GREATER PRAIRIE-CHICKEN IN THE SMOKY HILLS, 2008-2014

I have had the unique opportunity of spending six out of the last seven springs in the Smoky Hills around Salina locating prairie chicken booming grounds (leks), trapping male and female prairie-chickens, and for three summers, chicks and relocating some to Missouri or Illinois. This is a summary of the work and my observations of the population and habitat in the area. When the Missouri Department of Conservation (MDC) began their project, I was at the end of my 34 year career with them as their only grassland biologist. After retiring in 2010, I continued as a volunteer, and in 2014, I coordinated Illinois Department of Natural Resources (IDNR) translocation as an independent contractor because of my familiarity with the area, landowners and prairie-chicken population. I've hunted pheasants and quail around Salina with my brother since 1965 so I was familiar with the geography but hunting pheasants is a lot different from finding prairie-chickens and booming grounds.

Faced with disappearing greater prairie-chicken populations, Missouri Department of Conservation established a Prairie-Chicken Recovery Team in 2005 to look into solutions. With only one significant population left, at Taberville Prairie, and the realization that prairie-chickens were not persisting on prairie that was only burned, hayed or idle, we decided to reintroduce grazing that was removed in the 1990s. We particularly wanted to experiment with a new grazing concept, "patch-burn grazing," and to compare the native Taberville flock's response to one we hoped to reestablish using Kansas birds at Wah-Kon-Tah (WKT) Prairie near El Dorado Springs. WKT was not particularly well located for prairie-chickens, being almost completely surrounded by forests, but it was the largest publicly owned prairie, nearly 4,000 acres between TNC and MDC holdings. WKT had an historic gpc population of 60-70 birds. Taberville Prairie and WKT Prairie were thirteen miles apart, close enough that birds have interchanged, an important factor in maintaining genetic viability.

Illinois has two greater prairie-chicken populations about 27 miles apart. These birds interchange, but genetic depression was noted in the early 1990s when the population shrank to 40 males. Genetic depression can be tested in laboratories, which was done, but the first indication was when only seven to nine eggs of an average 13-egg clutch were hatching from several located nests. IDNR introduced Kansas, Nebraska and Minnesota birds in the mid-1990s to re-invigorate the gene pool. After these introductions, hatch rate returned to 12 of 13 eggs, and the population built back to about 200 hundred birds on the two sanctuaries of 2,300 and 1,300 acres. Twenty years later, the population and hatch rates began to decline, indicating a need for another genetic infusion. Both the Missouri and Illinois populations and the available land area that can support prairie-chickens are so small that periodic genetic infusion will probably be necessary unless or until each state acquires enough land, and appropriately manages it, to support a genetically self-sustaining population.

This portion of the tallgrass prairie was once the heart of the historic greater prairie-chicken range (both states claim over a million birds about the time of Euro-American settlement). They continued to do well after settlement on grazed prairie but declined as tractors replaced horses, oxen, and mules for agriculture. Before then, grassland was needed to fuel draft animals (it took about two acres of grass for each acre farmed) but not for tractors. Agriculture intensity increased until the early 1930s when Roosevelt introduced the New Deal. To bolster crop prices during the Depression, much cropland was

planted to timothy, redtop, smooth brome and annual lespedeza from Indiana to Kansas. Prairie-chicken populations dramatically increased in the new nesting and brood cover which was cut for seed, hayed or grazed in late summer. Intensive agriculture returned after WW II, and populations again plummeted, recovering somewhat during Soil Bank seedings; however, tall fescue was gaining increased promotion from Extension and USDA by then. Tall fescue provides extremely poor habitat for grassland birds, providing poor nesting cover and eliminating broadleaf plants that produce seed and insects for broods and adults. Tall fescue continued to increase as a pasture grass, seed was harvested for lawns and conservation practices, and rapidly spread into all remaining native prairie, draws, road ditches, and field borders choking out practically all other grasses and forbs and insects that feed on them. Prairie-chicken, as well as bobwhite quail and other grassland bird, populations plummeted.

Both states initially thought that buying remnant prairies or agricultural land and restoring native grass cover would provide prairie-chicken habitat and keep them from extinction in their state. However, public grassland managers were disappointed to find that prairie and planted native grasses in rainfall regimes above 25 inches result in cover that is too tall and dense for chickens. Jerry Horak, long-time prairie-chicken researcher for Kansas Wildlife and Parks, used to say, “Prairie-chickens will use anything they can hide in, run through, and see over.” A prairie-chicken’s eye is 17 inches high, so anything taller than that has little value for nesting, brood-rearing, or roosting. Grazing is the main solution for reducing height and density. Periodic burning helps reduce old growth accumulation but not height and density. Illinois has also been very successful planting redtop, timothy and smooth brome and managing it through burning and high (14”) clipping to simulate the stubble from seed harvest of the 40s, 50, and 60s. Population densities are higher using these grasses and practices (10-30 acres/bird) than in grazed prairie (53 acres/bird).

Why should Kansas ranchers and Kansas Parks and Wildlife care what happens to Missouri’s and Illinois’ chickens and why do those states try to maintain populations? Maintaining prairie-chickens in as many different locations as possible is critical to maintaining viable genetic diversity. Historically, when the population was contiguous, prairie-chickens interchanged naturally—juvenile males disperse in the fall and juvenile hens disperse in the spring. However, with literally oceans of uninhabitable landscape (trees, soybean fields and fescue pastures) separating remnant populations, island populations became genetically poor as well as targets for local predators. Also, each state is researching habitat management methods that hopefully will help sustain nesting and brood-rearing and have application in other states. Thus, the key to keeping greater prairie-chicken from someday being put on the threatened or endangered species list even where they are today doing well, may be the information that each state gathers and the success they have in maintaining populations.

The problems for eastern states in maintaining gpc is that it takes many more acres than originally thought and land in Illinois and Missouri has become extraordinarily expensive and developed. Iowa, Minnesota, and Wisconsin have the same problems maintaining their gpc populations. Currently, Kansas, Nebraska, and South Dakota populations are adequately large and stable and are the sources for genetic infusion to states trying to stave off extirpation.

TRANSLOCATION AND TRAPPING AREA

Four Missouri Department employees (Max Alleger, Brent Jamison, Frank Loncarich, and Matt Hill) and I came to Salina mid-March, 2008, to search for booming grounds referred to hereafter as leks, a European word for display areas of several grouse species. We counted the number of males on each lek to get an idea of the greater prairie-chicken population. Our initial focus was on the Smoky Hill Bombing Range (SHBR) and ranches and rangelands immediately surrounding it.

