January 30, 2017

Public Comments Processing, Attn: FWS-HQ-ES-2016-0133
U.S. Fish and Wildlife Service
MS: BPHC
5275 Leesburg Pike
Falls Church, VA 22041-3803

RE: Comments on the U.S. Fish and Wildlife Service 90-Day Finding and Initiation of Status Review for the Lesser Prairie-Chicken under the Endangered Species Act (FWS-HQ-ES-2016-0133); 81 *Fed. Reg.* 86,315 (Nov. 30, 2016)

Dear Sir or Madam:

The National Rural Electric Cooperative Association (NRECA) submits these comments in response to the U.S. Fish and Wildlife Service (FWS or the Service) notice of a 90-day finding on a petition to list the Lesser Prairie-Chicken (LPC) under the Endangered Species Act (ESA) and initiation of a status review. 81 *Fed. Reg.* 86,315 (Nov. 30, 2016). The LPC does not warrant listing as a matter of law, fact, science or policy. The best scientific and commercial information available demonstrates that the LPC's population is stable, and that significant public and private conservation measures are underway that will protect the continued stability of the LPC and expand its habitat and range.

For the reasons set forth below, FWS should issue a 12-month finding on the petition that listing of LPCs is not warranted.

I. Summary of Comments

The best available scientific and commercial data demonstrate that LPC populations are stable, if not increasing and its habitat and range are expanding. The most recent surveys help estimate long-term populations trends, but are just that. The surveys are not a precise population count. Regardless, properly understood, the surveys demonstrate decades of stability.

The asserted threats to the LPC are exaggerated, remote, and misplaced. The definitions of "endangered" and "threatened" set a high bar for listing. A species may only be listed where the best available science demonstrates that it is in or near danger of going extinct – endangered with becoming extinct, or threatened with becoming so endangered. The LPC is far from that point. There is no valid basis to conclude that it would reach that point in the reasonably foreseeable future.

Finally, extensive and important voluntary conservations measures are being implemented by public and private stakeholders that avoid any need for a listing. There has been and continues to be substantial investment by a wide-range of industry and local governments across multiple States. Over 10,098,471 acres in total (more than half of which is privately owned land) are

currently under protections for the benefit of the LPC. This huge swath of land grows each year and the resources available to organizations, such as the Western Association of Fish and Wildlife Agencies (WAFWA), to protect the LPC's habitat and range also grow. These efforts by the States, local governments, and affected stakeholders should not be discouraged or overwritten by the Service through a listing of a species that is well protected and stable.

II. NRECA

NRECA is the national service organization dedicated to representing the national interests of cooperative electric utilities and the consumers they serve. NRECA represents over 900 private consumer-owned rural electric cooperatives and public power districts, who collectively provide electric service to an estimated 42 million people in 47 states or nearly 13 percent of the nation's electric customers. They serve more than 19 million businesses, homes, schools, churches, hospitals, farms, irrigation systems and other establishments. NRECA serves its members as an advocate for legislative and regulatory policies that are scientifically sound, cost-effective, and balance consumer interests and environmental protection.

Electric cooperatives are an integral part of the U.S. electric utility industry, and play a critical role in our nation's economy and in local communities. NRECA members deliver safe, reliable, and affordable electric service to vast rural areas of the United States. The safe and reliable supply of energy at an affordable cost requires the construction, maintenance and repair of millions of miles of electrical transmission and distribution lines. Electric cooperatives own and maintain 2.6 million miles, or 42 percent, of the nation's electric distribution lines, covering three quarters of the nation's landmass. NRECA's members also include 65 generation and transmission (G&T) cooperatives, which generate and transmit power to 668 of the 836 distribution cooperatives. Remaining distribution cooperatives receive power directly from other generation sources within the electric utility sector.

Electric cooperatives have legal public service obligations to provide reliable electric service to their customers, and are incorporated as private, independent entities in the states in which they reside. They were established to provide at-cost electric service to their member-consumers. The typical distribution cooperative is a small business entity, according to the Small Business Administration, that serves 13,000 member-consumers. U.S. Energy Information Administration (EIA) data show that rural electric cooperatives serve an average of 7.4 consumers per mile of line and collect annual revenues of approximately $15,000 per mile of line. In contrast, investor-owned utilities (IOUs) serve an average of 34 customers per mile of line and collect annual revenues of approximately $75,500 per mile of line. Significantly due to this revenue-per-mile disparity between cooperatives and investor-owned utilities, 67 percent of rural electric cooperative members have residential electric rates that are higher than their nearest investor-owned utility. These higher rates are an impediment to the economic recovery and viability of rural communities, many of which continue to struggle after years of economic downturn. In addition to providing high-quality, affordable electric service, electric cooperatives are deeply committed to their communities.

The operations of certain NRECA members occur within the range of the LPC. The LPC is a grassland bird primarily found in southeastern Colorado, western Kansas, eastern New Mexico, western Oklahoma, and the Texas Panhandle. Suitable habitat for LPC includes grasslands in

Kansas, sand sage prairie habitat in Colorado, Kansas, Oklahoma, and Texas, and shinnery oak habitat in New Mexico, Oklahoma, and Texas, 79 *Fed. Reg.* at 20,006. NRECA's members provide electric service to rural areas of Kansas, Colorado, Oklahoma, New Mexico and Texas, and are subject to legal public service obligations to provide reliable electric services to customers within those areas. They construct, own, operate, and maintain generation facilities, transmission and distribution lines, substations, and other facilities that provide electric energy for residential, commercial, industrial, institutional, and governmental customers.

NRECA members are actively involved in conservation efforts designed to increase LPC populations and improve or expand LPC habitat, including the development of the State-led Lesser Prairie Chicken Range-wide Conservation Plan. NRECA firmly believes that the implementation of voluntary, cooperative, multi-stakeholder conservation programs, such as the Range-wide plan, are the most comprehensive and effective way to improve the status of the LPC.

As described further below, any listing under the ESA could have significant ramifications for NRECA's members and the communities they serve. Many NRECA members have existing loans through the U.S. Department of Agriculture's Rural Development program – the Rural Utilities Service (RUS). In addition, NRECA members may frequently apply for additional financial assistance offered by RUS. Any listing of the LPC would add additional requirements to their required National Environmental Policy Act (NEPA) analyses and ESA compliance, necessitating additional expenses and delays in activities undertaken to provide affordable and reliable service to consumers. NRECA members could also be challenged with additional costs and delays associated with obtaining incidental "take" permits should the LPC be listed. Accordingly, NRECA has a long history of participation in the FWS's review of the LPC, and has submitted multiple sets of comments and intervened on behalf of the Service in defense of the prior special 4(d) Rule. FWS's status review of the LPC is of critical importance to NRECA and its members, their operations, and their public service obligations.

III. Background

A. Statutory and Regulatory Background

The ESA sets a high standard for listing a species as threatened or endangered. A species is "threatened" when it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20). An "endangered species" is "a species which is in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6). The ESA does not define the term "foreseeable future," but FWS has interpreted it to mean "the horizon over which predictions about the conservation status of the species can be reasonably relied upon." 80 *Fed. Reg.* at 15,276.

To determine whether a species warrants listing as threatened, the ESA requires FWS to consider five factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural manmade factors affecting its continued existence. 16 U.S.C. § 1533(a)(1). The Service's decision must be based "solely on the basis of the best scientific and commercial data . . . and

after taking into account those efforts, if any, being made by any state or foreign nation or political subdivision of a state or foreign nation to protect such species . . . ." *Id.* § 1533(b).

Critical to the Service's review here is the fourth listing factor – the sufficiency of existing regulatory mechanisms to protect the species. There are substantial Federal, State, and local conservations measures in place to protect the LPC and its habitat that have already proven to be successful. In addition, where there are conservation efforts underway that may not be fully implemented by the time of the listing decision, the Service should consider such measures under the 2003 Joint Policy for the Evaluation of Conservation Efforts When Making Listing Decisions (PECE Policy), which "identifies criteria [the Service] will use in determining whether formalized conservation efforts that have yet to be implemented or to show effectiveness contribute to making listing a species as threatened or endangered unnecessary." 68 *Fed. Reg.* 15,100 (Mar. 28, 2003). The PECE Policy sets forth two criteria to guide the Service's evaluation whether new conservation measures may be considered in a listing decision: (1) the certainty that the conservation measure will be implemented; and (2) the certainty that the conservation measure will be effective. *Id.*

Several criteria are relevant to each prong of the PECE analysis to determine whether a specific conservation effort can be considered in the context of a listing decision. For example, the Service must evaluate the conservation effort, the parties to the agreement that will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified. The Service must also review the legal authority of the parties to the agreement to implement the formalized conservation effort, the parties' commitment to proceed with the conservation effort, the type and level of voluntary participation necessary to implement the conservation effort, and a high level of certainty is provided that the parties to the agreement will obtain that level of voluntary participation. *Id.* at 15,114.

B. NRECA and its Members Have Been Actively Involved in the Service's Review of the LPC, and Participated in the Early Conservation Measures Designed to Protect the Species.

The LPC was first classified as a candidate for listing in 1998. Desiring to take early action to conserve the species and avoid the added costs and burdens of a listing under the ESA, however, federal, state, and private entities began working together to protect LPC habitat. Despite these efforts, under pressure from environmental groups, FWS proposed to list the LPC as a threatened species in late 2012. 77 *Fed. Reg.* 73,828 (Dec. 11, 2012). The Service also sought comment on which prohibitions, and any exceptions, necessary and advisable to provide for conservation of the LPC under section 4(d) of the ESA. *Id.*

Due to the significant impacts of any listing on NRECA's members, NRECA submitted two sets of comments on behalf of its members on the Service's proposed rule, worked with the Avian Power Line Interaction Committee (APLIC) to submit an additional set of comments, and held several meetings with Service Director Dan Ashe and his staff.[1] NRECA members, such as the

[1] NRECA Comments on Listing of the Lesser Prairie-Chicken as a Threatened Species With a Special Rule, Docket No. FWS-R2-ES-2012-0071-0431 (June 20, 2013); NRECA Comments on Listing the Lesser Prairie-Chicken as a Threatened Species With a Special Rule,

Western Farmers Electric Cooperative (WFEC)[2] and Sunflower Electric Power Corporation (Sunflower Electric)[3], also submitted comments on the proposals and attended FWS-held public hearings. NRECA noted the heavy burdens that such a determination would have on electric cooperatives.[4] ESA compliance can impact the ability of cooperatives to site and maintain power lines essential to the reliable, safe, and affordable supply of energy to U.S. consumers. NRECA described the voluntary conservation efforts underway that were adding protection for the LPC and its habitat, and its substantial concerns with outdated and poorly supported analyses of potential impacts of power line structures on the LPC. NRECA urged the Service to find that a listing of the LPC as threatened was not warranted.

Indeed, as the Service recognized in its December 2012 proposal:

> Numerous conservation actions have been implemented within the historical range of the lesser prairie-chicken, many focused primarily on the currently occupied portion of the range, during the last 10 to 15 years. The State conservation agencies have taken a lead role in implementation of these actions, but several Federal agencies and private conservation organizations have played an important supporting role in many of these efforts. Recently, several multi-State efforts have been initiated….

77 *Fed. Reg.* at 73,830. A brief summary of certain of the conservation efforts that existed at the time of the 2012 proposal follows:

- On the federal level, the U.S. Department of Agriculture's (USDA) Farm Services Agency (FSA) implemented the Conservation Reserve Program (CRP), which is targeted at agricultural landowners and has provided short-term protection and enhancement of millions of acres within LPC range. The CRP is a voluntary program that allows eligible landowners to receive annual rental payments and cost-share assistance to remove land from agricultural production and establish vegetative cover for the term of the contract. All five States within LPC range have lands enrolled in CRP.

- In 2010, the USDA Natural Resources Conservation Service (NRCS) began the Lesser Prairie Chicken Initiative (LPC Initiative) to provide technical and financial assistance to

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Docket No. FWS-R2-ES-2012-0071-0558 (Jan. 10, 2014); APLIC Comments on the Proposed Listing of the Lesser Prairie-Chicken as a Threatened Species, FWS-R2-ES-2012-0071-0294 (Mar. 11, 2013).

[2] WFEC Comments on Proposed Listing of the Lesser Prairie-Chicken as a Threatened Species, FWS-R2-ES-2012-0071-0143 (Mar. 6, 2013); WFEC Comments on Proposed Range-wide Conservation Plan for the Lesser Prairie Chicken, FWS-R2-ES-2012-0071-0394 (June 19, 2013).

[3] Sunflower Electric Comments on Proposed Listing of the Lesser Prairie-Chicken as a Threatened Species, FWS-R2-ES-2012-0071-0143 (Mar. 6, 2013).

[4] Press Release, NRECA, NRECA Critical of Lesser Prairie Chicken Ruling, (Apr. 1, 2014), http://www.nreca.coop/lesser-prairie-chicken/ (accessed Sept. 29, 2014).

farmers to voluntarily protect and enhance LPC habitat. Numerous partners are involved in this multi-state initiative including the State conservation agencies, the Playa Lakes Joint Venture, and the Wood Foundation. NRCS committed approximately $17.5 million to the LPC Initiative in Texas alone. In 2010, the identified funds were allocated throughout the historical range, with approximately 33,956 ha (83,907 ac) placed under contract within those counties that intersected the estimated occupied range. Another 32,139 ha (79,417 ac) were allocated to contracts on lands outside of the estimated occupied range but within unoccupied portions of the historical range. In 2011, efforts were undertaken to more precisely apply the funds to areas within the estimated occupied range. *Id.* at 73,831.

