, it creates large blocks of suitable habitat by connecting otherwise fragmented small blocks of native habitat. Spatial models showed that CRP contributed to and connected large blocks of suitable habitat for lesser prairie-chicken; consequently, when CRP was reclassified to cropland, it resulted in fragmentation of that previously suitable habitat. In addition to the prairie-chicken, other priority birds in this analysis are area- and/or disturbance-sensitive, including grasshopper sparrow. However, the area requirements (i.e., size of habitat block) are much smaller for grasshopper sparrow (20 to 30 acres in Nebraska; Helzer 1996, Helzer and Jelinski 1999) relative to the average size of a CRP field in BCR18 (about 125 acres for grass and wildlife habitat plantings). PLJV researchers did not develop spatial models or apply Large Block Factors for grasshopper sparrow to evaluate CRP.

Overall, CRP is positively affecting a variety of priority bird species in the shortgrass prairie. Although some species benefit more than others, in general CRP provides an alternative suitable habitat typically preferred over otherwise present cropland. CRP is particularly important in connecting and enlarging existing blocks of fragmented prairie habitat. This is a critical landscape component (i.e., habitat corridors and buffers) for area-sensitive and ground-nesting birds such as the lesser prairie-chicken.

Putting Findings into Practice

Insights from this assessment can be used to increase the benefits of CRP to grassland birds. Managing vegetation on existing enrollments and affecting the configuration of new enrollments are essential elements of this process.

Focus on species of concern

CRP delivery can be aimed at benefiting species that are of highest conservation concern as well as species for which action will benefit the most species (i.e., umbrella species or groups instead of single species). Priority species can be identified, as they were in this CEAP project, by consolidating Federal, regional, and state species conservation lists and determining which species occur in the planning area. It is also important to determine if CRP is an appropriate tool. Wildlife habitat is only one of several goals of the CRP, and the management required to benefit a particular species should be conducted while considering soil conservation and other natural resource objectives. For example, the mountain plover is a high priority species of the shortgrass prairie that requires bare ground and short stature grassland vegetation. Managing CRP for such conditions on highly erodible soil may increase erosion. Therefore, it is necessary to consider the habitat requirements of identified priority species and onsite conditions in determining appropriate management actions.

Spatial targeting

Enrollment or re-enrollment of CRP contracts can be spatially targeted according to surrounding land use and landscape context and according to the spatial habitat requirements of priority species. Spatial targeting can locate and rank existing CRP fields and qualified crop fields based on their potential benefit to priority species. This process answers the question, "Where is CRP needed to benefit a high-priority species?"

Decision support tools (DST) that evaluate CRP fields, crop fields, and the habitat requirements of bird species (including spatial parameters) against the landscape through a Geographic Information System (GIS) are particularly useful. PLJV developed and used a DST for this assessment to identify suitable habitat for lesser prairie-chickens. The DST evaluated CRP location, acres, and conservation practice within the context of surrounding habitat. Other species requirements and priorities can be layered to maximize benefits for a suite of target species.

Figure 4 shows how this DST can help prioritize future CRP enrollments by ranking crop fields into tiers of potential benefit to lesser prairie-chickens based on adjacency to large blocks of native habitat, existing CRP fields, and major roads. Ranking CRP and crop fields according to potential benefit to birds allows strategic enrollment and re-enrollment of fields, creating more and higher quality habitat. Various incentives and outreach measures can be employed to encourage enrollment or re-enrollment of high-priority habitats.

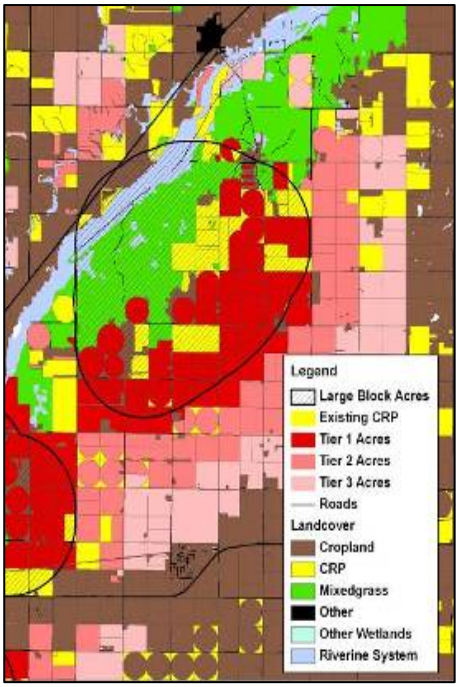


Figure 4 Map produced by a Decision Support Tool showing the rank [Tier 1 = highest priority for CRP enrollment (red), Tier 2 = medium priority (dark pink), Tier 3 = low priority (light pink)] of crop fields near existing large blocks of suitable lesser prairie-chicken habitat.

Vegetation management

Habitat condition of CRP fields is just as important as field location. CRP plantings that resemble the native plant communities in which they are imbedded and managed to meet the habitat needs of the priority species are most beneficial. This can be achieved by planting diverse mixtures of native plants, including grasses, forbs, and shrubs that are adapted to particular soil types within the region. Proper stand development may require application of specific maintenance activities such as weed control or re-seeding to encourage full emergence of plantings. Management activities to achieve more specific desired vegetation structure and composition such as prescribed grazing, burning, or haying may also be needed.

Strategic CRP delivery will increase conservation benefits to the species that need them the most and will save substantial conservation dollars by using them more effectively. The current op-

portunistic approach of CRP delivery has certainly provided considerable benefit to many wildlife species, including grassland birds; however, the potential impact of a more targeted approach to CRP and wildlife conservation is tremendous. This assessment quantifies substantial habitat benefits that the CRP is providing to several priority shortgrass prairie bird species. Benefits would likely be greater with more strategic approaches to enrollment and habitat management in the future.

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The Conservation Effects Assessment Project: Translating Science into Practice

The Conservation Effects Assessment Project (CEAP) is a multi-agency effort to build the science base for conservation. Project findings will help to guide USDA conservation policy and program development and help farmers and ranchers make informed conservation choices.

One of CEAP's objectives is to quantify the environmental benefits of conservation practices for reporting at the national and regional levels. Because fish and wildlife are affected by conservation actions taken on a variety of landscapes, the wildlife national assessment draws on and complements the national assessments for cropland, wetlands, and grazing lands. The wildlife national assessment works through numerous partnerships to support relevant studies and focuses on regional scientific priorities.

Primary investigators on this project were Megan McLachlan, Mike Carter, and Christopher Rustay of the Playa Lakes Joint Venture. The PLJV is a nonprofit partnership of federal and state wildlife agencies, conservation groups, private industry, and landowners dedicated to conserving bird habitat in the southern Great Plains. It provides science-based guidance and decision-support tools for all-bird conservation throughout the region, as well as outreach, coordination and financial support to its partners and local groups to conduct on-the-ground habitat conservation and restoration.

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