We tallied numbers and determined that we could limit our male removal from any one booming ground to between 10 and 20 percent without impacting the population, being careful not to take both the alpha and beta males (two most dominant males) from any lek so not to disrupt the social order of the lek. The number of males on leks in March is usually much higher than in April due to juvenile and non-territorial males visiting the lek in March that are elsewhere by April, thus you may find fewer males on one of your leks in April or May than I listed for it in our March counts. This does not mean that we took more than the stated quota of 10-20 percent which was based on the March count.

Our limit of males and hens on SHBR was 15 each. The rest had to come from ranches in Ellsworth, Lincoln, Ottawa, and Saline counties. Several landowners were fortunate encounters. I met Brent Laas on Reece Road one March morning. He suggested places to look in Glendale Township, Saline County, where I found a very large lek on Miller Road on a wheat field owned by St. Louis attorney Bruce Springer. Bruce has been gracious in letting us remove birds for both Missouri and Illinois. I met Gordon McClure and Hal Berkley, who own many rangeland tracts on which I found leks. They suggested I also contact Dick Diedrick. One thing led to another, as they say, until I'd contacted and gotten permission to trap on Terry Burnett's, Roger Witte's, Calvin Berkley's, Donita Shike's, Leon Hannebaum's, Dan and Dale Rosebrook's, Frank and Allen Ahlquist's, R.L Farms (through Wendell Suelter), Oscar Larson's, Kelly Zuker's, Middleton Thompkins' land leased by Jeff Shafer (now Chad Koehn's land), and Donald Lancaster's land (also leased by Shafer) all north of I-70.

At the same time, we met and got on some of the Jack Vanier's CK Ranch holdings, Chris and Bill Hoffman's, Joe Schlessiger's, Wayne Shulz's, Joseph Soukup's, John Vanek's, Trace Walker's, John Patrick's, Stanton LaForte's, Steve and Virginia Burr's, and the late George McCormick's lands south of I-70.

The first three years of Missouri's translocation project, we took up to 50 males in the spring and put radio transmitters on and released as many hens for recapture with chicks (total 50 in combination) in the summer. When studies noted poor survival of translocated chicks during the third year of summer translocation, Missouri changed to taking hens in the spring for the last two years of the project. Illinois will do the same during their three-year project. (Establishing a new population requires introducing birds to an area for five years whereas infusing genetics into an existing population requires only three according to the Prairie Grouse Technical Council's guidelines.)

Hens are less tied to any one lek, in fact often visit several leks within a ten-mile area so we were less strict about only taking as many hens as cocks from a lek. However, we were very careful not to exceed the number of hens as males from a general geography of leks. For example, if four leks within a four section area contained leks of 12, 15, 30, and 18 males we took no more than 2, 3, 6, and 3 males from

each respective lek but may take more hens from a smaller lek and fewer from a large lek for a total of 14 from the four-square mile area. One of my criteria when contracting with Illinois DNR was that they follow the same protocol the Missouri team established for itself.

Table 1 shows the total number of male greater prairie-chickens censused during each year of trapping. This is not the total number of males in the area because we did not census areas where we could not trap e.g. each county has a long-term Kansas Wildlife and Parks census route and SHBR conducts its own census. Also, many leks may have just a few birds and are often not found, and large areas without county roads, with hilly terrain, or tall vegetation make leks difficult to find and males hard to count from the ground.

Once we had male counts with which we were comfortable, we divided the area into four general geographies and established limits not only for individual leks but for the separate geographies. These were each side of Tescott north of 18 highway; Glendale Township; south of I-70 and north of highway 140; and south of highway 140.

Table 2 shows the counts for 2012 and 2014, the maximum quotas of males and females for each lek, and total number taken from each lek. I felt very good about how well we were able to spread the take over the entire geography. This often required moving traps or nets daily because quotas were reached on a lek.

Males were trapped and shipped in March and hens, mostly in April. We found that males are susceptible to heat and adrenalin stress so we try to only capture, handle and ship them when daytime temperatures are below 65 degrees. That limits us mostly to March. Hens don't show the same stress and come into the lek more consistently in April. So we may set up for males on a lek, reach our quota, move to another for more males, and come back in April for hens.

CHARACTERISTICS OF LEKS

Leks occurred on rangeland and cropfields, the latter being mostly in wheat. Wheat normally hasn't grown much in March so we could set up without harming the wheat. Wheat growth often surges in April so we were either much more careful to limit our access to foot traffic, drop nets instead of trap arrays, or didn't trap them for hens in April. Wheat field leks tend to have more males than rangeland leks probably because visibility for displaying is less limited on wheat than on rangeland. The Widgeon/Schlessiger and Springer leks routinely contained 33-44 males each. By late April, wheat growth limits cock visibility and the males often relocated to more open sites nearby.

Rangeland lek sites may be a mineral feeder site or a rocky knoll where vegetation is short and sparse but only large enough to accommodate 6-12 males. Diedrick's Thompson lek is an exception – a high, open ridge regularly containing 25-35 males.

RANGELAND AND GPC HABITAT

While searching and trapping chickens, I visited with several ranchers about their management. My knowledge of prairie-chicken habits and habitat, observations of population densities and locations, and information gathered from landowners gave me an opportunity to make some general conclusions

Grazed native rangeland is the primary habitat in Kansas but birds may use bromegrass CRP and hayland as they do in Illinois. Lesser prairie-chicken studies further west show use of the outer 50 feet of native grass CRP for nesting particularly if it adjoins native rangeland. Native rangeland is preferred brood habitat if it contains native forbs and some overhead cover. Greater prairie-chicken probably do the same. Ungrazed grass tends to be too tall to attract hens and too dense for them to get chicks around but hens can probably get chicks to the outside where better brood cover is available if she nests not too far from the edge. During summer night-lighting for hens and checks, we occasionally found them in CRP but only where vegetation height and density was limited by poor soil or the composition was predominantly little bluestem and sideoats grama (shorter species).

The best populations are on rangeland that is moderately stocked either year-round or seasonally. Either seems to work well. What doesn't seem to work is intensive rotation grazing (e.g. management-intensive grazing or mig). Two ranches I've watched use some form of mig and the lek on one has disappeared and the lek on the other is decreasing. This conforms with studies on grazing systems in south-central North Dakota in which prairie grouse (sharptails and prairie-chickens) and waterfowl declined and eventually abandoned nesting on intensive rotation grazing pastures but not on season-long or twice-over rotations. It could be due to a lack of vertical vegetation (structure) for nest initiation in April or the stock density during nest initiation and incubation which can discourage nesting or trample nests. Hens seek residual grass and forbs between 6 and 14 inches to build nests in April so if vertical residue from the previous year is missing, they will not nest there. At stock density of 1 animal per acre there is a 20 percent loss to trampling; at five animals per acre all nests will be trampled within three days of stock entering a paddock.