- At the state level, the State Acres For Wildlife Enhancement program (SAFE) is a conservation practice that targets grassland habitat improvement measures within the range of the LPC. By 2014, SAFE improved over 214,000 acres of LPC habitat. Each of the five states in LPC range participated in research, funding, and conservation efforts.

- A number of Candidate Conservation Agreements (CCAs)[5] and Candidate Conservation Agreements with Assurances (CCAAs)[6] exist to benefit the LPC. The LPC is covered by a CCA with the Bureau of Land Management (BLM) and two "umbrella" CCAAs, one in Texas and New Mexico. Under these agreements, the participants agree to implement certain conservation measures that are anticipated to reduce threats to LPC and improve their population stability, through increases in adult and juvenile survivorship, nest success, recruitment rates, and reduced mortality. *Id.* at 73,832.

- Of particular note, the New Mexico Conservation Plan provided conservation benefits to both the LPC and the dunes sagebrush lizard (DSL), a species that shares LPC habitat and habitat needs. Pursuant to this program, private landowners enrolled 1,740,000 acres in New Mexico's ranching Conservation Plan, and an additional 875,000 acres in the oil and gas Conservation Plan. New Mexico enrolled 248,000 acres of LPC habitat in the Conservation Plan, and BLM, acting in conjunction with New Mexico, closed future oil

[5] CCAs are voluntary conservation agreements between the Service and one or more public or private parties. The Service works with its partners to identify threats to candidate species, plan the measures needed to address the threats and conserve these species, identify willing landowners, develop agreements, and design and implement conservation measures and monitor their effectiveness. *See* https://www.fws.gov/endangered/what-we-do/cca.html.

[6] CCAAs expand on the success of traditional CCAs by providing non-federal landowners with additional incentives for engaging in voluntary proactive conservation through assurances that limit future conservation obligations. One of the primary reasons for developing the CCAA program was to address landowner concerns about the potential regulatory implications of having a listed species on their land. The CCAA program specifically targets non-federal landowners and provides them with the assurance that if they implement various conservation activities, they will not be subject to additional restrictions if the species becomes listed under the ESA. These assurances are only available to non-federal entities for actions on non-federal lands. *See* https://www.fws.gov/endangered/what-we-do/cca.html.

and gas leasing on 153,257 acres in New Mexican LPC/DSL habitat and ensured that 132,590 acres of unleased federal land in New Mexican LPC/DSL habitat would remain unleased.

The Service recognized these conservation efforts in the proposed rule, and reasoned that "these actions … have, at least in some instances, slowed, but not halted, alteration of lesser prairie-chicken habitat." 77 *Fed. Reg.* at 73,836. FWS believed that "continued implementation of these and similar future actions is crucial to lesser prairie-chicken conservation" but, at the time, thought there were insufficient "measures … to fully address the known threats, including the primary threat of habitat fragmentation, in a manner that effectively reduces or eliminates the threats," *id.,* because the LPC conservation efforts were limited in size and duration. FWS concluded that because the measures are voluntary, there was insufficient certainty that the measures would be implemented. *Id.* Years later, and as described further below, the best available data clearly prove that the extensive and numerous voluntary range-wide conservation measures have benefited the species' population over time, and its habitat and range, and thus no listing is warranted.

C. 2014 Listing Decision, Section 4(d) Special Rule, and Range-wide Plan.

Despite the extensive conservation measures that were in place, in 2014, FWS listed the LPC as a threatened species under the ESA, 79 *Fed. Reg.* 19,974 (Apr. 10, 2014), and issued an ESA section 4(d) special rule. 79 *Fed. Reg.* 20,074 (Apr. 10, 2014).[7]

Among the conservation agreements recognized in the 4(d) special rule was the WAFWA plan. This plan was developed in conjunction with five state wildlife agencies and numerous stakeholders, including NRECA and its member electric cooperatives in Colorado, Kansas, New Mexico, Oklahoma, and Texas. WAFWA's LPC Range-wide Conservation Plan (Range-wide plan) identified specific population goals for the LPC, and metrics for monitoring those populations; identified focus areas in each state; listed actions that would be taken to help increase the population; and provided a system for mitigating impacts.

The Range-wide plan requires participating companies to pay fees into a conservation fund in exchange for the ability to operate within LPC habitat without violating the take prohibition. For example, for just one 6.5-mile transmission project in LPC habitat to obtain incidental take authorization under the 4(d) special rule, one WFEC member paid over half a million dollars in mitigation fees under the Range-wide plan. For a small rural electric cooperative and its rural customers, these costs are considerable. NRECA members continue to participate in the Range-

[7] Section 4(d) of the ESA authorizes the Service to issue regulations "necessary and advisable to provide for the conservation of" threatened and endangered species, including any act prohibited under section 9 of the ESA (known as the "take" prohibition). 16 U.S.C. § 1533(d). The Service has developed general prohibitions, 50 C.F.R. § 17.31, and exceptions to those prohibitions, 50 C.F.R. § 17.32, under the Act that apply to most threatened species. The Service may adopt a "special" section 4(d) rule that incorporates the general prohibitions and authorizations set forth in 50 C.F.R. § 17.31 and § 17.32, and provisions that are tailored to the specific conservation needs of the threatened species, as it did for the LPC.

wide plan as well as performing other LPC impact avoidance and minimization measures despite vacatur of the listing decision and special 4(d) rule.

D. The Listing Decision Was Vacated for Failure to Adequately Consider Existing Regulatory Mechanisms Benefitting the Species.

Multiple lawsuits were filed challenging the FWS's decision to list the LPC as threatened and the special 4(d) rule. Although NRECA did not believe that the threatened listing was warranted, it moved to intervene in support of the FWS in a lawsuit brought by Defenders of Wildlife challenging the decision to list the LPC as threatened, rather than endangered, and challenging the special 4(d) rule. NRECA intervened to defend against the positions advanced by Defenders of Wildlife.[8]

On September 1, 2015, the Western District of Texas issued a decision finding that FWS failed to follow its own policies for evaluating conservation efforts when making listing decisions. *Permian Basin Petroleum Ass'n. v. Dep't of the Interior*, 127 F. Supp. 3d 700 (W.D. Texas 2015). The court focused on FWS's PECE Policy for considering conservation efforts when making listing decisions, which requires FWS to evaluate all formal conservation efforts that have not been fully implemented by considering how likely the effort is to be implemented, and the potential effect of the effort on the species' status. The court found that FWS's analysis of the Range-wide plan was neither rigorous nor valid, and that these failures were material to FWS's decision to list the LPC. The Western District of Texas further held that FWS improperly held the Range-wide plan to a standard that required demonstration that the plan would eliminate or reduce threats to the species at the time of the listing – rather than eliminate or reduce those threats in the future, as required by the PECE Policy. The Policy provides a framework for assessing the future value of voluntary conservation efforts that have not yet been fully implemented or demonstrated to be effective. Accordingly, the court held unlawful and set aside the threatened listing. On July 27, 2016, FWS issued a direct final rule removing the LPC from the threatened list to comply with the court's order.

E. Petition and 90-Day Finding

On September 8, 2016, three environmental groups filed a petition requesting that: (1) the LPC be listed as endangered throughout its range; (2) three distinct population segments (DPS) of the LPC be listed; (3) two DPS be emergency listed as endangered; and (4) critical habitat be concurrently designated for the LPC. Petition to List the LPC (Sept. 8, 2016) (Petition).

On November 30, 2016, FWS announced its 90-day finding on the Petition. The Service's finding determined that there was substantial scientific or commercial information available indicating that listing the LPC may be warranted based on three factors: (1) the present or threatened destruction, modification or curtailment of LPC habitat or range; (2) the inadequacy of existing regulatory measures; and (3) other natural or manmade factors. 16 U.S.C. § 1533(a)(1).

[8] This case was eventually dismissed after the U.S. District Court for the Western District of Texas vacated the listing decision.

The Service is now initiating a status review to determine if the species should be listed. 81 *Fed. Reg.* at 86,315. Pursuant to the ESA, the FWS will evaluate all potential threats to the LPC, including the extent to which any protections or other conservation efforts have reduced those threats. *Id.* Based on the status review, the Service will issue a 12-month finding evaluating the "best scientific and commercial data available" to determine whether listing of the LPC "is warranted." *Id.* Even though the 90-day finding was found to present substantial information indicating that the petitioned action may be warranted, the standard for a 90-day finding is lower than the standard that applies to a status review. Thus, the Service must ensure that the 12 month status review applies the appropriate standard. The Service may not simply conclude, based on the 90-day finding, that a listing of the LPC as endangered or threatened is warranted.

The Service has requested scientific and commercial data, and other information, regarding the LPC by January 30, 2017, including "past and ongoing conservation measures that could decrease the extent to which one or more of the [listing] factors affect the species, its habitat, or both." *Id.* If listing is found warranted, the Service will propose critical habitat "to the maximum extent prudent and determinable." Therefore, the Service also requests data and information pertaining to designation of critical habitat for the LPC.[9]

On December 13, 2016, NRECA submitted a request for a 60-day extension of the comment period. In support of this request, NRECA stated that additional time was needed to review and provide substantive comments in response to the notice. NRECA noted that the Service has 12 months to complete its status review, and thus an extension of the comment period would not delay FWS's review.

On December 20, 2016, NRECA submitted a follow up letter requesting a 90-day extension of the comment period in light of important new information that will soon be available. NRECA's revised request noted that the 2016 LPC Range-wide plan Annual Progress Report is expected to be final and available to the public in late-March 2017. The 2016 annual report will track progress towards LPC conservation goals and detail activities related to Range-wide plan implementation from January 1 through December 31, 2016, including the number of industry participants, acres placed in perpetual conservation easements, and habitat restoration efforts. Recognizing that the 2016 WAFWA annual report will include key information on past and ongoing conservation measures that are relevant to the key consideration of the adequacy of existing regulatory mechanisms, NRECA urged the FWS to consider the report and public comment on the report before determining the need to list the species. Thus, to allow NRECA and its members adequate time to review and include feedback on the annual report within the overall comment package, NRECA requested a 90-day extension.

[9] The ESA requires that the FWS designate critical habitat "concurrently" with making a listing decision "to the maximum extent prudent and determinable." 16 U.S.C. § 1533(a)(3)(A). NRECA believes it would be premature for the FWS to consider comments pertaining to the designation of critical habitat at this time. FWS should defer any consideration of what critical habitat to a later time, if and only if, it determines that listing is warranted and moves forward with a proposed rule to list the species as threatened (or, endangered, even though that would be well beyond the protections necessary for the LPC given the stability of its population and range).

Despite the fact that the Service invited public comment, and could have provided an extension of that comment period and still have plenty of time to complete its 12-month status review, by letter dated January 13, 2017, the Service denied NRECA's request (and those submitted by other members of the public). The Service stated that the 90-day finding is not a proposed rule, and thus did not trigger "a formal comment period." Accordingly, the Service stated that it would accept relevant information after January 30, 2017 and a formal extension was not needed. At the same time, the FWS pointed out that it is currently conducting a biological analysis, known as a "species status assessment" (SSA) to "help inform the 12-month finding." To meet a 12-month finding deadline of September, 2017, the Service decided that information included in the SSA will need to be completed by April 1, 2017. Thus, in order to have information related to the LPC included in the SSA, the Service states it would need to receive it "earlier in the year" than April 1. Once the FWS analyzes that information, it will write a SSA Report that will undergo peer review before the 12-month finding is completed. In sum, the Service appears to be imposing deadlines on itself and the public that will preclude a carefully considered and fully informed review of the status of the LPC despite pending information on the LPC and key conservation initiatives.[10]

NRECA strongly urges the Service to allow the public to review and comment on the draft SSA Report while it undergoes peer review. Since this Report will serve as the basis for the 12-month finding, it is critical that members of the public, including regulated parties, have the opportunity to review and provide feedback on the draft. As such, the Service should publish the Report in the *Federal Register* once it is available.

IV. Listing of the LPC is Not Warranted.

There is no basis under the five listing factors to justify listing the LPC as either threatened or endangered. As described further herein, the existing regulatory and conservation measures are adequate to protect the species. Furthermore, the best available scientific data demonstrates that

[10] In fact, the Service need not issue a 12-month finding for the LPC by September, 2017. The Service's July 27, 2016 "Methodology for Prioritizing Status Review and Accompanying 12-Month Findings on Petitions for Listing" sets forth a prioritization methodology for addressing species' status reviews and accompanying 12-month findings after completed 90-day findings indicate that the species may warrant listing. 81 *Fed. Reg.* 49,251. This methodology recognizes that the 12-month statutory deadline has proven not to be achievable given the workload in the listing program and available resources. The methodology provides FWS with discretion to prioritize critically impaired species, while giving lower priority to those species for which conservation efforts are underway. The LPC belongs in bin four ("conservation opportunities in development or underway") due to the existing conservation agreement and commitments, which are in place and effective. In light of these measures, the Service should place the LPC in bin 4 in an updated version of the National Listing Workplan, which will allow the Service additional, needed time to complete the status review and consider new data on the species.

population levels are stable, if not increasing, and occupied range is expanding.[11] Indeed, the LPC is a superb example of the benefits that can be accomplished for species when stakeholders are afforded the opportunity and incentive to engage in voluntary, cooperative initiatives to conserve species and their habitats. The Service has appropriately emphasized the importance of "collaboration among states, landowners and federal agencies" in species conservation, and in advancing "the likelihood of conservation gains across the nation while reducing burdens and promoting certainty."[12] Rather than create a disincentive to the ongoing and future proactive, collaborative efforts by imposing the costs and burdens of a listing despite these efforts, the Service should allow the range of voluntary stakeholder initiatives a chance to demonstrate their value. Further, it is important to note that no species conservation plan, state, private or federal, of similar scope and size to the Range-wide plan would be expected to achieve all of its species goals on day one; therefore, this and the other conservation efforts must be given appropriate time to demonstrate results.

