A STATUS REPORT ON CONSERVATION ACTIONS AND THREAT REDUCTION BY USDA’S NATURAL RESOURCES CONSERVATION SERVICE AND FARM SERVICE AGENCY PROGRAMS FOR LESSER PRAIRIE-CHICKEN FROM 2008-2011.

Prepared by Christian A. Hagen, Oregon State University, Bend, Oregon

Data compiled and reviewed by Jon Ungerer, NRCS, Manhattan, Kansas, and Rod Winkler, FSA, Manhattan, Kansas

Introduction

In 1998, the US Fish and Wildlife Service (the Service) identified the lesser prairie-chicken (LEPC) as a candidate for protections under the Endangered Species Act, but was precluded because of higher listing priorities, and it was assigned a listing priority ranking of 8. Since 1998, there have been annual status reviews to determine whether or not LEPCs warranted full protection under ESA. In 2008 LEPC listing ranking was upgraded from an 8 to a 2. The recent law suit by WildEarth Guardians (Mult-District Litigation 2011) has forced the Service to make decisions on all candidate species under a set schedule for decision-making. Under that guidance a proposed rule for listing or not listing LEPC is due in the Federal Register by September 2012. Data gathering is now “complete” and analyses and assessment are being conducted.

There are three scenarios that could result from the proposed rule: a finding of not warranted, which would be considered a final action, not open to public comment; threatened; or endangered, the latter two would open a year of data gathering and public comment before a final rule is filed in approximately September 2013.

The goal of this white paper is to provide a detailed account of conservation actions implemented by USDA agencies both NRCS and FSA from circa 2008 to present, to provide the Service and partners with a record of threat reduction activities during that time frame. This white paper is organized by each of the 5 threat factors, and each will be prefaced with excerpts from the 2008 status review to provide context and baseline as to how effective USDA programs have been in addressing threats to this species.

This white paper represents a synopsis of information shared with the 5 State Fish and Wildlife Agency Directors and Regions 2 and 6 of the Service on 23-24 April 2012. The data herein should be viewed as interim and minimums insofar as many of these issues will be more fully detailed in the months to come, and if any refinements occur would be an accounting of more acreage applied not less.

FACTOR A. THE PRESENT OR THREATENED DESTRUCTION MODIFICATION OR CURTAILMENT OF ITS HABITAT OR RANGE.

Energy development transmission corridors and similar human impacts are NOT THE PURVIEW OF USDA programs and are not covered here.
“CRP encompasses a very significant portion of currently occupied range in most LEPC states, but particularly Kansas where expansion of the LEPC population is directly related to the amount of land enrolled in CRP (p 17).”

“The importance of CRP habitat to status and survival of LEPC was recently emphasized by Rodgers and Hoffman (2005 pp122-123). They determined the presence of CRP lands which had been planted to native species of grasses facilitated the expansion of LEPC range in Colorado, Kansas, and New Mexico....Where introduced grasses were planted, LEPC did not demonstrate range expansion or increase in population size (Rodgers and Hoffman 2005: 123).”

“The possibility exists that escalating grain prices due to the recent emphasis on generating domestic energy from biofuels,...combined with recent federal budget proposals that would reduce or eliminate CRP enrollments and renewals through FY 2010, will result in unprecedented conversion of existing CRP throughout the Great Plains.”

“Summary of Factor A

The curtailment of LEPC range has occurred throughout large portions of four of the five states occupied by LEPC. Estimates reveal that some 86 percent of the historically occupied range has been lost due to a variety of mechanisms including conversion of rangeland to cultivated cropland, energy development, and habitat fragmentation. In Kansas, the loss of suitable habitat has been offset by the restoration of native grasslands due to implementation of CRP. However, these short-term gains are expected to be negated as CRP contracts expire and the lands are converted to other uses. Rangewide destruction and modification of remaining LEPC habitat continues to occur. Within the next few years, the possible conversion of over a million acres of currently enrolled CRP grasslands to cropland and other less suitable land uses has the potential to destroy or modify some 14 percent of the remaining occupied habitat. Wind energy development with its associated infrastructure development is ongoing and the potential for additional wind energy facilities is substantial within nearly all occupied habitat in all states except New Mexico, where it may impact historical habitat important to linking the New Mexico population to populations to the north. Additionally, the continued loss and degradation of currently occupied habitat in several areas in the form of heavy grazing by livestock, woody plant invasion due to fire suppression, oil and gas development, and fragmentation are rendering portions of the range uninhabitable for the species.”