I did not talk to the ranchers using mig or some form of it to learn if their stock density is anywhere near this. Mig produces more uniform cover which generally isn't preferred by grassland birds. Brood cover can also be a problem both too little and too dense.

Summer thermal protection is critically important for chicks, much more so than winter thermal cover. Wisconsin studies have shown elevated chick mortality when temperature exceeds 80 degrees F. if they cannot find thermal protection, i.e. shade. Tall forbs help but sometimes they need small colonies of shrubs such as leadplant, buckbrush, false indigo, dogwood, or plum. Woody cover should not exceed 1 to 5 percent of the landscape, average 3-7 feet tall and may be in fencerows, ditches or rock outcrops. Pastures that were richest with leadplant, and thus good for broods, were Oscar Larson's, Dick Diedrick's, Donita Shike's, Donald Lancaster's, Kelly Zuker's, and Trace Walker's. I'm sure there were others that I didn't have an opportunity to look over.

Fences and power lines are serious threats to adults. Oklahoma and New Mexico studies show lesser prairie-chicken hen mortalities as high as 57 percent due to wire collisions. Fence collisions normally

occur when birds are standing near a fence and are flushed by a passing threat (hawk, coyote, or vehicle). Lesser p.c. tend to flush at lower angles than greater p.c. but wire collision mortality has been documented on greaters around Kanopolis Reservoir and in Missouri. New fences may be a greater threat than old fences because the old brush and grass growing in the fence helps chickens know where they are. Old vegetation is usually cleared when new fences are built and takes time to grow back so new fences are a greater threat. Also, contractors tend to build fences higher than were the old ones. Keep top wires no higher than 44" to 48". Another solution that is used very effectively in Oklahoma and on public land in Missouri is to mark two out of the top three wires. Vinyl undersill siding cut in three to four inch sections works well and have reduced fence collisions on lessers in Oklahoma and New Mexico to practically zero. We have not observed any fence collisions in Missouri where markers have been installed. Vinyl strips are relatively cheap (about $100/mile) and easy to cut. A drawback is they melt like Velveeta cheese during prescribed burns. Missouri's Master Naturalist chapters have cut metal sections to replace the vinyl sections where burns have melted the vinyl ones. The metal sections are more expensive and slower to install but just as effective and last longer. They make the neighbors talk but they work.

A few Smoky Hill ranchers burned during the seven years. These ranchers or their managers told me they try to burn every 5-6 years but recent droughts have forced them to stretch it out. While burning isn't as common in the Smoky Hills as the Flint Hills in eastern Kansas, it still is important especially for cedar control. One can easily see which properties have not had fire in a very long time by the amount and size of cedars. Chicken use of pastures with cedars really drops off or they are abandoned completely.

Burning is important for maintaining healthy prairie and prairie-chicken habitat but burning changes grass dominance from little bluestem to big bluestem and indiangrass. Big bluestem and indiangrass get taller than little bluestem so are not as desirable for chickens but moderate grazing will usually result in the preferred nesting height. There is no residual for nesting the year of the burn so hens have to move elsewhere to nest, but renests (nests that occur after the first attempt was destroyed by predators or other factors) may be in new growth in June.

Missouri and Illinois conservation agencies burn to maintain grassland habitat. We use patch-burn grazing on both native prairie and planted native warm-season grasses. This involves burning 1/3 to ¼ of a pasture each year. Cattle selectively graze the burned portion (patch) the year of the burn but graze it less in following years if another 'patch' is burned each year. Thus grazing intensity shifts around the pasture. Prairie-chickens use unburned patches for nesting and burned patches for broods. Patch-burn grazing has shown great results everywhere it has been used, even in areas of lower rainfall than the Smoky Hills. It also shows promise for helping with the problem of too much burning such as in the Flint Hills where extensive annual burning is believed to be a significant factor in prairie-chicken and bobwhite quail population declines.

The highest densities of birds I observed during the last seven years were on or associated with rangeland that was moderately grazed and had lots of native forbs (broadleaved plants) especially leadplant, western ragweed, and pasture rose. Pastures in which I observed the best forbs were Dick

Diedrick's, Delores Bachofer's, Donald Lancaster's, Oscar Larson's, Bruce Springer's, Trace Walker's, and Kelly Zuker's but forbs were also notable in Calvin Berkley's, Gordon McClure's, Roger Witte's, and Middleton Thompkins'. Those on which I did not observe good forbs or on which I witnessed or saw evidence of spraying were Rosebrook's, Schlessiger's, and Worcester's. There were still lots of chickens in these pastures but densities were lower. Forbs are critical for insects which are critical for the first six weeks of life of chicks. Few forbs means few insects and poor chick survival. Chicks may either starve for lack of insects or be forced to travel more to find them which exposes them to predators or elements.

Greater prairie-chicken studies in Illinois and Missouri have shown heavy use of soybeans by chicks. I question whether soybeans really are that valuable for bugs and chicks or just a cool environment with overhead protection. It was interesting to note while night-lighting hens and chicks in Kansas that not once were they found in soybeans. Thus, I believe that soybeans are used in Illinois and Missouri only because we lack forb-rich native pastures or weedy fields and soybeans are used as a poor substitute.

A potential brood cover that intrigues me is annual forage crop 'cocktail' mixes that are being used for late summer grazing for grass-fed beef. Perennial grasses and legumes, warm or cool-season, don't have the energy to maintain high livestock gains after the midpoint of the summer so grass-fed graziers are experimenting with mixtures of summer annuals. This could be great for broods in June and July and for steers, heifers, and cows in late July-October. A suggested mixture is in the recommendations section.

WEED CONTROL

I observed aircraft or large ground rigs spraying native pastures in the spring. I'm not sure what the target was, maybe musk thistle, but any broadleaf herbicide will damage important native forbs important for chick survival and adults feed on insects and green browse in the summer and forb seeds in the fall and winter.

Musk thistle is not very competitive and is uncommon in well managed rangeland. It mainly occurs around windmills, mineral feeders, and in winter lots due to heavy disturbance and low competition. Nevertheless, many counties insist landowners control it and fine them or the county weed officer will spray it and bill the landowner. Such action isn't warranted but to avoid fines or bills, I suggest spot spraying observed rosettes in the fall when many forbs are dormant instead of broadcast spraying pastures. The herbicide Milestone is softer on many forbs than other choices such as Tordon 22K or Grazon P+D. Musk thistle has largely been controlled in Missouri by the introduced head weevil and rosette weevil but maybe Kansas hasn't introduced them yet.