A. The Best Available Scientific and Commercial Information Demonstrates a Stable Population.

The best available scientific and commercial data should include the species' biology, range, and population trends, including habitat requirements, genetics, historical and current range. Petitioners' suggest that LPCs are at risk of extinction because their present abundance "represents less than 1% of the original total." But this is simply not the case. The range of LPC population variability appears to have remained relatively constant over the past five decades, particularly when accounting for the difficulty in making precise, reliable population estimates.

Historically, LPC populations have been monitored by ground-based lek surveys and counts of birds attending leks. Such methods are labor intensive, limited by access, often restricted to roads, and may be a poor index of abundance. The first known LPC surveys, which occurred in the 1940s, were geographically limited. For decades, biologists at state game agencies conducted annual spring counts of male LPC when they congregate at leks to attract females and mate with them.

Range-wide estimates did not occur until the 1960s when the total range-wide population was estimated to be between 36,000 and 43,000 individuals. 77 *Fed. Reg.* at 73,846. In 1980, the fall LPC population (which tends to be higher than the spring population) was estimated to be between 44,400 and 52,900 individuals. *Id.* In 2003, the estimated range-wide population was 32,000 individuals. *Id.*

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[11] *See* http://www.wafwa.org/news/e_1945/News/2016/7/Aerial_Surveys_Document_Stable_Lesser_Prairie-Chicken_Population_Trends.htm.

[12] *See* U.S. Department of the Interior Press Release, *U.S. Fish and Wildlife Service, NOAA Propose Actions to Build on Successes of Endangered Species Act -- Initiatives will increase regulatory predictability, increase stakeholder engagement, and improve science and transparency* (May 18, 2015).

1. WAFWA Range-wide LPC Surveys Support the Continued Stability of the Species.

In 2012, WAFWA began annual range-wide surveys. 77 *Fed. Reg.* at 73,846. The survey results from the annual WAFWA range-wide LPC surveys show population results that are close to or within the range of the population estimates from the mid-1960s. *Id.* The survey relies on aerial results as verified by ground surveys. The survey's parameters include: a minimum of five LPCs per lek must have been observed for the lek to be considered an "active lek" and reported in the survey results; the model used the fewest number of variables; and reported results have a 90% confidence interval.

These aerial survey methods, however, also have limitations, and thus are population estimates, not precise counts of the entire species. Multiple environmental and human factors impact the accuracy of aerial surveys including: (a) variation in survey logistics (*e.g.*, time limitations due to weather, scheduling constraints affecting area covered); (b) variables that influence lek detection, including aircraft type, distance to the lek, and lek type (man-made or natural lek); (c) range and variable habitat of LPCs; (d) variable lighting conditions affecting visibility conditions; (e) smoke or haze; (f) observer fatigue; and (g) inclement weather, including rain, fog, or high winds.

Moreover, lek detectability varies between man-made leks and natural leks. Man-made leks are more detectable, perhaps in part due to the capability of targeting potential man-made lek sites on the landscape. Windmills, abandoned oil pads, and livestock watering tanks were all used as lek sites by LPCs and the absence of vegetation at these sites made LPCs easily detectable.

Understanding the inherent difficulties and factors that influence aerial surveys provides context for interpreting the aerial surveys. The aerial surveys demonstrate a stable population, but fluctuations in population numbers in any given year are to be expected and are not indicative of a population drop, much less proof of any need for further protections under the ESA. Indeed, WAFWA biologists have noted that LPC numbers regularly fluctuate "up and down from year to year due to changes in habitat conditions mainly influenced by rainfall patterns." Report at 13. As WAFWA notes:

> The monitoring technique used for [the LPC] survey is designed to track trends, and both the three and five-year trends still indicate a stable population. Lesser prairie-chickens inhabit a large geographic landscape with highly variable weather patterns, so we expect to see annual and regional population fluctuations. What these numbers show is the importance of maintaining good prairie habitat for long-term population stability. Populations have responded positively in recent years to increased and timely rainfall in portions of the bird's range most affected by the 2011-2012 drought. Specifically, the population has significantly increased over the last three years in the sand sagebrush ecoregion. Voluntary conservation efforts like the range-wide plan help to ensure that suitable habitat is

[13] *See* http://www.wafwa.org/news/e_1945/News/2016/7/Aerial_Surveys_Document_Stable_Lesser_Prairie-Chicken_Population_Trends.htm.

> available so these population increases can occur when weather conditions are suitable.[14]

With that context in mind, the WAFWA survey results for 2012-2016 are as follows:

Region	**2012**	**2013**	**2014**	**2015**	**2016**
Shinnery Oak Prairie	4,108	2,167	1,474	896	3,255
Sand Sage Prairie	2,680	2,173	513	897	1,479
Mixed Grass Prairie	10,318	4,350	7,686	10,027	6,891
Shortgrass/CRP Mosaic	21,561	11,606	14,289	18,165	14,025
Total	38,667	20,297	23,962	29,985	25,651

McDonald *et al.*, Range-Wide Population Size of the Lesser Prairie Chicken: 2012, 2013, 2014, 2015, and 2016 (July 21, 2016), Table 8 at 13.[15]

These population numbers and trends reflect the stability of the population over the last fifty years. Although drought and water-availability issues are not uncommon and can decrease LPC abundance, LPC's high rate of reproduction and large clutch sizes have allowed populations to rebound and even expand. The 2016 surveys indicated apparent population increases in the shinnery oak ecoregion of eastern New Mexico and the Texas Panhandle and the sand sagebrush ecoregion of southeast Colorado and southwest Kansas. *Id.* The LPC populations in these regions experienced the most decline as a result of the 2011-2012 drought. *Id*. Population decreases were observed in the mixed-grass prairie ecoregion of the northeast Panhandle of Texas, northwest Oklahoma and south-central Kansas, and the short-grass prairie region of northwest Kansas. *Id*.

Importantly, WAFWA concludes:

> The latest lesser prairie-chicken survey shows bird population trends remain stable after five years of aerial survey data collection. The surveys indicated an estimated breeding population of 25,261 birds [in 2016] which scientists say is not significantly different from the 29,162 birds estimated in 2015 given the variability in the survey methodology. [The 2016] spring's breeding population remains significantly larger than the 17,616 birds that were estimated in 2013 following two years of severe drought.

WAFWA properly acknowledges that "[j]ust as with [2015's] population increase, we shouldn't read too much into short-term fluctuations over one or two years." *Id.* Indeed, there were roughly as many birds in 2016 as 2015, perhaps even more. The 2016 estimate of 25,651 was

[14] *Id.*

[15] *See* http://www.wafwa.org/Documents%20and%20Settings/37/Site%20Documents/LPC/Final%20LPCH%20Range%20Wide%2021%20July%202016.pdf

used for purposes of the population trend analysis because it covered the same cells surveyed from 2012-2015. The 2016 survey, however, was increased to include new survey areas. Based on that larger survey area, the total population estimate is actually 27,926. Importantly, a large part of the increased abundance identified by expanding the survey area was in the shinnery oak ecoregion.

B. There Are No Meaningfully "Distinct" Population Segments of the Overall LPC Population

The Petition requests that FWS designate three distinct population segments (DPS): (1) a Shinnery Oak Prairie DPS; (2) a Sand Sagebrush Prairie DPS; and, (3) a Mixed-Grass and Shortgrass Prairie/CRP Mosaic DPS. Petition at 2. Petitioners' requested each of these DPS be listed as endangered and on an emergency basis, which the FWS properly rejected.

The ESA applies to distinct taxonomic species, "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife that interbreeds when mature." 16 U.S.C. § 1532(16). In 1996, NMFS and FWS adopted a DPS policy defining the two required criteria that must be met in order for a population segment to be considered a DPS. 61 *Fed. Reg.* 4722 (Feb. 7, 1996). First, the segment must be discrete – meaning there is conspicuous separation from the remainder of the species. And, second, the segment must be significant in some unique biological manner, or provide some significant role in the species as a whole. FWS specifically acknowledged that it was directed by Congress to "use its authority with respect to designating DPSs 'sparingly' and only in instances 'when the biological evidence indicates that such action is warranted.'"

Petitioners' argue that the three LPC population segments are markedly discrete based on the geographic separation of the species and evidence of population structuring.[16] Petitioners' also argue that the "significance" factor is met. Currently available ecological and genetic studies of the LPC prove otherwise.

Petitioners' seek to redefine the meaning of "discrete" found in the Service's 1996 DPS policy. If statistically significant but trivial gene frequency differences are the arbiter of DPSs, then every population of birds sampled the same distances apart will qualify as DPSs. Clearly, the meaning of discrete or distinctive is that individuals can be identified

Ecological studies.—Many authors have attempted to divide the world into "ecoregions" or areas of currently similar vegetation history. It is apparent to those who have examined these different studies that there is no consensus on the appropriate number of regions, nor their boundaries. Instead, the Petition takes one particular hypothesis on ecoregions and claims that the boundaries defined ecologically are consistent with three regions of LPC distribution. This assertion is an illusion that is apparent when examining the boundary between putative DPSs Sand Sage Prairie and Mixed-Grass Prairie and Shortgrass CRP Mosaic in Figure 1 of the Petition, which shows an obviously arbitrary line that in fact has no ecological significance.

[16] Petition at 6-19.

Figure 1. Location of proposed Sand Sage Prairie DPS and background topology from Google Maps showing the lack of correspondence between the boundary and basic features of topology and vegetation.

Another way of examining shifting distributions is to use ecological niche modeling (Peterson 2001 and Elith *et al.* 2011). For example, NRECA constructed such models for the LPC using standard methods for the species at the Last Interglacial (122,000 years before present (ybp)), Last Glacial Maximum (21,000 ybp), mid-Holocene (6,000 ybp) and for comparison at the present. The models (Fig. E1) are in effect an estimate or prediction of where suitable climate existed at each time period. From the present model, it is clear that the LPC is more patchily distributed than the model suggests – it only suggests suitable areas, not whether the LPC is there at present. However, the model does match what is predicted to have been the historical distribution. What is apparent is that the LPC survived the tumultuous period known as the Last Glacial Maximum, and expanded dramatically, and by 6,000 years ago, was probably widespread. This illustrates the potential of the species to make dramatic recoveries from restricted ranges.

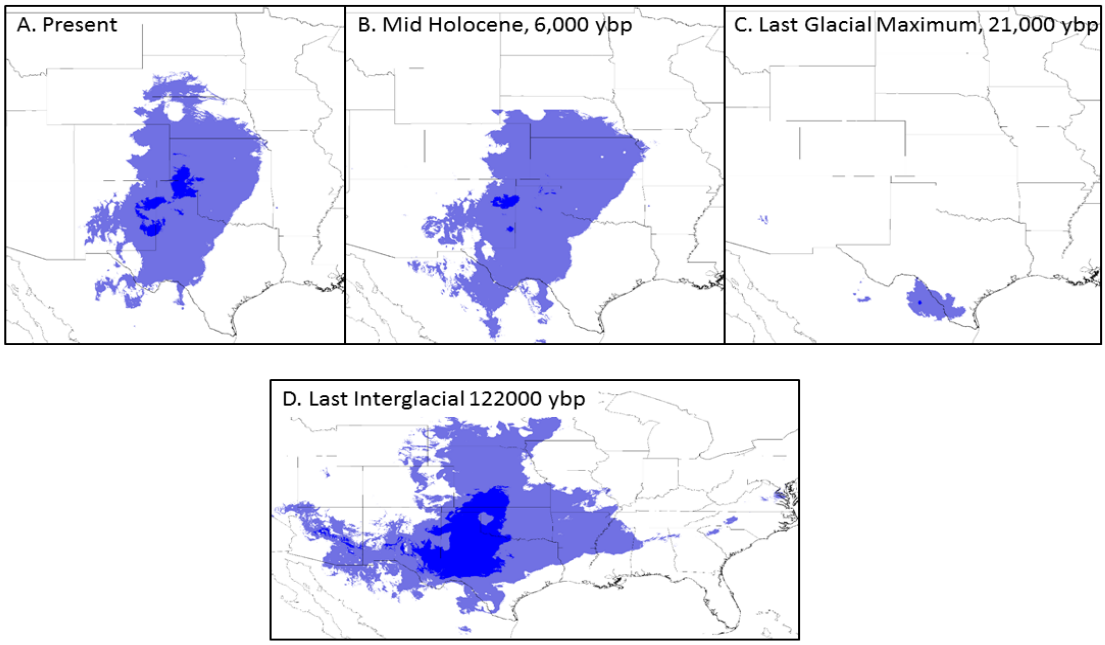

Figure E1. Estimates of the distribution of the LPC at three past time intervals derived from ecological climate-niche modeling. The maps show that at the last interglacial, the species was widespread, but underwent a dramatic reduction at the last glacial maximum, but recovered by the mid-Holocene (6,000 years before present). The species is therefore resilient over evolutionary time and major climate changes. The darkest shade represents the area of highest predicted occupancy. Software used included Maxent, and the environmental layers were the standard 19 Bioclim layers (http://www.worldclim.org/bioclim).