Conversion of Native Range

“Several LEPC experts have identified conversion of native sand sagebrush and shinnery oak rangeland to cultivation as an important factor in the decline of LEPC populations (p 16).”

“However, estimates of rangeland between 1982 and 1992, for counties specifically within LEPC range, showed no statistically significant change, possibly due to small sample size and large variation about the mean (p 16).”
**Threat reduction.**—Conversion of native range to row crop is the historic mechanism for the contraction of LEPC distribution. As indicated above, conversion of native range has slowed dramatically in the late 1990s, and many acres may revert to grassland in the future as center pivot irrigation wells become cost prohibitive. An examination of the most recent National Agriculture Statistics Service (NASS) geospatial data indicates that native rangeland has increased by more than 1 million acres since 2008 across the EOR. Because it is difficult to assess what data sets were used to determine landcover in 2008 and 2011, it is suggested that there continues to be low levels of sod busting in LEPC range.

**Action.**—NRCS and partners are developing a “tillage risk” model which will further assist in targeting of retaining CRP as grasslands and may assist in identifying landscapes in which to seek conservation easements to ensure longevity of these actions.

**Conservation Reserve Program**

**Quality.**—Ripper et al. 2008 characterized species composition and diversity of grasses planted in CRP in each state. Understanding quality of these plantings is critical to inferring the meaning of expiration and loss of CRP in each of the 5 states within LEPC range (Figure 1). Generally, it was found that most CRP fields in Kansas were the most diverse as a result of CP 25 being the predominant practice applied. Following Kansas with greatest species diversity were Colorado, New Mexico, Texas and Oklahoma. The latter 2 states had a prominence of old world bluestem and weeping lovegrass seedings with low species diversity.

**Targeting.**—While the intent is to cover these topics rangewide, it is clear in the case of CRP that most of the Service’s focus was on Kansas, as such so will this discussion. FSA began prioritizing CRP allocations with regard to lesser prairie-chickens as early as General Signup 26 in May of 2003 using State designated Conservation Priority Areas or CPA (Figure 2). This concept permitted States to designate resource priority areas permitting assignment of additional points for land offered within the CPA under the competitive EBI scoring system for general enrollment into CRP, and CPA1 reflects the Lesser Prairie-Chicken priority area in Kansas utilized during general Signup 26 (May 2003) and Signup 29 (August 2004; Figure 2). The current CPA in Kansas utilized for General Signup 39 (August 2, 2010), signup 41 (March 14, 2011) and signup 43 (March 12, 2012) has a significant area specific for LEPC. Kansas Department of Wildlife, Parks and Tourism population survey data improved the priority areas from entire counties to HUC levels. These early steps focused establishment of native grass covers within the historical Lesser Prairie-Chicken range and have proven to be very beneficial to chicken populations in Kansas.

Additionally, as CRP acreage caps were established and expirations were occurring FSA introduced a Continuous CRP practice SAFE (State Acres for Wildlife Enhancement) for States to focus continuous acres for wildlife benefits. In November 2010, Kansas implemented a new LEPC SAFE Practice with 30,000 acres targeted specifically in narrowly defined areas with threatened habitat based upon expiring CRP in the next three years and existing populations from survey data (Figure 4). In Kansas, a targeting tool was developed in cooperation with Kansas Dept of Wildlife, Parks and Tourism, and Playa Lakes
Joint Venture using best available science on available habitat and LEPC populations (Figure 4). The result was a highly targeted application of 30,000 acres of CRP in areas that yield the greatest conservation benefit (Table 1). Landowners responded to this voluntary program as the 30,000 acre allotment has been exhausted with over 28,000 acres under contract and the balance obligated to pending contracts. Range wide over 125,000 acres of CRP have been newly established or maintained in areas beneficial to LEPC (Table 1). FSA is currently seeking additional allocations of acres and retargeting the areas to address the critically threatened habitat.