If spraying for other broadleaves in rangeland, please don't, or spot spray target weeds. There is no peer-reviewed, university research that shows spraying rangeland for broadleaves pays. There is chemical company propaganda that says it does, but I think we all know what that information is designed to do, sell herbicide. Livestock eat a lot of broadleaves, they are often higher in protein and minerals than grass, and bring a lot of P, K, and other minerals to the surface from deep in the soil where it can be used by shallower-rooted grasses. The only broadleaf weed that should be of serious

concern is sericea lespedeza. A grassy weed that should be spot-treated is Old World bluestem. Phragmites or Chinese plumegrass has shown up in some drainages and should be treated, too.

PRAIRIE-CHICKEN POPULATION INCREASE AND DECREASE

The sudden prairie-chicken population increase several years ago was in large part due to a lot of cropland being enrolled in CRP. Most of it was seeded to native warm-season grasses (big bluestem, indiangrass, little bluestem, switchgrass, and sideoats grama) with some native forbs or alfalfa. Such plantings are weedy for the first few years and are brood factories because bugs feed on weeds and quail, pheasant and prairie-chicken chicks eat lots of bugs. Weeds are outcompeted by perennial grasses as the plantings age so prairie-chicken, pheasant and quail populations in CRP gradually decline.

Favorable weather during incubation and hatching (May and June for chickens) is the main other reason for population increases. Weather was very favorable when we trapped and returned for hens and chickens in 2008 and 2009. We noted heavier pasture vegetation while netting chicks in 2010 and chick to hen ratio was down. This may have been due to loss of some nests to heavy rain but was most likely due to hens losing chicks in heavy vegetation. Cool, wet weather during and right after hatching can also contribute to chicks becoming wet and chilled.

We stopped netting chicks after the summer of 2010 so I don't know how conditions were in 2011, 2012 and 2013. Lek counts the springs of those years were stable but that doesn't always tell much about hatching and chick survival for a couple years.

East and Southeast of SHBR. Counts in spring 2014 showed decreased numbers (Patrick 1 & 2, LaForte, and Dogtown-McCormack) on the east side of the Smoky Hill Bombing Range. The birds southeast of the SHBR, the Laforte lek in particular, are closely tied to conditions on the Range. I noted tall, heavy grass on the east side of the Range owing to frequent burning and no grazing. More of the area on the east side is being hayed instead of grazed. Haying is also not good for chickens. Otherwise the private rangeland in this area (Patrick, Contreras, Olean, Neywick, etc.) looked pretty good with some tree removal but there was also some very poor condition rangeland in the area. Rangeland farther east is very poor with severe cedar infestations and poor management so populations on the east side of the range are reflective of the ranch condition on the aforementioned lands or the east side of the Bombing Range.

I-70, Hwy 140. This area (Walker and Burr leks) has been declining since 2010 and I'm not sure why. Trace Walker's lek in section 35, Spring Creek Township, averaged 20-22 males but was not active spring 2014. Range management appeared good with some burning but some of the good rangeland intermingles with not-so-good range and severe cedar and hedge infestation. Also, the native grass appears very heavy in many of the burned pastures, perhaps too heavy for good nesting and brood cover.

I found very few leks west of the Brookfield Road from the time we started in 2008 despite the area looking like very good chicken habitat. It is somewhat difficult to census due to lack of roads so there may be more than what I found.

Garfield Township, Ellsworth County. We found leks here from the beginning in 2008 but we never had to go that far west to get birds. I continued to census it every year. The population has remained stable to perhaps increased from 2008, this despite relatively severe drought. Tree removal by Alan Grothusen and others will help increase usable space for chickens and reduce avian predation. We took a few males and hens on Arrow and DeBerg, leased by Alan, this past spring.

West side of the SHBR. This area (Vanier, Hoffman, Schulz, Widgeon-Schlessiger, and Vanek) has been stable but was down 20 percent this year. We trapped the area in 2008-2011 but not in 2012 because the early spring caused the wheat, particularly on Widgeon-Schlessiger (got its name because there were large numbers of widgeon ducks amid the prairie-chickens when Brent Jamison first found it), was too tall to trap without risking damage to the wheat. This has been a very stable lek of 33 to 45 males throughout 2008-2014. Birds are probably associated with Vanier rangeland to the east and Schlesiger and Hoffman rangeland to the south. There are several smaller leks on these lands as well.

The Vanek lek was very good in 2010. We put transmitters on several hens, but all the hens were dead when we returned that summer, apparently due to a hail storm. Lek numbers have never returned to the pre-hail level.

Glendale Township, Saline County. This area has been stable from 2008 through 2014 with only a slight decrease between 2012 and 2014. There have been some shifts from leks which made it look like a decrease, for example, Terry Burnett's lek of 15-19 on his alfalfa/wheat field disappeared but I think some moved west to McClure's rangeland Section 15 and maybe some went east where I don't count leks. McClure's Section 15 has two and sometimes three leks which have been steady to increasing. Rangeland condition on Section 15 is remarkably good considering it is a year-around cow-calf pasture and has increasing cedar and hedge which are small right now but need to be cut. Prairie-chickens on this section may have benefited from Schoshke's tree removal and burn, and Worcester's burn during the period although Worcester also aerial sprayed which wasn't good for brood habitat.

Bruce Springer's lek is very stable at 34 birds. We removed males and hens from it each year except 2012 when the wheat was too tall to trap. There is a small lek in the rangeland half section to the west but we only trapped it for hens in 2014 so we didn't have to get on the wheat in April. The pasture, leased by Steve Donley for replacement heifers, is excellent brood habitat.

Roger Witte's lek is on a wheat field along the Lincoln-Saline County line. It was only 8-10 males when I found it in 2008 but increased to 18-24 in years since and has been very stable. We've removed males and hens since 2009 with no change in numbers. Hal Berkley's Walk-in-Area and the old R & L Farms property, managed by Wendell Suelter, have leks but have fluctuated. We removed males and hens from these only in 2009 and from Wendell's lease in 2014. West in Lincoln County is the Rathbun lek which has had 18-19 males and we trapped a few over the years. Oddly, it wasn't active in 2014. Rangeland to the northeast is leased by Alan Larson and looks very good for chickens so I can't explain the disappearance of the Rathbun lek. Perhaps it was due to the loss of CRP on R & L Farms to the south or maybe the corn stubble was too tall for booming so they found another site that I didn't find.