Genetic studies.—Several studies have been published on the genetics of LPC populations. Two recent studies are those of Pruett *et al.* (2011) and Oyler-McCance *et al.* (2016). Both of these studies relied on variation at microsatellite loci, which are selected because they contain genetic variation, and Pruett *et al.* (2011) also analyzed a small fragment of mitochondrial DNA (mtDNA). Microsatellite loci have a low likelihood of uncovering recent geographic structure because of their high effective population size (Zink and Barrowclough 2008), although they typically recover statistically significant differences in gene frequencies if there is enough spatial distance between sampling localities. The two studies claimed significant structure across the range of the LPC, however these claims merit closer scrutiny.

In the case of Pruett *et al.* (2011), only two populations (Oklahoma, Texas) were analyzed. It is a given that if two populations of essentially any species are sampled from the same distance apart as theirs were, that there will be significant differences in gene frequencies owing simply to the distance involved. Without sampling from the intervening areas, nothing can be made of their results. In any event, they found that 5% of the overall genetic variation was explained by the geography, meaning that 95% of the variation is shared between Texas and Oklahoma. Although the 5% was statistically significant, it is obviously of dubious biological significance.

In addition, their assertion that their data support differences in long-term effective population size is compromised by the low number of loci they analyzed.

Oyler-McCance *et al.* (2016) reported on the results of a microsatellite survey of 13 loci (again picked because of high variability, not at random) for 640 individuals from across the species' current range. Apart from the choice of loci, this is an extensive geographic sampling. The authors claimed that "The Shinnery Oak Prairie and Sand Sagebrush Prairie represented genetically distinct populations (F_{ST} > 0.034 and F_{ST} > 0.023 respectively)." This statement confuses statistically significant differences in gene frequencies with the meaning of the word "distinct." The latter word in this context means that individuals ought to be identifiable to either geographic area, and this is clearly not the case; again, less than 3.4% of the total genetic variance is explained by geographic area. This is not the accepted meaning of "distinct" and is not the intent of the ESA to protect populations that differ only statistically in minute differences in gene frequencies.

If this were the standard, nearly every species would consist of genetic units as long as they were sampled the same or greater geographic distances apart. For example, Munshi-South and Kharchenko (2010) reported that the population of the common deer mouse (*Peromyscus leucopis*) found in Central Park in New York City could be told apart genetically using the same methods of Oyler-McCance *et al.* (2016), yet the notion that this makes them endangered is far-fetched, to say the least.

Exhibit A of our comments provides a more detailed analysis of LPC genetics. Contrary to the Petitioners' claims, there are no meaningfully distinct segments of the overall LPC population. The Service should, as it did in the 90-day finding, reject the Petitioners' arguments.

C. The Asserted Threats to the LPC are Exaggerated, Remote and Misplaced

A species may be listed only where the best available science demonstrates it is in or near danger of going extinct. That is, the species must be endangered with becoming extinct, or threatened with becoming so endangered within the reasonably foreseeable future.

1. Habitat Fragmentation or Modification Does Not Threaten the LPC.

Petitioners' assert that there will be adverse impacts to LPC due to habitat fragmentation or modification. Petition at 50. However, Petitioners' ignore the significant efforts in place to protect and improve LPC habitat and connectivity. In addition, there are numerous efforts to manage human activity in LPC habitat, including implementation of measures that reduce or eliminate adverse impacts to LPCs. For example, various industry activities that are alleged to impact LPC habitat have voluntarily implemented measures to reduce impacts.

Moreover, the impacts associated with fragmentation are overstated. Recent information indicates LPC are far more tolerant of fragmented habitat than suggested. For example, population trend data using aerial survey indicates that 18.9% of LPC at counted range-wide

were observed on cropland.[17] Petitioners' claim that LPC depend on large, unfragmented, native rangelands, but the majority of the studies cited by the Petitioners' observed avoidance behavior. Importantly, avoidance does not equate to population decline. Rather, population declines have been more closely associated with extreme weather events.

Petitioners' identify a number of human activities that allegedly contribute to fragmentation of habitat including energy development, linear features, and the conversion of habitat to cropland. Much of the discussion relating to oil and gas development is misleading because it is based on *potential* losses (Dusang 2011, Rodgers 2016)[18] associated with some future basin build-out scenario, opposed to actual conditions. Moreover, the significant voluntary and regulatory measures that inure to the benefit of the LPC guard against these threats. Multiple states have implemented comprehensive operational restrictions. For example, Colorado has restrictive oil and gas permit requirements for activities that take place in LPC habitat, including buffers, seasonal timing and use restrictions, well density restrictions, mitigation, and reclamation requirements among others.[19] Further, powerline activities are addressed in the Range-wide plan and include activities from construction through decommissioning.[20] Recent information reported in the 2015 Annual Report, indicates significant industry participation in the WAFWA Conservation Agreement Program, and suggests that the Crucial Habitat Assessment Tool (CHAT) has been successful in siting operations outside "priority" habitat.[21] For example, an NRECA member utilized the CHAT tool to develop the route for a future transmission line that avoided LPC leks and Focal Areas.

In addition, powerline rights-of-way and activities occurring on lands managed by the Bureau of Land Management (BLM) would be subject to BLM's Manual 6840 and any other applicable Resource Management Plan. Manual 6840 establishes policy for the management of listed species or those proposed for listing and for "sensitive species," like LPC, on BLM lands. One of the Manual's objectives in the Manual is to "initiate proactive *conservation measures* that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA" (Manual 6840 at .01, emphasis added).

[17] McDonald, Lyman; Nasman, Kristen; Rintz, Try; Hornsby, Fawn; Gardner, Grant. 2016. Range-Wide Population Size of the Lesser Prairie-Chicken: 2012, 2013, 2014, 2015, and 2016.

[18] See Petition at 55-56.

[19] See, Van Pelt, W.E., S. Kyle, J. Pitman, D. Klute, G. Beauprez, D. Schoeling, A. Janus, J. Haufler, 2013. The Lesser Prairie-Chicken Range-wide Conservation Plan. Western Association of Fish and Wildlife Agencies. Cheyenne, Wyoming, pp. 367 at 6-8.

[20] Range-wide Plan at 29-30.

[21] Van Pelt, W.E., S.C. Kyle, J. C. Pitman, D.M. VonDeBur, M.E. Houts, 2016. The 2015 Lesser Prairie-Chicken Range-wide Conservation Plan Annual Progress Report. Western Association of Fish and Wildlife Agencies. Boise, Idaho at 22-25, 28, 60.

Habitat fragmentation will not result from conversion of habitat to cropland or loss of native rangeland. Most agricultural conversion to cropland happened prior to 2002, and Petitioners' have ignored the fact that LPC range is not static. There has been and will continue to be changes in LPC range, in part as a result of available resources. Population data suggests over the last decade or so, LPC in Kansas have been found in areas not previously known as LPC range (2016 Survey Data). This suggests that there may be a positive relationship for LPCs with some level of agricultural fragmentation, and areas subject to conservation protections, such as the CRP lands, may encourage dispersal. The data suggests that LPC have, can, and will respond to environmental stressors, without detriment to the population.

The threat from habitat fragmentation is overstated, and the voluntary conservation and regulatory measures that are in place ensure that impacts from human activities are minimized.

2. Overhead Powerline Threats on the LPC are Uncertain.

Petitioners' assert that overhead powerlines threaten the LPC. Petition at 62. Petitioners' claims are without merit and the cited scientific papers are flawed.

The ESA requires listing decisions to be based on the best scientific and commercial data available. The basic principles of the scientific method are to develop a hypothesis, develop a valid method to test that hypothesis, identify variables that would influence the results and reliability of that test, test the hypothesis to determine whether repeatable results are achieved, and identify objective conclusions that can be drawn from the results as well as remaining questions and uncertainties. A key requirement, of course, is to identify potential weaknesses in the results that would require additional study. Equally critical is to avoid confirmation bias, which can be evidenced by definitive conclusions unaccompanied by acknowledgement of potential weaknesses in the results.

Rather than rely on studies that adhere to these scientific method principles, a number of the papers that have influenced past policy and conservation decisions do not apply these basic tenets. For example, Pruett *et al.* (2009) has been cited as a resource for the development of positions on the potential impact of powerlines on LPC behavior, but, as discussed below, that paper fails to identify variables other than powerlines that could cause the LPC to avoid an area, is one-sided, and does not acknowledge potential weaknesses or areas that would require further study.

Avoidance of overhead powerlines (*i.e.,* distribution and transmission lines) and wind energy infrastructure, as well as oil and gas production, fences, and roads, has not been shown by data to have a deleterious population-level effect on LPC in any of the studies cited in the Petition (Pitman *et al.* 2005; Pruett *et al.* 2009; Hagen *et al.* 2011; Timmer 2012; Plumb 2015, Winder *et al.* 2014, 2015). Instead, these authors have assumed that avoidance on a local scale translates to a negative demographic effect at a population-level scale. However, avoidance on a local scale, whether measured from telemetry studies, lek counts, or lek density, does not necessarily result in lower nest success, recruitment, or survivorship, if birds moved away from the activity or disturbance. This was found to be the case, for example, with Greater Sage-Grouse in the Pinedale Planning Area of Wyoming, where sage-grouse have thrived in the population despite

being displaced locally from some areas by intensive oil and gas development (*i.e.*, Jonah Field and Pinedale anticline, Ramey *et al.* 2015).

Similarly, assertions that distribution and transmission powerlines are "barriers" to LPC movements (*i.e.*, Hagen *et al.* 2004, 2011; Pruett *et al.* 2009; Lautenbach 2015; Lavelle 2015; Plumb 2015) are based upon either speculation that is unsupported by data, or by selective citation of data. There are no data that show powerlines prevent movements of LPC across areas traversed by powerlines. For example, one of the most widely cited studies, Pruett *et al.* (2009), reported that LPC crossed powerlines less often than roads, and concluded that new powerlines and other tall structures will lead to avoidance of suitable habitat, serve as barriers to movement, and "increase fragmentation in an already fragmented landscape." However, we found that the differences in Pruett *et al.* (2009) were overstated for two reasons. First, the actual difference in number of powerline crossings versus major road crossings was only 1.5 to 2% (data from Table 2 of Pruett *et al.* (2009)). And second, we found that Pruett *et al.* (2009) did not acknowledge that the powerline they studied in LPC range was paralleled by a 60'-wide county road disturbance corridor. Pruett *et al.* (2009) also failed to mention that the area between the powerline and the "main road" was traversed by a natural gas pipeline that was installed during their study, as well as surrounded by cultivated land and human habitation. *See* **Exhibit B** of our comments for detail. These errors of omission, in the most detailed study of LPC and powerlines to date, reveal that the threat of powerlines is overstated.

Several other cited studies in the Petition, such as Plumb (2015), combined data from vastly different types of energy production - such as wind turbines combined with oil and gas development, and gravel roads combined with paved highways - for analyses of impacts to LPC. This is an aggregation and oversimplification of disparate data and infrastructure types that should have been analyzed separately to avoid erroneous conclusions about potential impacts to LPC landscape use.

3. Speculative Climate Change Effects Do Not Threaten LPC.

The Petition identifies climate change and extreme weather events as a threat to the LPC. Petition at 107. But the Service cannot consider speculative climate change effects in making any listing decision because it would be arbitrary, unlawful, and contrary to the Act's requirement to make designations based on the "best available science."[22] Any reliance on current climate models would push them far beyond the limits of their reliability, both spatially and temporally. The Service must recognize the uncertainty and limitations inherent in those climate model predictions.

Indeed, these significant limitations have been recognized by the Intergovernmental Panel on Climate Change ("IPCC") in its most recent evaluation of the state of climate modeling science.[23] Climate models are "the primary tools available for investigating the response of the

[22] 16 U.S.C. § 1533(b)(2).

[23] IPCC, Climate Change 2013: The Physical Science Basis, Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2013) ("IPCC AR5"), *available at* http://www.ipcc.ch/report/ar5/index.shtml.

climate system to various forcings, for making climate predictions on seasonal to decadal time scales and for making projections of future climate over the coming century and beyond."[24] Models vary considerably in complexity and application but are, in general, mathematical representations of the climate system, expressed as computer codes, and run on powerful computers.[25] Even the most complex models have limitations, and no model accurately simulates all climate-related processes. The IPCC describes in detail the many limitations and uncertainties that characterize current models.[26] As a result of these limitations, models cannot at this time accurately replicate climate over the observable past,[27] and even if models could replicate past climate, "there is no direct means of translating quantitative measures of past performance into confident statements about fidelity of future climate predictions."[28] The current state of climate science does not support impact projections below a continental or regional scale, and particularly not to the localized and highly complex habitat of LPC.[29]

Even if the Service is to consider climate change effects, the Center for Environmental Science, Accuracy, and Reliability (CESAR 2013) has found that "many climate projections predict that species ranges will shift, not shrink and in fact, conditions for some species might improve."[30] The report by CESAR (2013) used niche modeling to examine the current and past distribution of LPC. According to CESAR,

> The lesser prairie-chicken was one of those species which was distributed in a fragmented series of habitat patches south of the current range during the last glacial maximum, 21,000 years ago. The species survived this displacement and fragmentation and, as climate conditions ameliorated post-glacial retreat, they followed their northward-moving habitats to where they are today. Thus the species has survived previous significant climate changes [including range restrictions and prolonged drought] and has the potential to survive major, glacial-scale changes in earth's climate and still prosper.

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[24] *Id.* at 746.

[25] *Id.* at 749.

[26] *E.g., id*. at 751-755.

[27] *Id*. at 755, 767, 769-72.

[28] *Id*. at 745.