**Expireations.**—Since the inception of CRP acreage enrollment increased quickly and has plateaued (Figure 5). Since 1998, there has been a net gain of CRP acreage; most biologically notable of those gains yield from Kansas (11%) and Colorado (7%) (Table 2). There were acreage gains in Texas (3%) as well, but because monocultures are still planted there that increase may not be as biologically important to LEPC. Loss of acreage in Oklahoma is likely negligible to LEPC because of monocultures. However, the loss in New Mexico is more difficult to assess because of the use of both monocultures and native mixes. Since 2008, 11% of CRP has expired across the range (Table 2) with largest expirations occurring in New Mexico and Kansas. Much of the expirations in New Mexico were in Curry County which has traditionally been marginal habitat with low population densities. However, through a combination of proactive practices by NRCS, FSA, and lack of desire to till these marginal lands by producers, many of these expired acres of CRP have been retained as grasslands. An analysis is underway that compares the location of expired fields (2008-2010) to the 2010 NAIP imagery to determine if those fields have been converted to cropland. Currently data analyses have only been completed for Kansas (Figure 6), Colorado (Figure 7), and New Mexico (Figure 8). The results thus far indicated that more 90% of the expired acreage was still in grass, Not only were these acres still in grass cover but were located in areas of significant conservation need for LEPC (see Figures 6-8).

**Threat reduction.**—Because of innovative approaches by FSA in ranking of general CRP there has been a net gain in CRP acres since 1998 throughout LEPC range in KS. Despite recent expirations of CRP, innovative approaches by NRCS through the Lesser Prairie-Chicken Initiative have retained over 86% of those acres in grasslands meaningful to the biology of the species. Moreover, expirations in Texas, Oklahoma, and (to a lesser extent) New Mexico may prove negligible as those fields of weeping lovegrass and old world bluestem converting back to cropland may increase the likelihood of higher quality, more diverse CRP, in the future. Interestingly, recent roadside lek surveys in Bailey County, Texas suggest that even these lovegrass fields provide some benefit to landscape connectivity and providing habitat for LEPCs. In summary, USDA has found innovative solutions to averting the catastrophic losses of CRP that was projected in 2008, and has established the tools and policy to greatly minimize this threat in the future.

**Future actions.**—As mentioned above, the development of a tillage risk model combined with future expirations of CRP acres will enable a highly targeted approach to allocating SAFE acres, possibly CPA targets, and LPCI targeting of enrolling those acres into prescribed grazing practices through EQIP and WHIP.
Over grazing

“While livestock grazing is not inherently harmful to LEPC, levels of grazing that alters the composition and structure of mixed grass habitats historically used by the LEPC can be detrimental.”

“Livestock grazing, particularly overgrazing or overutilization, and related deteriorated range condition is most readily observed through changes in plant composition and other vegetative characteristics (Fleischner 1994, pp 630-631; Stoddart et al. 1975, p. 267). Typical vegetative indicators include changes in the composition and proportion of desired plant species, leading to overall reduction in forage. Plant height and density may decline, particularly when plant regeneration is hindered, and composition shifts to increased proportions of less desirable species. When grasslands are in a deteriorated condition due to overgrazing and overutilization, the soils have less water-holding capacity, and the availability of succulent vegetation and insects utilized by LEPC chicks are reduced (p19).”

Quality.-- NRCS conducted an analysis of Natural Resource Inventory (NRI) data collected from 2003-2006 to assess rangeland health throughout the LEPC range. NRI is a randomized sample of data points across the entire continental US to assess watershed and rangeland health (Herrick et al. 2010). For this assessment of rangeland health, a subset of these data from within LEPC range (n = 610) were used to quantify overall rangeland health (comprised of 17 indicator variables), soil stability, and hydrologic function to address the concerns expressed in 2008. Rangeland health is reported on scale from 1 to 5, and as a “departure from reference condition”, where 1-1.5=none to slight; 1.5-2.5=slight to moderate; 2.5-3.5=moderate; 3.5-4.0=mod-extreme; 4-5=extreme to total departure from reference conditions.