North of Tescott. There is excellent rangeland and leks north of Hwy 18 in Ottawa and Lincoln counties. Dick Diedrick, Kelly Zuker, Calvin Berkley, Donita Shike, Middleton Thompkins (now Chad Koehn's), Dan and Dale RosebrookMike Cole, Donald Lancaster, and Leon Hannebaum properties have had excellent leks. Populations are stable on moderately grazed rangeland but declined on intensively, rotationally grazed rangeland (discussed earlier). We've taken several birds off some of these and are very grateful to the landowners and Jeff Shafer for granting us access.

I compliment Hal Berkley, Dan and Dale Rosebrook, Alan Grothusen, and others for tree removal on their properties increasing the amount of usable area.

Other sites. I also located leks and continue to census around Westfall, northeast of Ada, in Culver and Bennington Townships, Ottawa County, and southwest of Kanopolis Reservoir just to track area populations.

PRAIRIE-CHICKEN DECLINE

Some of you have asked why the greater prairie-chicken population declined--was the winter too cold or did they not have enough winter food? Chickens are very hardy when it comes to winter. They do well clear into Canada where winters are much more severe. They also aren't dependent on agricultural grain, although they will eat what's available. The main reasons for decline are lack of quality nesting and brood cover, heavy nest predation, and poor chick survival. High rainfall, and very cool or very hot temperatures at the peak of hatch (late May-early June) can also contribute to excessive chick mortality.

The reasons why populations were high in the first place were probably in part due to the new CRP plantings that initially contained lots of broadleaves and bugs for chicks. As plantings matured, they became more grass-dominated, forbs declined—bad for chicks, and hens won't nest in grass that is too tall and dense.

Where there was not CRP, only rangeland, the explanation is more complicated and harder to define but some combination of good nesting cover, good weather and forbs for chicks, intervals following burns, cutting of trees that were invading pastures which eventually means more usable space for chickens, etc. One thing I've learned after 40+ years of studying chickens and managing grasslands, I can't explain everything.

WHAT RANCHERS CAN DO (RECOMMENDATIONS)

So, what can you do to ensure prairie-chicken survival? Remember, they aren't starving to death in the winter, they just aren't successfully hatching or broods surviving.

1. Use moderate stocking. Summer and winter rotations and year-round grazing both seem to be working. Intensive rotation grazing is not. Patch-burn grazing works well further east and I think will work well here—a way to provide brood cover, nesting cover, control cedars, and improve rangeland health and diversity.
2. High-clip (ave. 14") tall grass and forbs to reduce excessive height; encourages chicken use of rangeland and CRP that is too tall. Besides reducing height of vegetation that is too tall,

removing the top portion leaves a stubble that will stand up through winter better and provide better structured nesting cover. This is especially true of brome which is preferred nest cover in Illinois. Mow in late summer or fall but not too short.

3. Occasional burning is important for cedar control and rangeland health. Longer burn intervals are better for chickens. Think about patch-burn grazing with a 4,5, or 6 year return interval for each patch.
4. Devote a portion of the land to an annual cocktail mix of plants for July-October grazing that will double for brood cover. An old cropfield would be a good place. These would be excellent brood-rearing areas in June and July for prairie-chicken, quail and pheasants, providing the critical missing link to sustain, even increase, numbers. It can still be used for grazing (grazing is safer for broods than haying), boost livestock gains when pasture quality is declining in late summer and can be a hedge against drought. A cocktail mix should be 8-12 species such as forage corn, sorghum sudangrass, millet, soybeans, cowpeas, buckwheat, sunflowers, and brassicas or collards. Remember: prairie-chickens, quail and pheasant don't starve in the winter, they starve when chicks because there aren't enough bugs that would be present because of forbs (weeds). A diverse summer forage crop can be a win-win for livestock producers and wildlife.
5. Alfalfa can be very attractive nesting and brood cover but frequent mowing destroys nests and often kills hens and chicks. Prairie-chicken, pheasant and bobwhite quail populations are often lower near alfalfa operations than elsewhere due to high mortality. However, alfalfa can be planted in small patches for brood-cover that you don't plan to hay.
6. Fallow wheat stubble used to be good for all broods but chemo-fallow and tillage changed that. If you can avoid treating wheat stubble after harvest, it would be good for chickens, quail and pheasants. You also might consider using after-harvest wheat stubble for a summer forage cocktail described above.
7. Control invasive plants especially Old World bluestems. As this insidious, invasive, unpalatable grass spreads, it will change the value of rangeland and how it will have to be managed forever. To get rid of OWB, everything has to be killed out for a year or two, then a mixture of big bluestem, indiangrass and little bluestem and forbs can be planted. Other serious invasives are bush honeysuckle, callery (Bradford) pear, and sericea lespedeza. These can be controlled with spot treatment and selective herbicides. Sericea seed lasts in the soil for years so will take repeated treatment, usually every other year.
8. Remove cedars, Osage orange (hedge), honey locust, Siberian elm, and Russian olive trees. Trees are predator habitat, hawk and owl strike points and limit nesting success (no successful prairie-chicken nests have been found within 660 feet of trees in Missouri). Occasional cottonwoods are natural in prairies and are preferred roosting for turkeys so leave a few cottonwoods (except large hollow ones which are often full of raccoons). Cottonwood buds are also used by chickens when snow or ice cover seeds on the ground for extended periods.
9. Leave a few colonies of shrubs for summer thermal protection of broods and adults.
10. If someone wants to trap raccoons, let them. They are major next predators. I don't worry much about coyotes and bobcats, though. They help control raccoons, opossums, and skunks. Redtailed hawks also help control snakes, and snakes are major egg eaters.