[29] *Id*. at 810-17 (describing the flaws and biases present in each methodology for obtaining regional modeling results and noting that downscaling for regional impacts "does not guarantee credible regional climate information"); see also id. at 826 ("correlations between local to regional climatological values and projected changes are small except for a few regions").

[30] CESAR (2013) Data Do Not Support the Proposed Listing of Lesser Prairie Chicken. Unpublished report and appendices. Center for Environmental Science, Accuracy & Reliability. Sacramento, CA. 177 pages. Available at: http://www.bestscience.org/uploads/4/3/7/3/43733283/lesser_prairie_chicken-_data_do_not_support_lpc_listing_report.pdfAccessed 25 January 2017.

Any listing that is based, in whole or in part, on potential threats from climate changes effects would be contrary to law and subject to potential litigation. Since speculative projections are based on unproven and unsupportable assertions about distant future conditions, they could be used to support the designation of practically any species. Moreover, such an approach is contrary to the terms and structure of the ESA, which guard against speculation. Finally, any reliance on projected impacts from climate change to support the listing of the LPC would be arbitrary and capricious.

In sum, there are no valid threats to the LPC such that listing is warranted under the ESA. The species is far from the point of being endangered with becoming extinct, or threatened with becoming so endangered, and there is basis upon which to conclude that it will reach that point in the reasonably foreseeable future. Accordingly, the Service should find that a listing is not warranted.

D. Extensive and Important Conservation Measures, Including the Range-wide Plan, Protect LPC and Their Habitat.

The Service must consider the existing regulatory mechanisms that protect the LPC across significant portions of its range. The Range-wide plan, for example, represents a cooperative conservation effort by five states, state fish and wildlife agencies, stakeholders, and property owners, with input from the public and FWS. Additionally, there has been a substantial investment of resources and land by a wide-range of industries, in partnership with States and local governments. These efforts, which are growing year by year, must be recognized, and should not be discouraged or overwritten by a listing of the LPC.

The Range-wide plan is a conservation strategy that provides the population and habitat needed to expand and sustain LPC. Pursuant to the Range-wide plan, private landowners, including NRECA members, voluntarily enter into formal agreements, such as the WAFWA Conservation Agreement and various CCAA agreements, with FWS to maintain and enhance land within the LPC range.

According to WAFWA, "[t]he strategy identifies a desired population goal deemed adequate to provide for good representation of adequately sized habitat patches to provide for resiliency in populations, and with enough patches to provide for redundancy to support populations that persist in the long term." Western Association of Fish and Wildlife Agencies, The 2015 Lesser Prairie-Chicken Range-Wide Conservation Plan Annual Progress Report (Report), March 2016, at 8.

WAFWA's annual Report summarizes the status of Range-wide plan and sets forth the results and analysis of surveys conducted in 2015. During 2015, WAFWA conducting a spatial audit of all enrollments for the WCA and CCAA agreements. *Id.* at 20. Notwithstanding the vacatur of the LPC Listing Decision, enrollment in the plans was steady and increasing. *Id.* at 21. In 2015, net enrollment increased by 464,629 acres. *Id.*

As of December 15, 2015, there were 68 companies enrolled with active WCA contracts. 14 new companies were enrolled during 2015, including two rural electric cooperatives. NRECA cooperatives may enroll individually in the Range-wide plan or G&Ts may enroll as a group,

covering their member distribution cooperatives. Per the 2015 report, actively enrolled NRECA members include: Bailey County Electric Cooperative (Texas), Central Valley Electric Cooperative, Inc. (New Mexico), Greenbelt Electric Cooperative, Inc. (Texas), Northfolk Electric Cooperative, Inc. (Oklahoma), Northwestern Electric Cooperative, Inc. (Oklahoma), Roosevelt County Electric Cooperative, Inc. (New Mexico), Tri-County Electric Cooperative, Inc. (Texas), Alfalfa Electric Cooperative (Oklahoma), Cimarron Electric Cooperative (Oklahoma), Kiwash Electric Cooperative (Oklahoma), Western Farmers Electric Cooperative (Oklahoma), Sunflower Electric Power Corporation (Kansas), Deaf Smith Electric Cooperative, Inc. (Texas, new enrollment in 2015), Lyntegar Electric Cooperative (Texas), Ninnescah Rural Electric Cooperative (Kansas), and North Plains Electric Cooperative (Texas, new enrollment in 2015).

The below table (found on page 28 of the Report) provides a summary of the acreage enrolled in the WCA, totaling *more than 2,550,605 acres of LPC habitat*, by ecoregion and industry participants. Significant amounts of private, local and state-owned land have been enrolled in conservation agreements -- all to benefit the LPC. The dollar and ecological value is astounding.

Summary of Acres Enrolled in the WAFWA Conservation Agreement
By Ecoregion, CHAT Category, and Industry Type

CHAT	Mixed Grass Prairie		Sand Sagebrush Prairie		Shinnery Oak Prairie		Shortgrass Prairie	
	Industry	**Acres**	**Industry**	**Acres**	**Industry**	**Acres**	**Industry**	**Acres**
1	Electric	44,546	Electric	56,047	Electric	27,122	Electric	24,818
	Oil & Gas	26,598	Oil & Gas	4,029	Oil & Gas	329	Oil & Gas	1,396
	Pipeline	10,411	Pipeline	16,658	Pipeline	871	Pipeline	1,725
	Total	**81,554**	**Total**	**76,734**	**Total**	**28,322**	**Total**	**27,939**
2	Electric	37,984	Electric	5,344	Electric	32,435	Electric	4,433
	Oil & Gas	25,005	Oil & Gas	63	Oil & Gas	0	Oil & Gas	383
	Pipeline	9,012	Pipeline	422	Pipeline	869	Pipeline	270
	Total	**72,001**	**Total**	**5,829**	**Total**	**33,305**	**Total**	**5,086**
3	Electric	375,010	Electric	40,451	Electric	308,619	Electric	27,218.9
	Oil & Gas	264,471	Oil & Gas	1,735	Oil & Gas	1,427	Oil & Gas	1,453.7
	Pipeline	47,599	Pipeline	8,645	Pipeline	8,360	Pipeline	1,173.6
	Total	**687,080**	**Total**	**50,831**	**Total**	**318,406**	**Total**	**29,846**
4	Electric	349,136	Electric	165,784	Electric	292,168	Electric	120,084.8
	Oil & Gas	117,281	Oil & Gas	1,292	Oil & Gas	0	Oil & Gas	5,468.3
	Pipeline	52,632	Pipeline	17,893	Pipeline	5,794	Pipeline	6,138.2
	Total	**519,049**	**Total**	**184,970**	**Total**	**297,962**	**Total**	**131,691**
	Mixed Grass	**1,359,684**	**Sand Sagebrush**	**318,364**	**Shinnery Oak**	**677,995**	**Shortgrass**	**194,563**

An additional 134 companies were enrolled in the CCAA for oil and gas and related activities, such as roads, pipelines and electric service for oil and gas facilities. *Id.* at 30. Of those 134 companies, two were new companies added to the program in 2015. These 134 companies have enrolled a total of 7,876,547 acres. See Table 7, Report at 35.

Since the inception of the Range-wide plan, WAFWA has invoiced approximately $49.9 million in enrollment and impact fees, or which 87.5 percent, or $43.6 million, is restricted for conservation efforts. *Id.* at 85. The remaining 12.5 percent, or $6.2 million, is used for program administration. *Id.* The availability of these funds to benefit the species and its habitat cannot be emphasized enough.

In addition to the WAFWA Range-wide plan, a number of other voluntary conservation programs across the LPC range have helped stabilize and grow LPC populations. FWS must consider each of these efforts in its 12-month finding. As summarized by WAFWA in the Report, several of the key conservation efforts are:

Lesser Prairie-Chicken Conservation Initiative and Other NRCS Programs: In 2010, NRCS launched the LPC Conservation Initiative (LPCI) "to increase the abundance and distribution of the LPC and its habitat while promoting the overall health of grazing lands and the long-term sustainability of ranching operations." Report at 48. FWS completed a biological opinion of the LPCI on August 13, 2014, which describes 28 conservation practices that could be implemented through the program that FWS deems to be benign or beneficial to the LPC. *Id.* Highlights from 2015 include:

- A total of 179,805 acres of prescribed grazing were applied through LPCI during 2015. *Id.*

- In addition, a total of 9,438 acres were treated with brush management and range planting was applied to 47 acres during 2015. *Id.*

- Many of those acres were previously unusable by LPC, and all of the acres were at least in a degraded condition prior to treatment.

- In addition to these applied practices, another 114,438 newly contracted acres were added to the program where practices will be applied in subsequent years. *Id.*

Conservation Reserve Program: The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners, administered by the Farm Service Agency, that incentivizes landowners to take cropland out of production and maintain it in permanent vegetation *(e.g.* native grasses and forbs). Report at 49. The conversion of these lands back to permanent vegetation promotes habitat connectivity. CRP enrollment is fluid as individual contracts expire at the end of a 10 or 15-year term and new contracts get enrolled in other locations. *Id.* The total acres enrolled in the program has remained fairly constant since 1998. *Id.* Currently, there are nearly 3,229,850 acres enrolled within the range of the LPC. *Id.*

Partners for Fish and Wildlife Program: The FWS Partners for Fish and Wildlife Program (PFW) restores, improves and protects fish and wildlife habitat on private lands through partnerships between FWS, landowners and others. *Id.* at 50. The objectives of this program are to: (1) restore, enhance and manage private lands for fish and wildlife habitat; (2) significantly improve fish and wildlife habitat while promoting compatibility between agricultural and other land uses; (3) restore declining species and habitats; and, (4) promote "a widespread and lasting land use ethic." *Id.* In 2015, the PFW Program contracted habitat restoration and improvement on 8,770 acres in the Mixed Grass Ecoregion. *Id.*

Candidate Conservation Agreement: Prior to the threatened listing of the LPC, there was a CCA available to landowners operating on public land in New Mexico and CCAAs available to all other landowners in New Mexico, Texas, and Oklahoma. *Id.* at 51. Enrollment stopped on the effective listing date of the LPC (May 12, 2014). However, enrollment in the Oklahoma

CCAA reopened shortly after the vacatur of the listing decision on September 1, 2015. That CCAA is now at its 400,000 acreage cap, so no new enrollments are being accepted. None of the other landowner CCA/CCAAs have reopened. Currently, implementation is occurring on 886,281 acres enrolled in the landowner CCA in New Mexico and 2,027,920 acres enrolled in all three CCAAs. *Id.* at 51-52.

These conservation measures are summarized in the chart below, which can be found at pp. 53-54 of the Report. Importantly, the conservation programs are growing year over year, and the collective impact of these efforts on the LPC and its habitat cannot be understated.

Table 13. Public land and conservation program acreage within each LPC service area by CHAT category, 2015.

Service Area – Location	WAFWA Term Contracts	WAFWA Permanent Conservation Agreements[a]	WAFWA Non-Offset Agreements	Conservation Reserve Program	NRCS Lesser prairie-chicken initiative[b]	USFWS Partners for Fish & Wildlife	State Wildlife Agency Private Land Programs[c]	New Mexico Ranching CCA	New Mexico Ranching CCAA	Texas Ranching CCAA[d]	Oklahoma Ranching CCAA[e]	Potential Stronghold Acreage[f]	Other Public Land Acreage[g]	Total[h]
Shinnery Oak														
CHAT 1	14,088	1,057	0	109,470	60,015	0	ND	ND	ND	48,262	NA	360,780	53,957	647,629
CHAT 2	0	396	0	131,336	9,008	0	ND	ND	ND	17,433	NA	0	91,847	250,020
CHAT 3	2,001	110	0	674,777	21,344	0	ND	ND	ND	110,937	NA	12,348	1,565,585	2,387,102
CHAT 4	16	0	0	200,659	2,013	0	ND	ND	ND	21,751	NA	0	540,588	765,027
Total		*1,563*	*0*	*1,116,243*	*92,381*	*0*	*ND*	*886,281*	*1,044,181*	*198,383*	*NA*	*373,128*	*2,251,978*	*5,964,138*
Mixed Grass														
CHAT 1	42,165	0	1,038	116,727	43,999	ND	0	NA	NA	241,985	146,995	28,448	46,311	667,668
CHAT 2	536	0	0	62,772	5,366	ND	0	NA	NA	33,055	39,839	71	18,276	159,915
CHAT 3	823	0	966	277,883	16,115	ND	0	NA	NA	81,093	158,094	1,610	160,371	696,955
CHAT 4	17,726	0	6,908	127,096	2,420	ND	55	NA	NA	56,598	27,696	0	31,480	269,979
Total	*61,266*	*0*	*8,912*	*584,477*	*67,900*	*8,770*	*55*	*NA*	*NA*	*412,731*	*372,624*	*30,129*	*256,438*	*1,803,302*
Sand Sagebrush														
CHAT 1	12,689	0	0	159,877	9,758	0	4,250	NA	NA	NA	NA	33,884	166,388	386,846
CHAT 2	0	0	0	20,758	0	0	0	NA	NA	NA	NA	0	13,673	34,431
CHAT 3	0	0	0	346,915	136	0	0	NA	NA	NA	NA	4,280	190,375	541,706
CHAT 4	0	0	0	428,559	396	0	40	NA	NA	NA	NA	16,152	255,026	700,173
Total	*12,689*	*0*	*0*	*956,108*	*10,289*	*0*	*4,290*	*NA*	*NA*	*NA*	*NA*	*54,316*	*625,463*	*1,663,155*
Shortgrass														
CHAT 1	1,113	0	0	167,931	8,082	0	302	NA	NA	NA	NA	8,901	18,803	205,132
CHAT 2	4,029	0	0	11,569	0	0	220	NA	NA	NA	NA	0	0	15,818
CHAT 3	0	0	0	160,761	975	0	788	NA	NA	NA	NA	0	23,430	185,954
CHAT 4	0	0	0	232,762	178	0	1,469	NA	NA	NA	NA	0	10,473	244,882
Total	*5,142*	*0*	*0*	573,023	*9,235*	*0*	*2,779*	*NA*	*NA*	*NA*	*NA*	*8,901*	*52,707*	*651,787*
Range-wide														
CHAT 1	70,055	1,057	1,038	554,005	121,854	ND	4,552	ND	ND	290,248	146,995	432,013	285,460	1,903,069
CHAT 2	4,565	396	0	226,434	14,375	ND	220	ND	ND	50,489	39,839	71	123,797	460,186
CHAT 3	2,824	110	966	1,460,335	38,570	ND	788	ND	ND	192,029	158,094	18,238	1,939,761	3,811,715
CHAT 4	17,743	0	6,908	989,076	5,006	ND	1,564	ND	ND	78,348	27,696	16,152	837,568	1,980,061

