# Dispersal, habitat use, and eventual settlement of translocated lesser prairie-chickens

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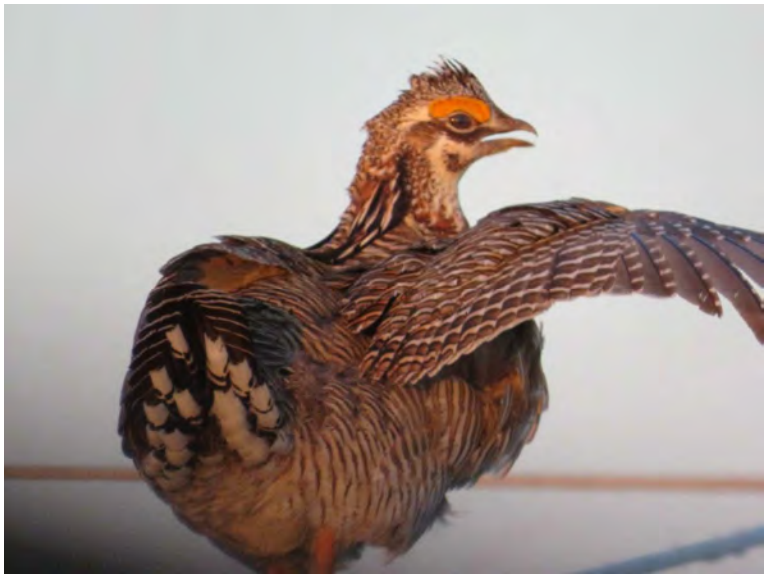
# Bringing back the lesser prairie-chicken

- Population trends are declining in 3 of 4 ecoregions
- Parts of their now unoccupied range (especially in the Sand Sagebrush Ecoregion) are still presumed to have good habitat
- Translocation is a potential option for reintroducing lesser prairie-chickens to these areas

# Translocation in lesser prairie-chickens

- Translocation has mixed success for prairie grouse, which disperse after release

- Lesser prairie-chicken translocation has been attempted at least five times since the 1960s
  - Little monitoring
  - 0 known successes so far



# How do we flip the trend?

- Presumed reasons for failure of past translocations:
  - Low numbers of birds
  - High rates of dispersal (esp. hens)
- Potential solutions:
  - Translocate hundreds of birds over several years
  - **Release hens at sites where they're unlikely to disperse**
    - **Leks**
    - **Nesting habitat**


# Hypothesis 1: Leks will limit dispersal

- Lesser prairie-chickens nest within 3.2 kilometers of a lek, and spend the rest of the year nearby
- If hens use leks as cues to establish their home ranges, then seeing nearby leks may limit their dispersal

- **Potential Solution: Establish leks and release translocated hens nearby**

# Hypothesis 2: Nesting habitat will limit dispersal

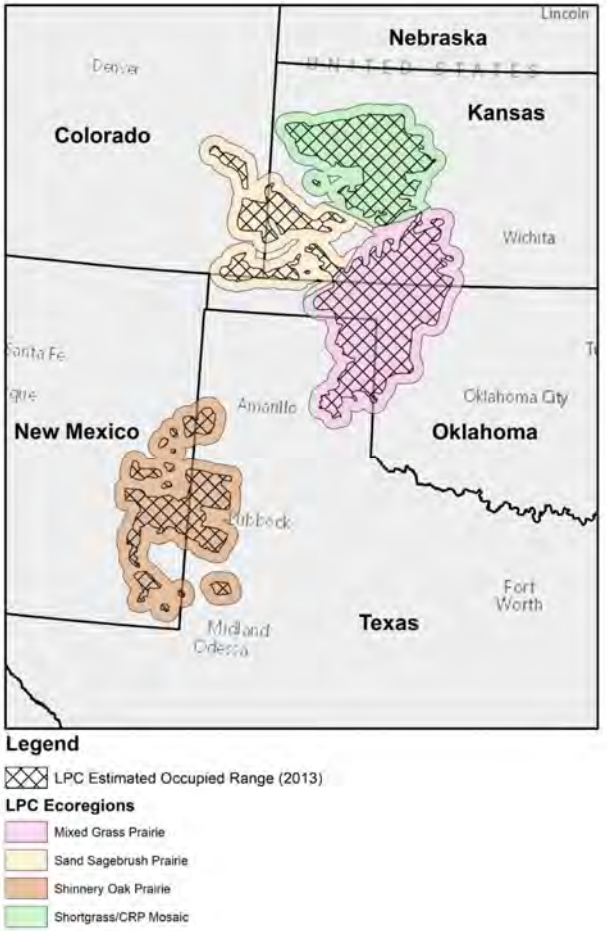
- We capture hens on the lek, and release them right before they're supposed to start nesting
- They may be looking for nesting habitat as they disperse