11.
28 10:56AM
American Red Cross

Table 1

			MALE COUNT					
LEK NAME	**County**	**Township**	**2008**	**2009**	**2010**	**2011**	**2012**	**201**
Alquist crop/Diedrick CRP	Ottawa	Henry			16	16	10	
Alquist II (Range)	Ottawa	Henry					6	N
Bachofer	Ottawa	Center	15		10	7	14	1
Cal Berkley's Hill	Ottawa	Henry			13	16	4	
C. Berkley Crop.	Ottawa	Henry			12	20	9	
Diedrick's CRP w/ Alquist	Ottawa	Henry					6	
Valerie Larson-80th Rd.	Ottawa	Center						
V. Larson/Morgenstern	Ottawa	Henry					5	
Diedrick	Ottawa	Henry	25	23	23	26	22	2
Diedrick (2 Track)	Ottawa	Center			6		8	
Kelly Zuker (Rockpile)	Ottawa	Center		16	?	16	3	
Parde (Rock Pile)	Ottawa	Center					0	
Donita Shike	Ottawa	Henry			22	20	20	1
Joan Smith	Ottawa	Henry				8	9	
Woody (E. 20th Rd.)	Ottawa	Henry					8	N
Koehn (Shafer/Midd.)	Ottawa	Henry			19	16	16	1
Koehn (Shafer II)	Ottawa	Henry					6	N
Wheat W. of Rupert	Ottawa	Bennington						
File/Berry (Church)	Ottawa	Stanton					6	1
Blaha/Fried (Ute Rd)	Ottawa	Stanton					10	
Srna/Treaty Rd.	Ottawa	Stanton					18	1
Srnajkal/L. Stirn?	Ottawa	Stanton					3	
Farrington-No. Salt Crk.	Ottawa	Fountain				12	12	
Crampton	Lincoln	Logan	12	9	9	9	6	
David Bell Pasture	Lincoln	Logan				11	11	
Mike Cole North	Lincoln	Logan			27	27	23	2
Debra Smith	Lincoln	Logan					8	1
Leon Hannebaum	Lincoln	Beaver					10	
Rose & Crangle	Lincoln	Beaver					12	
Mid-Continent	Lincoln	Beaver					12	N
Rosebrook/Post Quarry	Lincoln	Logan					11	2
Metz/Rosebrook	Lincoln	Beaver			27		16	1
Detmer	Lincoln	Elk Horn					8	N
Serrin	Lincoln	Elk Horn					7	N
Morgenstern	Lincoln						5	N

Lancaster (Shafer)	Lincoln	Logan					18	1
Mike Cole South	Lincoln	Logan				14	14	N
Meier	Lincoln	Beaver						
Dora Schroeder	Lincoln	Logan						
C. A. & D. L. Lyne	Lincoln							
M & M	Lincoln							
Total North of 18 Hwy.			**52**	**48**	**184**	**218**	**356**	**27**

Springer	Saline	Glendale	33	43	35	27	33	2
Springer Pasture	Saline	Glendale					12	
Berkley/Big 3	Saline	Glendale	12	7	13	12	7	
Burnett	Saline	Glendale	19	23	20	9	0	
Mathews	Saline	Glendale	13	16	6	6	7	
McClure Sect. 4	Saline	Glendale	15	12	15	16	15	
McClure Sect. 15, No.	Saline	Glendale			8	8	0	N
McClure Sect. 15, Middle	Saline	Glendale			12	15	15	1
McClure, Sect. 15 So.	Saline	Glendale				6	0	
Lois Muchow	Saline	Glendale	4	4	4	4	6	
Worchester	Saline	Pleasant Valley					8	N
Witte	Saline	Glendale	9	11	33	20	22	1
D.O.R. No.	Saline	Glendale	6	6			5	
D.O.R. So.	Saline	Glendale	8				12	N
JDK Farms Rd. 140	Ottawa	Bennington		19	19	19	14	1
Buffalo & 110 Rd.	Ottawa	Culver				5	6	
18 Hwy & Culver	Ottawa	Culver						
O. Larson E. Lek	Ottawa	Morton	25	22	22	26	19	
O. Larson W. Lek	Ottawa	Morton	19	23	20	9	7	N
R & L Farm	Lincoln	Colorado		13	0	5	5	1
Rathbun	Lincoln	Colorado	19	20	20	20	12	
Edalgo	Lincoln	Elk Horn			20	10	18	
Silo/Westfall Rd.	Lincoln	Madison			10	16	16	
Berkley/WIHA	Lincoln	Madison	0	0	6	19	?	
Hoeh	Lincoln	Madison			0	0	8	
So. 18 Hwy/No. of I-70			**182**	**219**	**263**	**252**	**247**	**13**

Burr	Saline	Spring Creek		0	11	0	0	N
Trace Walker	Saline	Spring Creek			20	15	22	
Bloomquist	Saline	Spring Creek					6	N
Mary Foster	Saline	Spring Creek			10			
Glen Walker	Saline	Spring Creek						
Rick Landes	Saline	Spring Creek	8	8	8	10	10	
Virgil Huseman	Ellsworth	Garfield	10				10	1
Deberg/Groth.E.Ave. E	Ellsworth	Garfield					12	2
Arrow/Groth.W.Ave.E	Ellsworth	Garfield	12				17	1
Vondra/Henry	Ellsworth	Clear Creek					5	2
W. Hwy 111 & H Rd.	Ellsworth	Ellsworth						
Nienke L & C 2	Ellsworth	Sherman						
Nienke Land & Cattle	Ellsworth	Garfield					6	N
Myles Korinek	Ellsworth	Garfield						2
Stella Riemann	Ellsworth	Ellsworth						
Gary Soukup	Ellsworth	Garfield						1
So. I-70/No. 140 Hwy.			**30**	**8**	**49**	**25**	**88**	**13**

Partick 1	McPherson	Union		32	24	10	12	1
Dogtown/McCormick	Saline	Washington			6	5	23	1
C. Hoffman-Sundgren	Saline	Falun West				10	9	
Patrick 2	Saline	Falun West				30	6	
Laforte	Saline	Falun East			20	9	14	
Miguel Contreras	Saline	Falun East						N
Ralph Johnson	Saline	Spring Creek	13	12				N
SHBR	Saline	Falun West				NC	NC	N
SHBR 71	Saline	Falun West	12	12	12	NC	NC	N
SHBR 21	Saline	Falun West	12	12	12	NC	NC	N
SHBR 81B	Saline	Falun West	12	12	12	NC	NC	N
SHBR 12	Saline	Falun West	12	12	12	NC	NC	N
Vanier 1E	Ellsworth	Empire E	9	13	13	9	8	1
Vanier 2W	Ellsworth	Carneiro				10	3	N
Schulz	Ellsworth	Empire E			22	14	12	1
Soukup	Ellsworth	Carneiro			10	10	0	
Vanek	Ellsworth	Carneiro			24	8	9	

Widgeon/Schlessiger	Ellsworth	Carneiro		20	36	20	28	4
C. Hoffman South	Ellsworth	Langley				11	?	N
C. Hoffman-North	Ellsworth	Empire E				12	?	N
Bill Hoffman Corral	Ellsworth	Empire E				12	8	N
Chs. Johnson No.	Ellsworth	Langley				12	?	N
Chs. Johnson So.	Ellsworth	Langley				4	?	
Koehn	Ellsworth	Langley					?	N
Bittenbrock	Ellsworth	Trivoli				8	?	1
Gray/Janzen	Ellsworth	Thomas					15	N
Becker	Ellsworth	Ash Creek					12	N
Colberg	Ellsworth	Ash Creek					6	N
Behnke	Ellsworth	Trivoli					5	N
Janssen	Ellsworth	Trivoli					6	N
Miller	Ellsworth	Ash Creek					9	N
B. Conner	Ellsworth	Thomas						
So. Of 140 Hwy.			**70**	**125**	**203**	**194**	**185**	**14**

Grand Totals			**334**	**400**	**699**	**689**	**876**	**68**

Number in red mean no accurate count was attained, usually due to tall vegetation or inaccessibility. Those with ? Wer not censused.