Service Area – Location	WAFWA Term Contracts	WAFWA Permanent Conservation Agreements[a]	WAFWA Non-Offset Agreements	Conservation Reserve Program	NRCS Lesser prairie-chicken initiative[b]	USFWS Partners for Fish & Wildlife	State Wildlife Agency Private Land Programs[c]	New Mexico Ranching CCA	New Mexico Ranching CCAA	Texas Ranching CCAA[d]	Oklahoma Ranching CCAA[e]	Potential Stronghold Acreage[f]	Other Public Land Acreage[g]	Total[h]
Grand Total	95,187	1,563	*8,912*	3,229,850	179,805	*8,770*	7,124	886,281	1,044,181	611,115	*372,624*	466,474	3,186,585	10,098,471

ND = no data provided; NA = not applicable

[a] The WAFWA acquired 1,604 acres but the existing perimeter fence does not currently encompass the entire property. The fence will be moved to the correct boundary in the near future so that a WAFWA management plan can be implement across the entire property.

[b] These figures represent the acres of prescribed grazing (528) that were implemented in 2015. This practice is a core conservation practice that is supposed to occur on every contracted LPCI acre. The acreage contained within other NRCS programs was not available for this report but those efforts also provide benefit to the LPC.

[c] Data were provided by the Kansas Department of Wildlife, Parks, & Tourism; Oklahoma Department of Wildlife Conservation; and Colorado Parks and Wildlife. The acreages are not unique because they are summed across numerous conservation practices that could have overlapped.

[d] An additional 60,511 acres are enrolled outside the CHAT areas because the eligibility area for the program is larger than the CHAT boundary.

[e] An additional 21,375 acres are enrolled outside the CHAT areas because the eligibility area for the program is larger than the CHAT boundary.

[f] Includes acreages from properties identified as potential strongholds in the WAFWA range-wide plan (Van Pelt et al. 2013).

[g] This category includes other protected or publicly owned properties not identified as potential strongholds in the range-wide plan. These acreages are owned by U.S. Department of Defense, Non-Government Organizations, State Land Boards, State Parks, Recreation, and Wildlife Agencies, U.S. Fish & Wildlife Service, U.S. Bureau of Land Management, U.S. Forest Service, Privately Owned Parks, U.S. National Park Service, Agricultural Research Service, U.S. Bureau of Reclamation, and City or County Government.

[h] Some of the acreages overlap the same areas and no data were available for some of the listed programs or the EQIP which also provides benefit to LPC.

Summary of all Conservation Efforts in LPC Range: During 2015, WAFWA estimates that at least 6.4 million acres of private land were enrolled in voluntary conservation programs across the LPC Range. *Id.* at 54. Including the Range-wide plan, a total of 10,098,471 acres are now under conservation protection to benefit the LPC. More than half of the land that is set aside to benefit the LPC is privately owned.

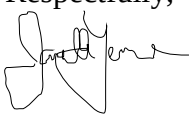
The best available information proves that enrollment in the Range-wide plan and other voluntary conservation programs increased in 2015, despite the vacatur of the prior listing decision. Survey results confirm that LPC populations have stabilized and are growing in key areas. Conservation measures have expanded the LPC habitat and ensure that it is better protected, improving in quality and connectivity, thus contributing to the resiliency of the species. Listing of the species is simply not warranted under these circumstances.

V. Conclusion

In short, the best available scientific and commercial data clearly demonstrate that the LPC population is stable, if not expanding. The FWS should determine that the species does not warrant protections under the ESA in light of the substantial existing conservation measures in place at the Federal, State, and local level. To determine otherwise, would be contrary to the law and policy and discourage future public/private endeavors to work cooperatively to benefit species.

Thank you for considering our comments and position. Should you have any questions regarding our comments or if we can be of further assistance as the Service works on the SSA, please contact Janelle Lemen by phone at (703) 907-5790 or email at janelle.lemen@nreca.coop.

Respectfully,



Janelle Lemen
Senior Principal, Environmental Issues
National Rural Electric Cooperative Association

Enclosures (Exhibits A-D)

cc: Clay Nichols, FWS

Exhibit A: Distinct Population Segment Genetic Analysis

Since the publication of the data in Pruett *et al.* (2011) and Oyler-McCance *et al.* (2016), a new study was published, "Differential introgression and effective size of marker type influence phylogenetic inference of a recently divergent avian group (Phasianidae: *Tympanuchus*)" by S. J. Galla and J. A. Johnson in the prestigious journal *Molecular Phylogenetics and Evolution*. This study was designed for a different purpose than evaluating the distinctiveness of LPC populations; and unlike the earlier papers, the data were made public and are reanalyzed below. The study involved sequences from all members of the genus, but for the purpose of this response to the Petition, the sequences for four autosomal genes (bi-parental inheritance), five sex-linked (or Z-linked; inherited along paternal lines) genes, and mtDNA (inherited via mothers) from the Lesser Prairie-Chicken (LPC) and a sampling of the other species (Sage-Grouse, Sharp-tailed Grouse, Greater Prairie-Chicken) were analyzed. These sequences were downloaded and "concatenated", which means that sequence from each of the loci were strung end-to-end.

The DNA sequences represented 10 individuals from New Mexico, 10 from Kansas and 8 from Oklahoma, and each individual was represented by 4034 base pairs of data. Several analyses were conducted. The first analysis involved construction of a network that shows genetic connectivity between the concatenated sequences, based on autosomal and sex-linked genes only, owing to the fact that some feel that mtDNA sequences can be misleading. The figure G1 shows that individuals from the three populations are intermingled, thereby failing to support genetic distinctiveness of the three proposed DPSs. To be clear, if there were three groups, the circles (individual birds) with the same colors would be connected with lines apart from circles with other colors (groups).

Inclusion of mtDNA, which often reveals greater structure than nuclear DNA, shows the same result (Figure G2), namely that the individuals from the three populations of LPC do not correspond to three genetic clusters, and therefore, do not support designation of three DPSs. The same lack of support is apparent when Greater Prairie-Chicken samples and one Attwater Prairie-Chicken sample are included in the analysis (Figure G3).

As an example of a study that does provide a basis for conversation about conservation, Barry and Tallmon (2010) compared populations of the Spruce Grouse in the Pacific Northwest and found that the subspecies *Falcipennis canadensis isleibi*, from the Alexander Archipelago of southeast Alaska, to differ considerably from other populations, with a fixation index (F_{st}) of 0.35. That is, 35% of the genetic variation is explained by the geographic isolation of this population, whereas in the LPC, the value was 10 times less (just 3.4%).

Quantitative estimates of the 4034 base pair data set back up the networks. In Table G1, estimates of variation and differentiation are shown. Nucleotide diversity, a measure of genetic variation, is similar across the three samples, with Kansas being slightly lower. The Chi-Square test for population differentiation is not significant, showing no overall significant genetic structuring across the three populations ($P < 0.001$). Thus, the analysis of the best available genetic data does not support the contention that there are three DPSs of LPC nor that any of the three are more or less variable.

All of the data used in this analysis are publicly available via the GenBank database (https://www.ncbi.nlm.nih.gov/genbank/).

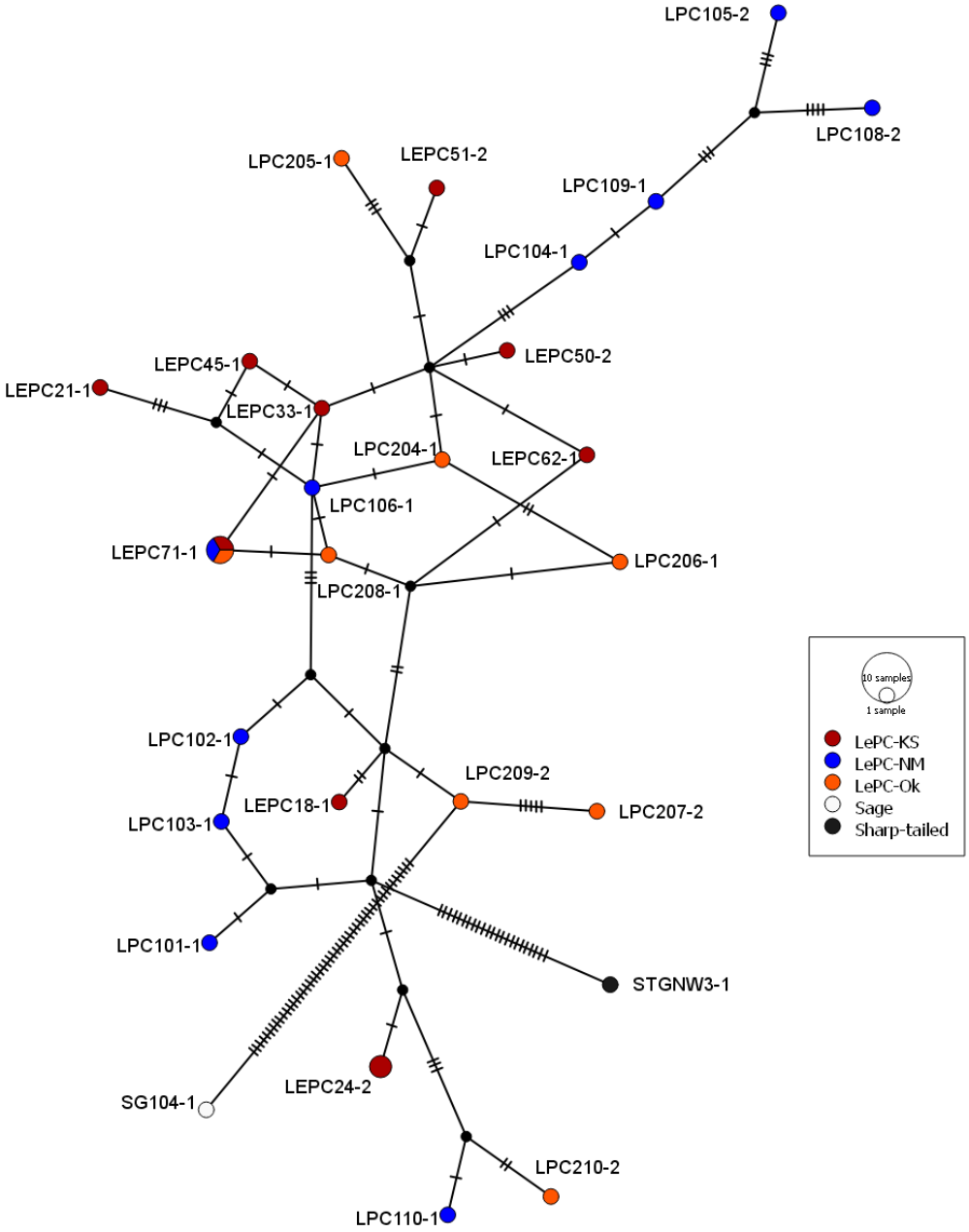


Figure G1. Network showing relationships between different LPCs from three states (Kansas, Oklahoma, New Mexico), and revealing that the three populations do not form genetic clusters (*i.e.*, they are not all adjacent in the network). "STGN" refers to a Sharp-tailed Grouse, and "SG" refers to a Sage-Grouse. This network was based solely on nuclear DNA (autosomal [4 loci] and Z-linked [5 loci]). Each cross-hatch represents a single mutation event. Small black circles represent unobserved alleles. Network produced using PopArt software http://popart.otago.ac.nz/howtocite.shtml.