Overall rangeland health for all ecological sites average = 1.79, mean hydrologic function = 1.42, and mean soil surface stability = 1.37. Other variables of interest were Avg plant ht = 1.8 ft (55 cm), bare ground = 22.7%, plant foliar cover = 77.9%, desirable LEPC plants = 36.5% cover, and desirable LEPC shrubs = 11% cover. These additional variables are well within biological needs of LEPC (Hagen et al. 2004). Thus, range conditions for LEPC appear to be reasonable. This does not discount localized issues were utilization may be excessive and not providing adequate cover. However, on the whole, grazing practices appear to be providing healthy rangelands with the potential to provide habitat characteristics suitable for LEPC.

Threat reduction.--Through NRCS prescribed grazing conservation practice (528) there is a high standard for managing utilization rates to maintain or improve watershed health. Moreover through LPCI contracts, 528 must be implemented in a manner that has the needs of LEPC nesting and brood rearing habitat as a part of the objectives. Since 2008, 1,024,691 acres of 528 have been applied across the range (Figure 9), and since 2010, over 520,600 acres of 528 have been implemented under LPCI (Figure 10). Significant acres across the range have benefited from the NRCS prescribed grazing practice.

Future actions.-- An analysis of NRI points (n = 180) from the ecological sites most important to LEPC will provide additional insights to further improve implementation of prescribed grazing within LPCI by targeting specific goals for spatially referenced habitat improvement. Continued enrollment through LPCI will help to ensure improvement and maintenance of rangeland health.

Fire Suppression (Woody invasion)
“With few exceptions, burning of native rangelands was, and continues to be perceived by landowners as destructive to rangelands, undesirable for maximizing cattle production, and likely create wind erosion or blowouts in sandy soils (p29).”

“Tree invasion in native rangeland has the potential to render significant portions of the remaining occupied habitat unsuitable in the near term (p30).”

Quality.—Although the Service did NOT quantify the extent of woody invasion in LEPC range, and suggested that 280,000 ac of prairie would be consumed annually by cedars alone; however, this rate of encroachment has not been verified. There is little question that tree invasion into prairie affects space use by lesser prairie-chickens. Research on greater prairie-chickens (McNew et al. 2011) and greater sage-grouse (Freese 2009, Doherty et al. 2009, 2010) both demonstrate that when juniper canopies reach ~5% use of otherwise suitable habitat diminishes.

Threat reduction.— Since 2008, 379,258 acres of brush management was applied within the range of LEPCs most of which occurred in Texas and was conducted under the guidance of Upland Wildlife Habitat Management (645) Supplement for Texas Zone 1 (dated 2001). An additional, 157,000 acres was treated within LPCI focusing on cedar and mesquite removal (Figure 10). Additionally, 37,500 acres of prescribed burning was applied within LEPC range. Although no direct measure on woody invasion can be measured from these prescribed burns an improvement of range condition would likely have been realized along with any woody control. When combined with partner projects there has been approximately 300,000 acres of eastern red cedar removed from eastern portion of the EOR. Another 300,000 acres of mesquite removal has occurred in New Mexico within the EOR and another 300,000 acres is to be treated in the next couple of years. Combined, these acreages have reduced the threat of woody invasion by 6% of the EOR.

Future actions.— Woody encroachment is a high priority for LPCI and spatial planning and monitoring tools are being developed to quantify the areas of the EOR affected by eastern red cedar and mesquite. These GIS based tools will be available in later 2012 and early 2013, respectively, and will provide an essential tool to target those landscapes within and adjacent to the EOR that will have the greatest conservation benefit to LEPC.