NC= Not Counted.

Table 2

QUOTAS AND TRANSLOCATED 2014

			MALE COUNT		QUOTA		TRANSLOCATED		
LEK NAME	County	Township	2012	2014	Males	Females	Males	Females	TOTALS
Alquist Crop	Ottawa	Henry	10	0	0	0			
Alquist II (Range)	Ottawa	Henry	6	?					
Bachofer	Ottawa	Center	14	15	3	2	1	0	1
Cal Berkley's Hill	Ottawa	Henry	4	2	0	0			
C. Berkley Crop.	Ottawa	Henry	9	0	0	0			
Diedrick's CRP w,alquist	Ottawa	Henry	6	0	0	0			
Valerie Larson-80th Rd.	Ottawa	Center		6	0	0			
V. Larson/Morgenstern	Ottawa	Henry	5	6	0	0			
Diedrick's Thompson	Ottawa	Henry	22	25	4	5	4	4	8
Diedrick 2-Track	Ottawa	Center	8	6	0	1		2	2
Kelly Zuker	Ottawa	Center	3	7	0	1			
Parde-RockPile	Ottawa	Center	?	?					
Donita Shikes	Ottawa	Henry	20	14	3	3	3	4	7
Joan Smith	Ottawa	Henry	9	0	0	0			
Woody	Ottawa	Henry	8	?	0	0			
Hoehn (Shafer/Middle.)	Ottawa	Henry	16	11	2	2	2	1	3
Hoehn (Shafer 2)	Ottawa	Henry	6	?	0	0			
Wheat w. of Rupert	Ottawa	Benningt on	?	8					
Farrington (Pr. & 60th)	Ottawa	Fountain	12	4	0	0			
File/Berry (Church)	Ottawa	Stanton	6	12	0	0			
Blaha/Fried (Ute Rd)	Ottawa	Stanton	10	7	0				
Srna/Treaty Rd.	Ottawa	Stanton	18	10					
Srnajkal/L. Stirn?	Ottawa	Stanton	3	5	0	0			
Crampton	Lincoln	Logan	6	6					
Bell Pasture	Lincoln	Logan	11	0					
Mike Cole North	Lincoln	Logan	23	20	0	0			
Debra Smith	Lincoln	Logan	8	11	2	2	3	2	5

Leon Hannenbaum	Lincoln	Beaver	10	7	0	1			
Rose & Crangle	Lincoln	Beaver	12	8	0	0			
MidContinent Farms	Lincoln	Beaver	12	?					
Rosebrook/Quarry	Lincoln	Logan	11	26	5	5	5	5	10
Metz/Rosebrook	Lincoln	Beaver	16	15	2	3	1	1	2
Detmer	Lincoln	Elk Horn	8	?	0	0			
Serrin or Serrien	Lincoln	Elk Horn	7	?	0	0			
Morgenstern	Lincoln		5	?	0	0			
Mike Cole South	Lincoln	Logan	14	?	0	0			
Lancaster (Shafer)	Lincoln	Logan	18	17	4	4	4	3	7
Meier	Lincoln	Beaver		9					
Dora Schroeder	Lincoln	Scott		5	0	0			
C.A. & D.L. Lyne	Lincoln			4	0	0			
M & M	Lincoln			8	0	0			
No. 18 Hwy.			**356**	**274**	**25**	**29**	**23**	**22**	**45**

Burnett	Saline	Glendale	0	5	0	0			
Hal Berkley/Big 3	Saline	Glendale	7	0	0	0			
Mathews	Saline	Glendale	7	3	0	0			
McClure Sect. 4	Saline	Glendale	15	1	0	0			
McClure Sect. 15, No.	Saline	Glendale	0	?	0	0			
McClure Sect. 15, Middle	Saline	Glendale	15	15	3	4	3	3	6
McClure, Sect. 15 So.	Saline	Glendale	0	0	0	0			
Springer	Saline	Glendale	33	23	4	2	4		4
Springer Pasture	Saline	Glendale	12	6	1	4	1	4	5
Witte	Saline	Glendale	22	18	4	3	3	1	4
Lois Muchow	Saline	Glendale	6	0	0	0			
Worchester	Saline	Pleasant Valley	8	?	0	0			
DOR North	Saline	Glendale	5	3	0	0			
DOR South	Saline	Glendale	12	?	0	0			
Berkley WIHA	Lincoln	Glendale	?	5	0				
Silo/Westfall Rd.	Lincoln	Madison	16	4	0	0			
Rathbun	Lincoln	Colorado	12	0	0	0			
R & L Farm	Lincoln	Colorado	5	12	2	2	2	2	4
Barbara Kern	Lincoln	Madison	?	?	0	0			

(Lincoln)									
Edalgo	Lincoln	Elkhorn	18	4	0	0			
Hoeh	Lincoln	Madison	8	0	0	0			
JDK Farms Rd. 140	Ottawa	Bennington	14	11	0	0			
Buffalo Rd. & 120th.	Ottawa	Culver	6	9	0	0			
18 Hwy. & Culver Rd.	Ottawa	Culver		8	0	0			
Larson, Oscar	Ottawa	Morton	26	5	0	0			
So. 18 Hwy/No. of I-70			**247**	**132**	**14**	**15**	**13**	**10**	**23**
Burr	Saline	Spring Creek N	0	?	0	0			
Trace Walker	Saline	Spring Creek N	22	0	0	0			
Bloomquist	Saline	Spring Creek N	6	?					
Glen Walker	Saline	Spring Creek N	?	?					
Mary Foster	Saline	Spring Creek N	0	0	0	0			
Rick Landis	Saline	Spring Creek N	10	0					
Virgil Huseman	Ellsworth	Garfield	10	10	0	0			
Deberg/Groth E. Ave. E	Ellsworth	Garfield	12	24	4	4	3	5	8
Arrow/Groth. W. Ave E	Ellsworth	Garfield	17	17	3	3	3	1	4
Vondra/Henry	Ellsworth	Clear Creek	5	25	0	4			
Hwy 111 & H Avel	Ellsworth	Clear Creek		9	0				
Nienke L & C 2	Ellsworth	Sherman		5	0	0			
Nienke Land & Cattle	Ellsworth	Garfield	6	?	0	0			
Myles Korinek	Ellsworth	Garfield		24					
Stella Riemann	Ellsworth	Ellsworth		9					
Gary Soukup	Ellsworth	Garfield		12					