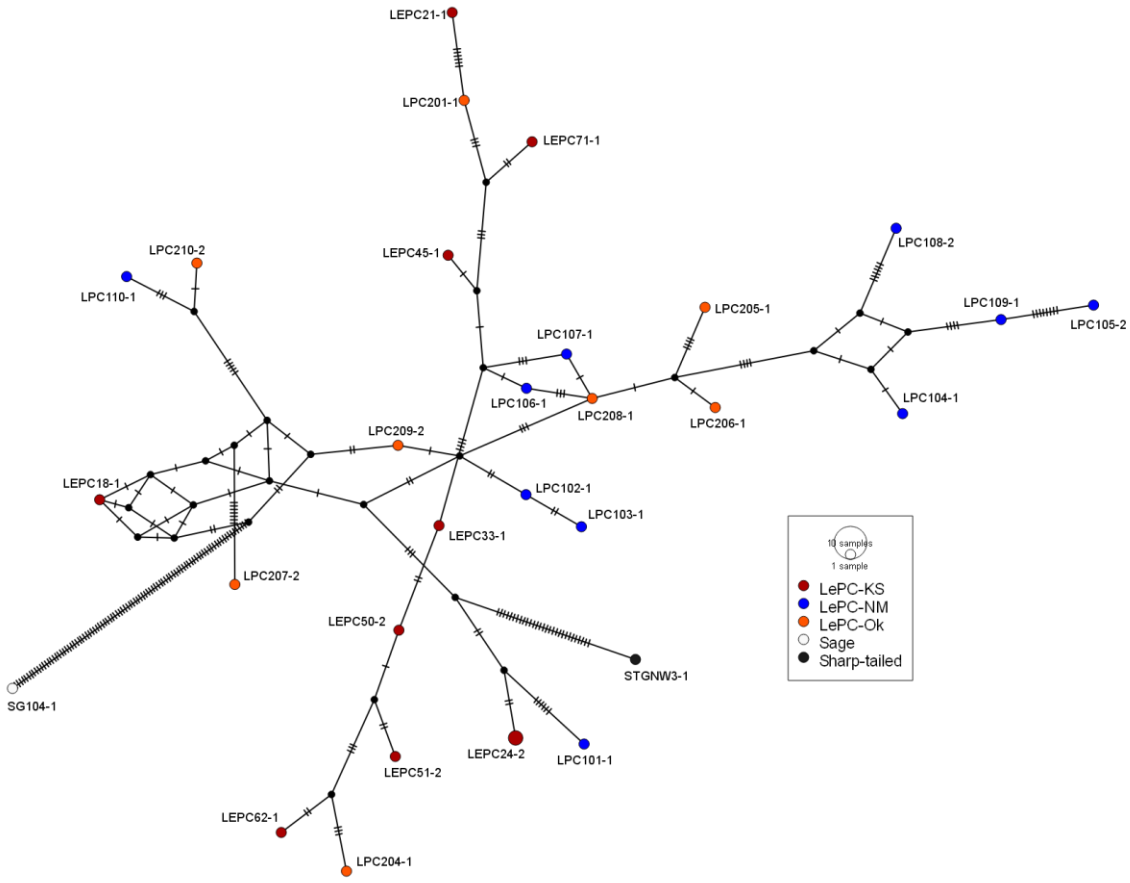


Figure G2. Network showing relationships between different LPCs from three states (Kansas, Oklahoma, New Mexico), and revealing that the three populations do not form genetic clusters (*i.e.*, they are not all adjacent in the network). "STGN" refers to a Sharp-tailed Grouse, and "SG" refers to a Sage-Grouse. This network was based on 4034 base pairs from nuclear DNA (autosomal [4 loci], Z-linked [5 loci]) and mtDNA (control region). The much longer lines leading to Sage-Grouse (SG104-1) and Sharp-tailed Grouse (STGNNW3-1) result from the greater resolution provided by mtDNA. Each cross-hatch represents a single mutation event. Small black circles represent unobserved alleles.

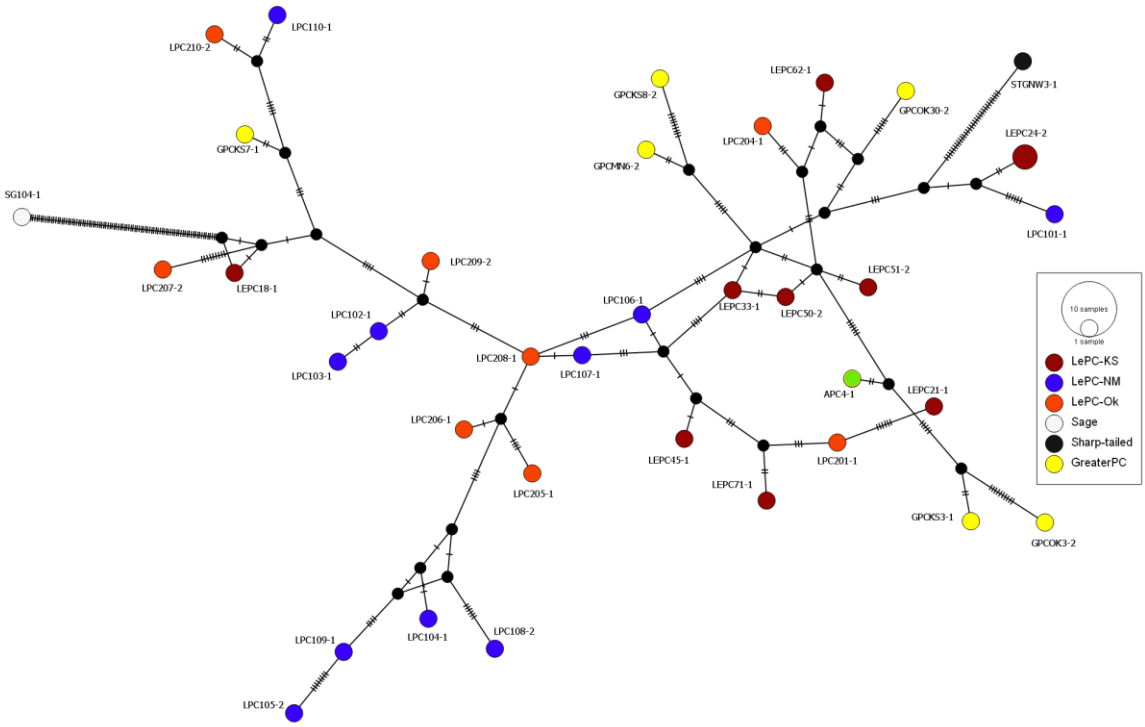


Figure G3. Network showing relationships between different LPCs from three states (Kansas, Oklahoma, New Mexico) and selected individuals of Greater Prairie-Chicken, and revealing that the three populations do not form genetic clusters (i.e., they are not all adjacent in the network)and are in fact intermingled with Greater Prairie-Chicken. "STGN" refers to a Sharp-tailed Grouse, and "SG" refers to a Sage-Grouse. This network was based on 4034 base pairs from nuclear DNA (autosomal [4 loci], Z-linked [5 loci]) and mtDNA (control region). The much longer lines leading to Sage-Grouse (SG104-1) and Sharp-tailed Grouse (STGNNW3-1) result from the greater resolution provided by mtDNA. Each cross-hatch represents a single mutation event. Small black circles represent unobserved alleles.

Table G1. Measures of genetic variation and differentiation in Lesser Prairie-Chickens inferred from 4034 bp of nuclear (autosomal, sex-linked) and mitochondrial DNA. The freeware DNAsP was used.

Number of Populations Included: 3
Selected region: 1-4034 Number of sites: 4034
Sites with alignment gaps are: Excluded
Total sites (excluding alignment gaps): 3947

Population 1: LePC_KS
Number of sequences: 10
Number of segregating sites, S: 33
Number of haplotypes, h: 9
Haplotype diversity, Hd: 0.97778
Average number of differences, K: 10.91111
Nucleotide diversity, Pi: 0.00276

Population 2: LePC_NM
Number of sequences: 10
Number of segregating sites, S: 35
Number of haplotypes, h: 10
Haplotype diversity, Hd: 1.00000
Average number of differences, K: 12.73333
Nucleotide diversity, Pi: 0.00323

Population 3: LePC_OK
Number of sequences: 8
Number of segregating sites, S: 39
Number of haplotypes, h: 8
Haplotype diversity, Hd: 1.00000
Average number of differences, K: 12.25000
Nucleotide diversity, Pi: 0.00310

========== Genetic Differentiation Estimates ==========
Chi-square (table), Chi2: 56.000 P-value of Chi2: 0.3272 ns; (df = 52)
HBK 1992, Hs: 0.99192 Hst: 0.00545

========== Gene Flow Estimates ==========
Haplotype Data Information
Nei 1973
Gst: 0.00551 Nm: 45.13
Sequence Data Information
Nei 1982
DeltaSt: 0.00035 GammaSt: 0.11353 Nm: 1.95
Lynch and Crease 1990 (with Jukes and Cantor correction)
Nst: 0.05594 Nm: 4.22
Hudson, Slatkin and Maddison 1992
Fst: 0.05591 Nm: 4.22

Exhibit B: Omissions from Pruett *et al.* (2009)

Below is figure from Pruett *et al.* (2009) published in *Conservation Biology* and which appeared in an influential news feature on Lesser Prairie-Chicken (LPC) in the prominent journal *Science* (Lavelle 2015). As the caption indicates, the figure was used to illustrate how LPCs avoid powerlines. However, when we zoomed into the same area using Google Earth imagery it was clear that there was not only a rural distribution powerline between the two LPC clusters, but also a parallel county road (E0280), and a gas pipeline and areas of cultivation between the "major road" and "powerline" (*See* Figures 2 and 3 below). Neither Pruett (2009) or Lavelle (2015) mentioned any of these additional potential disturbances, or that the pipeline was constructed between 1996 and 2003 (*i.e.*, during Pruett's study), an obvious error of omission and selective presentation of information. Such omissions bias the interpretation of results and can unduly influence decision makers.

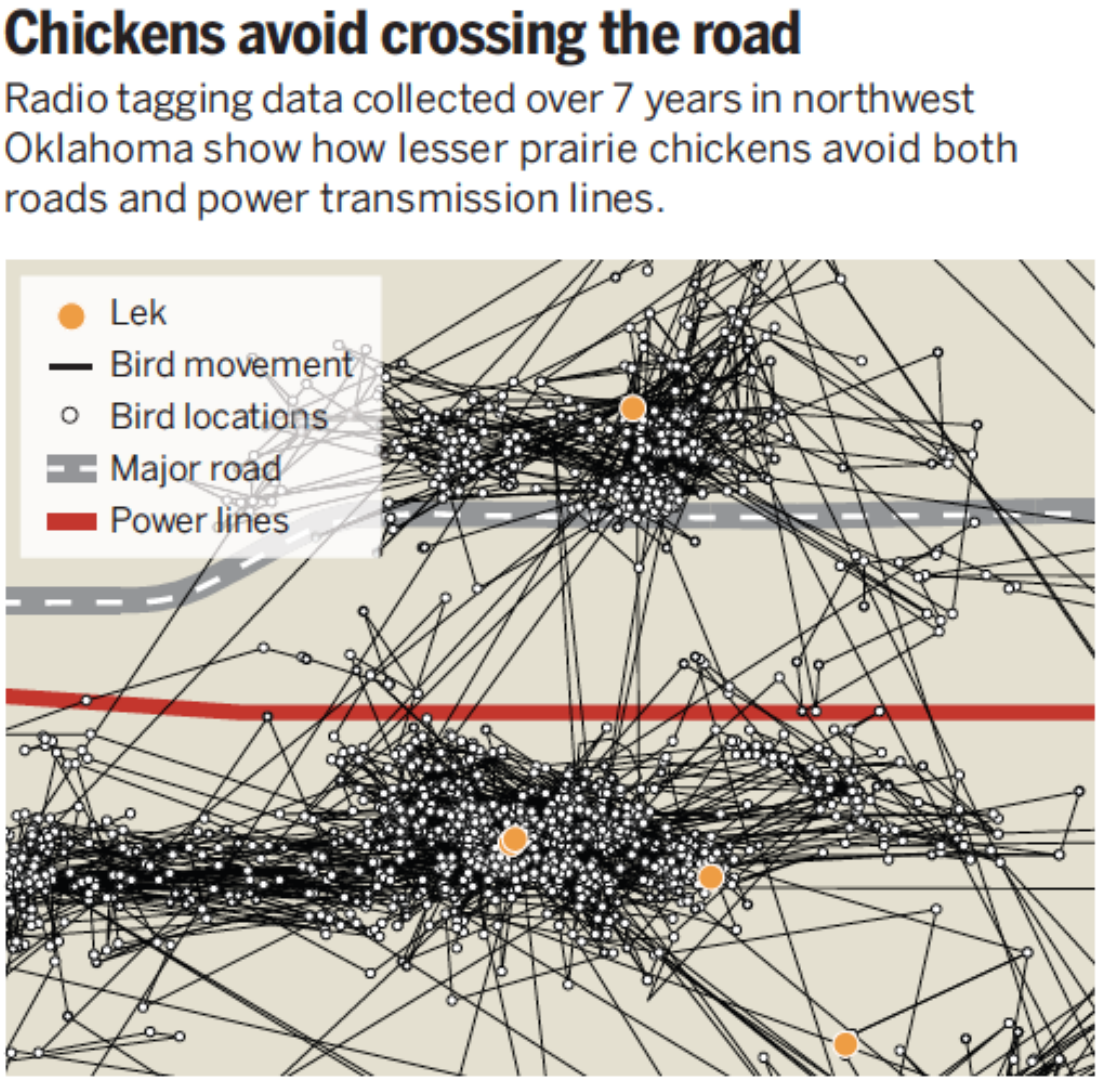


Figure 1. From Lavelle, M. (2015). Last Dance? An urgent effort to save the West's iconic lesser prairie chicken could point the way to a truce in other endangered-species battles. *Science* 348 (6241):1300-1305.