Habitat Fragmentation

Currently, FSA and NRCS programs indirectly promote landscape connectivity. First, assistance to producers that generates stainable agricultural operations ultimately results in working landscapes compatible with LEPC life-history, and keeps them from being converted to residential or industrial uses. Second, maintaining grassland cover (CRP) in prairie landscapes provides connectivity and dispersal corridors. Currently analyses are not available to quantify landscape metrics related to how these programs have maintained or increased the connectivity across the landscape, but a peripheral examination of spatial data provides a qualitative assessment (Figures 6-8).
Future actions.—Combining the tillage risk model, cedar encroachment, and mesquite tools will enable NRCS and partners to identify those landscapes in greatest need of restoration activity, and will ensure that conservation investments are yielding the greatest environmental return.

FACTOR B. OVERUTILIZATION FOR COMMERCIAL, RECREATIONAL, SCIENTIFIC, OR EDUCATIONAL PURPOSES.

NOT UNDER THE PURVIEW OF USDA

FACTOR C. PREDATION AND DISEASE

NOT UNDER THE PURVIEW OF USDA

FACTOR D. INADEQUACY OF REGULATORY MECHANISMS.

USDA Natural Resources Conservation Services has a number of strategies providing benefits to Candidate Species and specifically the LEPC.

Candidate Species Policy.—NRCS policy as it relates to Candidate Species can be found in General Manual 190 Part 410.22 (E)(7)(ii)

NRCS has worked with the Service to develop a conference report for the LEPC. Thus as indicated in the second bullet of GM 190 410.22(e)(7)(ii) NRCS assistance in the Conference Report Action Area will follow the conservation measures for conservation practices as outlined in the Conference Report for NRCS technical assistance (TA) or financial assistance (FA).

NRCS Technical Assistance Strategic Watershed Action Teams (SWAT)

In order to provide additional on the ground assistance in high workload high priority area (Figure 7) NRCS and NFWF initiated SWAT as a means of increasing implementation of conservation practices under LPCI. SWAT positions are NRCS partner positions strategically located to provide technical assistance related to the LPCI including outreach, contracting, and monitoring. These positions provide much needed one on one work with producers in the Initiative area.

Lesser Prairie-Chicken Initiative (LPCI)

NRCS recognizes the long term sustainability of the LEPC is closely tied to sustainable ranching. With that in mind the LPCI is designed to increase the abundance and distribution of the LEPC and its habitat. At the same time, LPCI has the goal of promoting the overall health of grazing lands and the long-term sustainability of ranching operations in the Initiative area. Since FY 2010, the NRCS has hired a Science advisor to provide consistent scientific basis for Initiative goals. Measurable outcomes of the Initiative include:

1. Management and enhancement of the current habitat;
2. Decreased threats to the species from agricultural activities; and
3. Educating the public about the needs of the species.

NRCS is working closely with state agencies to monitor responses of habitat to conservation practices, while state wildlife agencies are monitoring lesser prairie-chicken populations by counts of birds attending lek sites. NRCS has also hired a Coordinator located within the Initiative States to work with NRCS and partner staff to promote a consistent approach to implementation of the Initiative throughout the five state LEPC range.

Future actions.—To ensure consistency in program delivery now and into the future NRCS has held 5 trainings for staff and partners on LEPC ecology, LPCI Conference Report, and monitoring and evaluation. One webinar-VTC was held with over 220 individuals participating, and 4 field trainings with a similar number in attendance. As LPCI matures, additional trainings will be offered to ensure consistency into the future.

FACTOR E. OTHER NATURAL OR MANMADE FACTORS AFFECTING ITS CONTINUED EXISTENCE

Herbicide

“Several studies have shown that shrub removal, primarily by herbicide application, is one mechanism that may be contributing to observed declines in LEPC (p40).”

“In September 2007, the New Mexico NRCS issued Biological Tech Note 53, which provided guidance on herbicide management of shinnery oak.... The guidance was not supported by prairie-chicken specialists, and was not supported by the Service (p41).”