So. I-70/No. 140 Hwy.			**88**	**135**	**7**	**11**	**6**	**6**	**12**
Patrick 1	McPherson	Union	12	12	0	0			
Dogtown/McCormick	Saline	Washington	23	10	0	0			
C. Hoffman-Sundgren	Saline	Falun West	9	6	0	0			
Patrick 2	Saline	Falun West	6	3	0	0			
Laforte	Saline	Falun East	14	0					
Maguel Contreras	Saline	Falun East							
Vanier 1E	Ellsworth	Empire	8	10	0	0			
Vanier 2W	Ellsworth	Carneiro	3	?	0	0			
Schulz	Ellsworth	Empire	12	15	0	0			
Soukup	Ellsworth	Carneiro	0	9	0	0			
Vanek	Ellsworth	Carneiro	9	5	0	0			
Widgeon/Schlisseger	Ellsworth	Carneiro	28	45	8	8	8	3	11
C. Hoffman South	Ellsworth	Langley	?	?	0	0			
C. Hoffman-North	Ellsworth	Empire W	?	?	0	0			
Bill Hoffman Corral	Ellsworth	Empire W	8	?	0	0			
Chs. Johnson No.	Ellsworth	Empire W	?	?	0	0			
Chs. Johnson So.	Ellsworth	Langley	?	9	0	0			
Chs. Koehn	Ellsworth	Langley	?	?	0	0			
Ralph Johnson	Ellsworth	Spring Creek	?	?	0	0			
Bittenbrock	Ellsworth	Trivoli	?	12	0	0			
Gray	Ellsworth	Thomas	15	?					
Becker	Ellswort	Ash Creek	12	?					

	h								
Colberg	Ellsworth	Ash Creek	6	?					
Behenke	Ellsworth	Trivoli	5	?					
Janssen	Ellsworth	Trivoli	6	?					
Miller	Ellsworth	Ash Creek	9	?					
B. Conner	Ellsworth	Thomas		8					
So. Of 140 Hwy.			**185**	**144**	**8**	**8**	**8**	**3**	**11**
Grand Totals			**876**	**685**	**54**	**63**	**50**	**41**	**91**

Mortalities 2 (Trapping, handling or transporting mortalities are included in the agency allowed quota.)

Trapped/quota attained

Steve Clubine

703 South Main

Windsor, MO 65360

660-890-1536

June 25, 2014

Mr. and Mrs. Allen Ahlquist

4221 Evergreen Road

Tescott, KS 67484

Dear Allen and Betty,

Thank you for your part in the Illinois Department of Natural Resources' effort to re-invigorate a declining prairie chicken population in Illinois with some Kansas birds. Whether we trapped birds for relocation to Illinois from your property or property you manage, I promised to get you a full report. Contained in this envelope is this short summary, and I have also included a longer report. In brief, we trapped and shipped 50 males and 41 hens from four counties - Ellsworth, Lincoln, Ottawa, and Saline. A list is enclosed. As promised, we limited removal of males to no more than 20 percent of the number counted on booming grounds (leks) in March and an equal number of hens from the same geography. More information is included in the longer report.

Before we began trapping, three Illinois DNR employees and I searched as much of the four-county area as we could to get a count of the number of male greater prairie-chickens on leks. This allowed us to determine the population and if it was stable enough (compared to previous years when Missouri Department of Conservation employees and I were trapping birds for relocation to Missouri) to sustain a 10 to 20 percent removal. Our final tally was 685 males, and we knew of or heard many more that we did not verify. Thus, I felt comfortable that removing 50 males from the area and an equal number of hens (studies have shown there is roughly as many males and females) as long as we kept within previously established protocol of removing not more than 20 percent from any one lek. For example, if a lek had 20 males in March, we could remove four males.

An important point regarding March counts versus April or later counts is that the early count will often include juveniles and non-territorial males that shift around the landscape. A lek may actually have fewer males that determine the core of the lek, say 12 or 15, in April. We normally set a trap array on the lek so that we capture more of the non-territorial males and not the core-dominant males, the latter of which determine the social order and stability of the lek.

Illinois has two grasslands for prairie-chickens—one southeast of Effingham that is around 2,300 acres and the other southwest of Effingham that is around 1300 acres. Both areas are intensively managed to provide optimum nesting conditions by high clipping (chickens won't use grass over 17 inches tall) and patch-burn grazing. Brood-cover is provided by disking small areas to encourage weeds and by patch-burn grazing native grass and forb plantings. Most of the grass used for nesting is smooth brome or timothy, both of which have been shown to be heavily and successfully used for nesting, actually supporting more birds per unit areas than grazed native prairie. All native grass is grazed because chickens rarely use ungrazed native grass.

Illinois biologists report that Kansas males that were moved to Illinois have formed at least one new lek, repopulated at least one unoccupied old lek, and mingled with displaying Illinois males. A relocated Kansas hen was observed mating with an Illinois male, and a Kansas hen was observed mating with an Illinois male. So genetic mixing is well on its way, pending successful nesting and rearing of young.

Some of you asked how you could help ensure the birds do well on your property. I feel I have knowledge that may help. I have been a grassland wildlife biologist for over 40 years, hunted pheasants and quail in the Salina area for 49 years, and returned to this area six out of the last seven years to catch prairie-chickens for translocation to Missouri or Illinois. These years allowed me to get a reasonable understanding of some factors contributing to and limiting prairie-chicken abundance, but I am always learning more.

The factors that determine prairie-chicken densities are always nesting and brood cover. Winter survival and grain in fields have little to do with prairie-chicken survival. They are tough and resourceful birds in fall and winter, but are vulnerable to poor nest and brood cover, cool damp weather at peak of hatch (last week of May and first week of June), predation, and fence and high-wire collisions.

Hens nest in moderately dense grass between 6 and 17 inches tall and rear chicks in pastures and fields that have significant broadleaf forb densities and easy mobility for chicks. CRP fields rarely meet conditions for nesting or brood-rearing except in the first few years after being planted. These fields soon become too tall and dense, and forbs that support bugs for chicks get chocked out by dense grass. Recent telemetry studies on lesser chickens have shown that hens may use the outer 50 feet of CRP for nesting if it is adjacent to pastures or weedy fields for brood-rearing. I feel the same is true for greater prairie-chickens in the Smoky Hills region.

We truly appreciate your help and access to your property. We hope to return to this area as long as prairie-chicken populations remain stable and Kansas Wildlife and Parks approves. I look forward to working with you for years to come.

Sincerely,

Steve Clubine

Retired Grassland Biologist