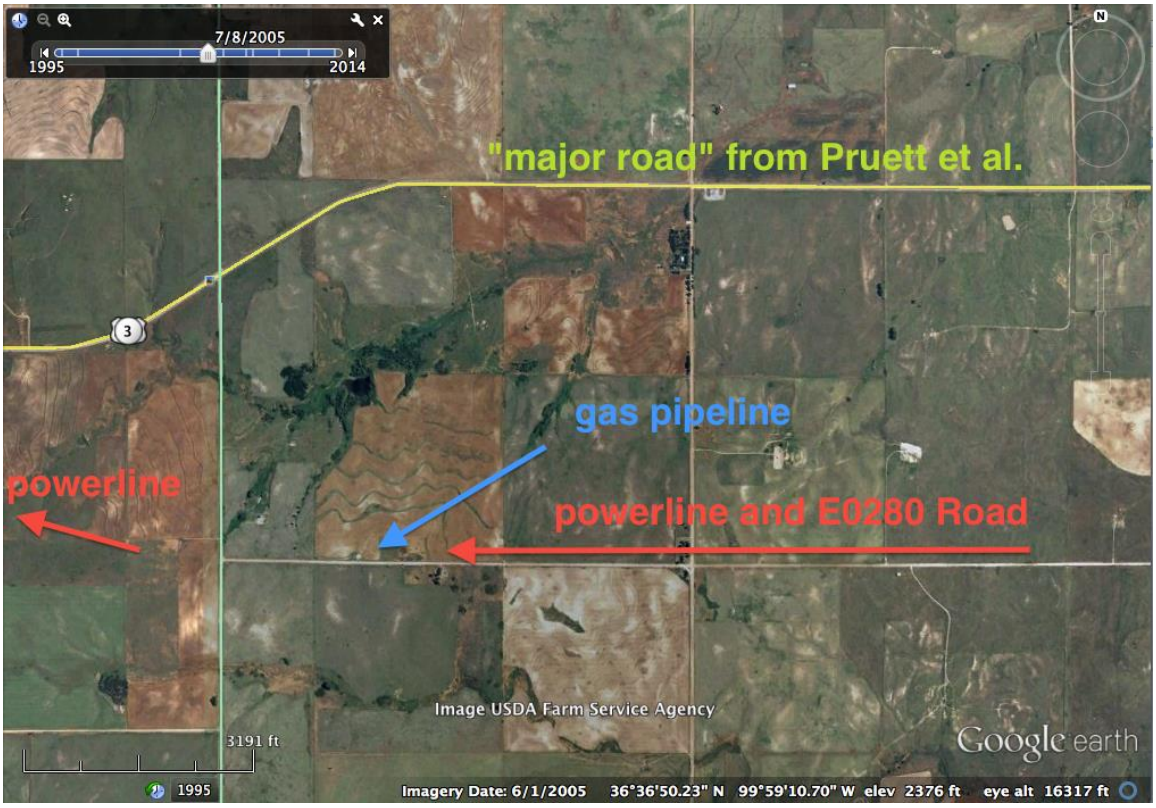


Figure 2. Google Earth imagery depicts the area shown in the figure from Pruett *et al.* (2009) and Lavelle (2015). The image is annotated to show the parallel routes of the powerline and E0280 Road, gas pipeline route (and valve station), as well as cultivated fields between the powerline route and "major road" (Hwy 412 in southwestern Harper County, Oklahoma), in 2005, during Pruett *et al.*'s (2009) study. Earlier image files were of lower resolution, but consistently showed the same features.

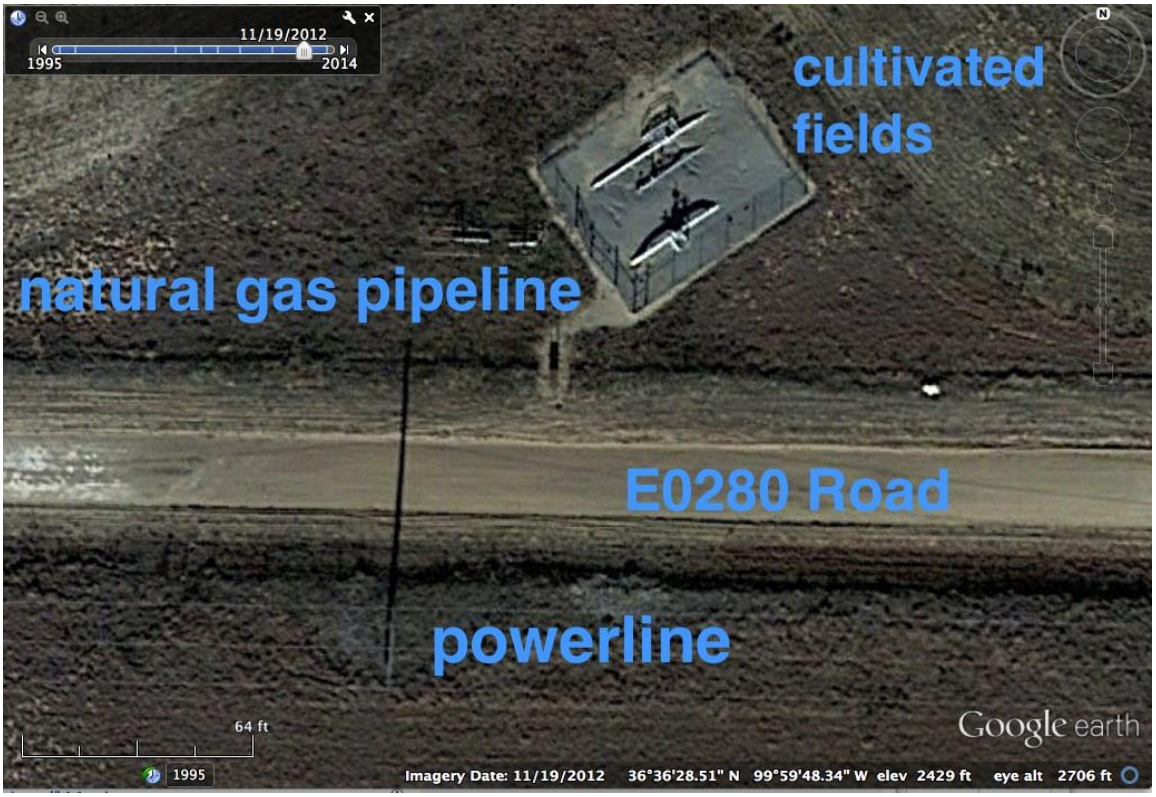


Figure 3. Google Earth imagery detail along the powerline route from Pruett *et al.* (2009) Figure 1 and Lavelle (2015). The image is annotated to show the parallel routes of the powerline and E0280 Road, and location of gas pipeline valve station. This image file is from 2012, but earlier image files show the same features, but at a lower resolution.

Exhibit C: Anthropogenic Climate Change and Lesser Prairie-Chicken (LPC)

Grisham *et al.* (2016) make the extraordinary claim that anthropogenic CO_2 emissions are driving global climate change that will lead to the extirpation of LPC, unless global atmospheric CO_2 concentrations are decreased to 350 parts per million (ppm). The basis of their claim is that Global Circulation Models (GCMs) accurately account for all natural and manmade climate drivers and can reliably predict future climate states. The analyses, conclusions, and management recommendations of Grisham *et al.* (2016) are built on this assumption.

The magic number of 350 ppm as the target for LPC conservation was based on the results of a non-peer reviewed feature article in *Nature* by Rockström *et al.* (2009; erroneously cited as Rockström *et al.* 2011 in Grisham *et al.* 2016). That paper, titled "A safe operating space for humanity," identified "planetary boundaries that must not be transgressed" with the intent of "preventing human activities from causing unacceptable environmental change." The editor of *Nature,* acknowledged that "the science is preliminary" and that, "such numerical values [advocated by Rockström *et al.* (2009)], however, should not be seen as targets."

As for the critical atmospheric CO_2 concentration threshold of 350 ppm, Rockström *et al.* (2009) based this threshold on the 2007 Intergovernmental Panel on Climate Change (IPCC) report's use of CO_2 concentration and temperature reconstructions for the Pliocene (2.6 to 5.3 million years before present). However, not acknowledged by Rockström *et al.* (2009) or Grisham *et al.* (2016), is the fact that in 2013 the IPCC stated that "uncertainties associated with these marine [proxy] estimates remain difficult to quantify." The IPCC also concluded with "medium confidence" that Pliocene "CO_2 levels were above pre-industrial interglacial concentration (~280 ppm) and did not exceed ~450 ppm during the Pliocene, with interglacial values in the upper part of that range between 350-450 ppm." Thus, the 350ppm threshold was based on a number of untestable assumptions, uncertainties that cannot be quantified, as well as data from environmental conditions on an ancient Earth, over 2.6 million years ago.

Rockström *et al.* (2009) also critically assumed that current climate models underestimate long-term climate change. The fact that such models have been in use for several decades allows their predictions to be tested against and compared to empirical measurements and quantitative observations of climate parameters such as temperature. For example, Figure 1-04 of the IPCC Fifth Assessment Report (IPCC 2013, https://www.ipcc.ch/report/ar5/) shows that observations of global temperature rise (temperature anomalies) lagged at the bottom end of model predictions. Similarly, published research has shown that that nearly all of the major climate model predictions have consistently *overestimated* global temperatures compared to land-based and satellite observations since their inception 20+ years ago (Cowtan *et al.* 2015, and Fyfe *et al.* 2013). Therefore, the critical assumptions underlying Grisham *et al.* (2016) are untestable and refuted by data.

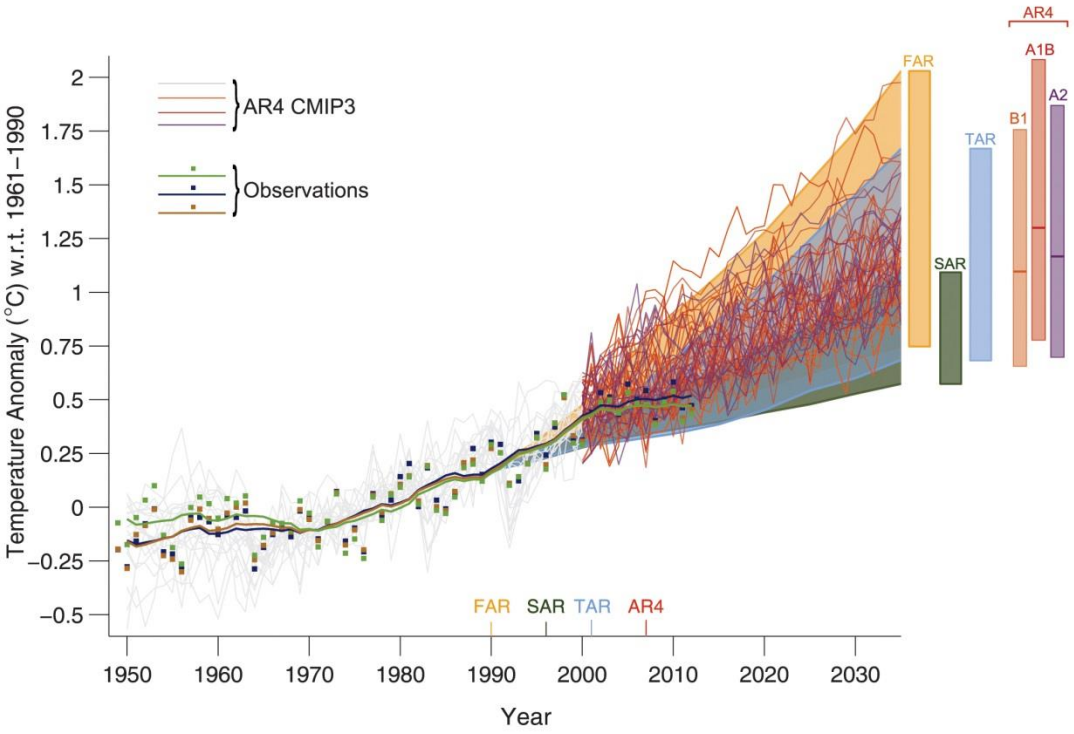


Figure 1-04 from the IPCC Fifth Assessment Report (IPCC 2013, which shows that observations of global temperature rise (temperature anomalies) have lagged at the bottom end of model predictions.

A second component of the Grisham *et al.* (2013) study was to use the results from the analysis of 2001-2011 regional weather and reproductive data for LPCs, and then utilize downscaled future climatic forecasts of temperature and precipitation, 40 and 80 years into the future (for the years 2050 and 2080) to forecast potential changes to LPC reproductive parameters under hypothetical climate change scenarios based on the IPCC's 4th assessment. The climate forecast "data" in this case was actually outputs from model simulations, and therefore, not testable in the career span of most individuals in the field today.

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Cowtan, K., Z. Hausfather, E. Hawkins, P. Jacobs, M.E. Mann, S.K. Miller, B.A. Steinman, M. B. Stolpe, and R.G. Way (2015). Robust comparison of climate models with observations using blended land air and ocean sea surface temperatures. *Geophysical Research Letters*, 42, 6526–6534, doi:10.1002/2015GL064888.

Fyfe, J.C., N.P. Gillett, and F.W. Zwiers. (2013). *Nature Climate Change* 3, 767–769. doi:10.1038/nclimate1972.

Grisham, B.A., A.J. Godar, and C.P. Griffin. (2016). Climate change. Pp. 221–242 *in* D. A. Haukos and C. W. Boal (editors), Ecology and conservation of Lesser Prairie-Chickens. Studies in Avian Biology (no. 48), CRC Press, Boca Raton, FL.

Intergovernmental Panel on Climate Change (IPCC). [online]. 2013. Working group 1 contributions to the IPCC fifth assessment report (AR5), climate change 2013: the physical science basis. <http:// www.climatechange2013.org/images/uploads/ WGIAR5_WGI-12Doc2b_FinalDraft_All.pdf> (15 October 2013).

Rockström *et al.* (2009). A safe operating space for humanity. *Nature* 461, 472-475.

Exhibit D: Literature Cited

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