New information.—The data referenced by the Service (p40) evaluated tebuthiron treatments within 1-2 years post-treatment. Recent work that has evaluated some of those same treatment areas for 10-yr post-treatment, provides a different line of evidence (Grisham 2012). For brevity, the data indicate with proper livestock grazing after approximately 5 years post-treatment there are negligible effects of habitat use by LEPC of these areas for nesting and brood rearing. Additionally, the Service references two studies Woodward et al. and Fuhlendorf et al, with regard to the need for shinnery oak cover. The landscape level at which these studies were conducted it would be difficult to discern a treated vs non-treated area of rangeland. Thus, the scale is not an appropriate comparison.

Additionally, the Service failed to reference work from Kansas (Pitman et al. 2005, Hagen et al. 2005) demonstrating the need for a mosaic of dense cover juxtaposed to more open areas in sand sagebrush habitats. Similarly the work of Fields et al. (2006) demonstrated habitats where shrub cover was absent and LEPC performed well in terms of reproductive rates. Granted, that study area had extensive CRP with structure provided by taller grasses and forbs. There is little uncertainty that shrub cover is an important aspect of LEPC life history, but identifying the appropriate amount of high density shrubs is difficult to discern, and anecdotally there appears to be an upper limit of shrub cover.

It is important to note that prescribed fire is not the tool of choice in some portions of the range (although ecologically preferred in many cases), and alternatives of mechanical removal or herbicides can provide a similar perturbation as fire and setback ecological states of shrub communities. Thus,
appropriate guidance on the use of these tools with USDA programs is paramount and has been implemented (Appendix I).

**Threat reduction.**-Both Texas and New Mexico NRCS office have issued new and stricter guidance on the use of herbicides to thin shinnery oak in LEPC habitats to ensure benefits to LEPC and sand dune lizards (see Appendix ). Following these guidelines the effects of tebuthiuron on LEPC will be either benign or beneficial.

**Future actions.**– Continued collaboration with partners to identify the optimum composition of shrub and grass cover for reproductive output of LEPCs. Continue to evaluate existing guidance on the application of tebuthiuron to ensure it is having benign or beneficial outcomes for LEPCs. Monitoring and evaluation protocols under LPCI will facilitate this type of data collection and reporting.

**Collision Mortality (Fences)**

“Fences, power lines, or other wire structures are an unnatural threat to prairie grouse that, until recently, were seldom perceived as significant at the population level (Wolfe et al. 2007). (p42)”

“With between 14 and 42 percent of adult LEPC mortality currently attributable to collision with human-induced structures, Wolfe et al. (2007, p. 101) assert that fence collisions will negatively influence long term population viability for LEPC (p43).”

“To quantify the magnitude of threat due to construction of new fencing in LEPC habitat, the Service obtained information from the Oklahoma NRCS regarding the construction of new fencing through Federal cost-share assistance in Fiscal Year 2006 in occupied LEPC counties (Zetterberg 2007). In total, approximately 177.3 km (110 mi) of new fencing was constructed in these counties in a single year (p43).”

“Although collisions with fences is considered a threat to the survival of LEPC, additional information is needed to fully quantify the magnitude of this ongoing activity and its impact on LEPC rangewide (p 43).”

**Additional information.**– The most important point of this discussion is recognizing that “the magnitude” of this threat is yet to be confirmed with rigorous science. There is little question that lesser prairie-chickens and other grouse species collide with fences, population level effects have not been quantified, not even the research out of Oklahoma. Additionally, work from Kansas (Hagen et al. 2009) showed that collisions with fence or transmission lines comprised ~5% of the mortality rate, and if unknown mortalities were assumed to be associated with collision it would have been approximately 10%. Such numbers, appear to be inconsequential to overall population dynamics, as nest success and chick survival are the factors that drive population dynamics. However, there are likely localized high risk fences that may pose a threat to a local population and where that is known the fence should be marked or removed, if possible.

**Threat reduction.**– While NRCS has been committed to maintaining CRP as grassland, often that practice requires fencing, as does prescribed grazing from time to time. Through LPCI any new fence constructed
½ mile from known lek sites, and existing fence within that same radius shall be marked. To date, 116 miles of fence have been marked and 40 miles removed through NRCS contracts, and another 208 miles marked and 80 miles removed through partner efforts. Using estimates from sage-grouse strike abatement rates (Stevens et al. 2011) and from marking data above it is estimated that between 1,400 and 1,800 collisions would be prevented. However, these calculations assume similar strike and abatement rates to that of sage-grouse near leks which generally are much larger than LEPCs, and it is reasonable to assume reduced strike rate (perhaps 50% less) and would conservatively estimate between 700 and 900 collisions were prevented. It is important to note that strike rates and abatement rates are currently an untested assumption of LEPC biology.

Future actions.— Collaboration is underway to rigorously examine population level effects of fence mortality, and effectiveness of marking fences for LEPC. These data will provide a clearer understanding as to the risk involved and quantification of threat reduction through collision reduction.

Conservation Actions

NRCS efforts to conserve LEPC have varied since becoming a candidate for listing in 1998. New Mexico has the longest history of conservation actions (See Appendix). However, in 2010 these efforts were unified and brought into the strategic framework of LPCI. These efforts were further improved by collaborating with the Service on developing the CR to ensure conservation actions were either benign or beneficial to LEPC ecology. Since 2010, more than 600,000 acres within high priority LEPC habitats have benefited through LPCI. As mentioned above, when examining all conservation efforts a much larger landscape is encompassed by sound conservation.

SUMMARY OF THREATS

“The most serious threats to the LEPC are loss of habitat from conversion of native rangelands to introduced forages and cultivation, recent and anticipated conversion of CRP lands to cropland, cumulative habitat degradation caused by inappropriate livestock grazing practices, wind energy development, oil and gas development, woody plant invasion of open prairies due to fire suppression, inappropriate herbicide applications, and habitat fragmentation caused by structural and transportation developments. Many of these threats may exacerbate the normal effects of periodic drought on LEPC populations. In many cases, the remaining suitable habitat has become fragmented by the spatial occurrence of these individual threats. Habitat fragmentation can be a threat to the species through several mechanisms: remaining habitat patches may become smaller than necessary to meet the requirements of individuals and populations, necessary habitat heterogeneity may be lost to areas of homogeneous habitat structure, areas between habitat patches may harbor high levels of predators or brood parasites, and the probability of recolonization decreases as the distance between suitable habitat patches expands. Existing regulatory mechanisms have not been adequate to halt the decline of LEPC populations and habitat.”

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Status report on USDA Programs to benefit Lesser Prairie-Chicken

**Threat reduction.**—An examination of all the conservation actions occurring within the LEPC EOR indicates the cumulative effect is significant when compared to the qualitative projections provided in 2008. Data are reported in the context of the 2008 assessment which suggested as much as 14% of the species range would be lost to CRP expirations alone. Contrary to those predictions there has been a 22 to 28% gain in the EOR. Basically brush management as currently applied is negating advances in woody invasion. This analysis does not include losses to energy development or transmission corridors but those data could be easily added to this table for a greater understanding as to how much has been lost or gained.

Table of Losses and Gains of LEPC Estimated Occupied Range

<table>
<thead>
<tr>
<th>Threat</th>
<th>Change in EOR %</th>
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<tbody>
<tr>
<td>Sod busting</td>
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<tr>
<td>CRP expirations</td>
<td>−2 to −5%</td>
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<tr>
<td>Woody encroachment</td>
<td>−1 to −4%</td>
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<tr>
<td>Total Loss</td>
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<tr>
<td>Brush management</td>
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<tr>
<td>Gain in EOR since 2000:</td>
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<tr>
<td>Gross gain</td>
<td>+31%</td>
</tr>
<tr>
<td>Net change</td>
<td><strong>+22 to +28%</strong></td>
</tr>
</tbody>
</table>

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Figure 1. Distribution of CRP acres throughout the range of the lesser prairie-chicken acres are depicted as acre per township.
Figure 2. An example of priority ranking of CRP contract areas from Kansas in early 2000s, LEPC areas are primarily CPA-1 and indirectly approximately half of CPA-8.
Figure 3. An example of priority ranking of CRP contract areas from Kansas in 2010 and beyond, CPA-1 is specific to LEPC while approximately half of CPA-2 also provides indirect benefits to LEPC.
Target Areas for 30,000-acre Lesser Prairie-Chicken SAFE in KANSAS with Expiring CRP 2012-2015

Legend
- Target Areas
- LEPC Current Range
- SAFE 38E Parcels

CRP Expiration Year
- 2012
- 2013
- 2014
- 2015

Landcover
- Water Body
- Cropland
- Developed/Other
- Woodland
- Grassland/Shrubland
- Riparian

Figure 4. An example of using species and habitat data to target SAFE allocations in Kansas.
Figure 5. Total CRP acres enrolled within the range of LEPC reported by state.
Figure 6. Analysis of expired CRP fields in Kansas as compared to 2010 NAIP imagery, indicates the significant conservation effort pursued to maintain these areas as grasslands appears to be working.
Figure 7. Analysis of expired CRP fields in Colorado as compared to 2010 NAIP imagery, indicates the significant conservation effort pursued to maintain these areas as grasslands appears to be working.
Figure 8. Analysis of expired CRP fields in New Mexico as compared to 2010 NAIP imagery, indicates the significant conservation effort pursued to maintain these areas as grasslands appears to be working.
Figure 9. Spatial distribution of NRCS prescribed grazing practice (528) implemented within the high priority areas of LEPC.
Figure 10. Spatial distribution of NRCS brush management (314) implemented within the high priority areas of LEPC. Note the concentration of practice implementation along the eastern and western portions of the range where cedar and mesquite, respectively, are a primary resource concern.
Table 1. SAFE acre allocations and contracts within LEPC range across the 5 state region, 2012.

<table>
<thead>
<tr>
<th>State</th>
<th>Allocation</th>
<th>Contracts</th>
<th>Acres</th>
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<tbody>
<tr>
<td>Colorado</td>
<td>21,500</td>
<td>50</td>
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<tr>
<td>Kansas</td>
<td>30,000</td>
<td>255</td>
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</tr>
<tr>
<td>New Mexico</td>
<td>2,600</td>
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<td>2,600</td>
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<tr>
<td>Oklahoma</td>
<td>15,100</td>
<td>63</td>
<td>6,814</td>
</tr>
<tr>
<td>Texas</td>
<td>78,400</td>
<td>354</td>
<td>76,840</td>
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</table>
Table 2. Change in enrolled CRP acreage within the range of LEPC from 1998-2011 and 2008-2011. Net change of CRP grasslands adjusted for expired CRP fields that remained in grass cover per 2010 NAIP Imagery. *Data analysis is still in process for Oklahoma and Texas. Based on completed analyses of the other 3 states it is anticipated that the net loss in CRP grasslands will be less than what is depicted below.

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<tbody>
<tr>
<td>Colorado</td>
<td>56,433</td>
<td>7%</td>
<td>-55,978</td>
<td>-6%</td>
<td>-15,534</td>
<td>-2%</td>
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<tr>
<td>Kansas</td>
<td>189,920</td>
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<td>-252,827</td>
<td>-12%</td>
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</tr>
<tr>
<td>New Mexico</td>
<td>-94,636</td>
<td>-19%</td>
<td>-111,945</td>
<td>-22%</td>
<td>-2,799</td>
<td>-1%</td>
</tr>
<tr>
<td>Oklahoma*</td>
<td>-16,485</td>
<td>-2%</td>
<td>-71,602</td>
<td>-10%</td>
<td>-71,602*</td>
<td>-10%</td>
</tr>
<tr>
<td>Texas*</td>
<td>43,523</td>
<td>3%</td>
<td>-183,071</td>
<td>-10%</td>
<td>-183,071*</td>
<td>-10%</td>
</tr>
<tr>
<td>Total</td>
<td>178,755</td>
<td>3%</td>
<td>-675,425</td>
<td>-11%</td>
<td>-298,149</td>
<td>-5%</td>
</tr>
</tbody>
</table>