- **Potential Solution: Release hens at sites immediately adjacent to good nesting habitat**

# Translocating birds to the Sand Sagebrush

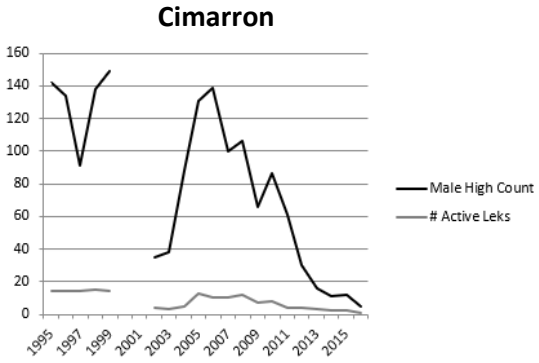
- We tested these hypotheses during the largest lesser prairie-chicken translocation to date

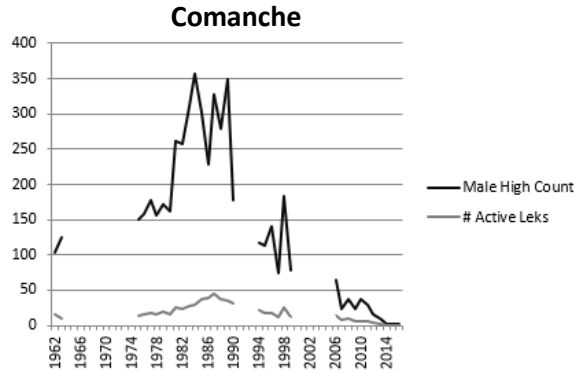
- The Sand Sagebrush Prairie Ecoregion currently has the lowest population, estimated 3000 birds in 2018
  - Nearly extirpated in last decade
  - Reversal from 1980s

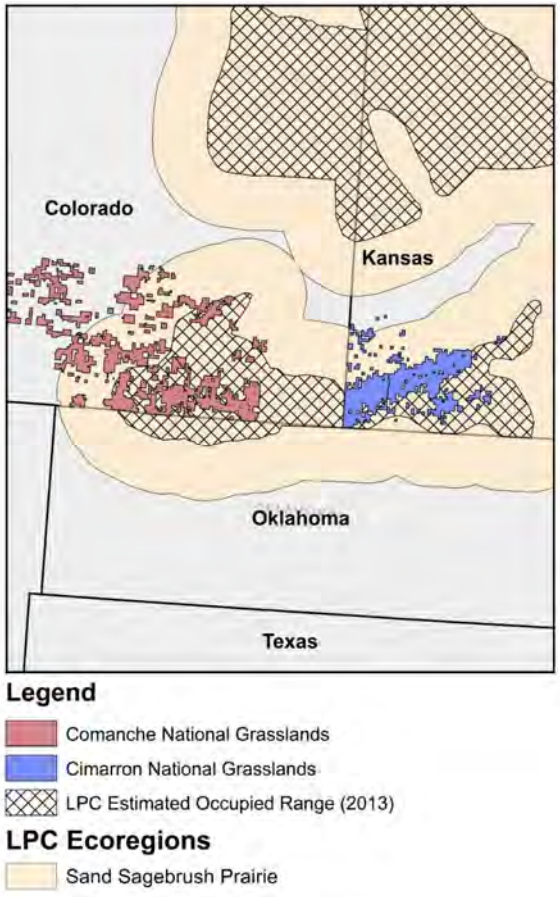


# Cimarron and Comanche National Grasslands

- Largest stretch of public land in the lesser prairie-chicken's range
- Audubon: "best place in the world to see the lesser prairie-chicken"
- Declining since 1980, extirpated by 2016



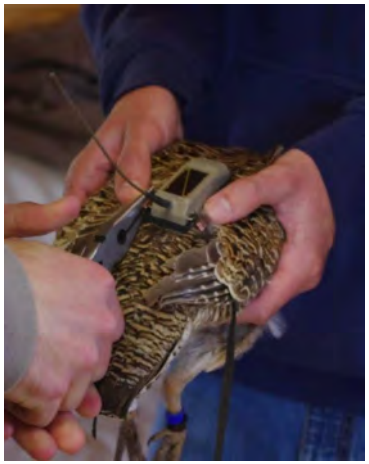



Satellite-only Analysis

# Translocation to the National Grasslands

- VHF Radiotransmitter
  - Tracked by radio triangulation
  - Locations twice a week by technicians, once a month by plane

- SAT-PTT
  - Tracked by GPS, locations uploaded to satellites
  - Locations every 2 hours per individual between 0500 and 2300



# Translocation to the National Grasslands

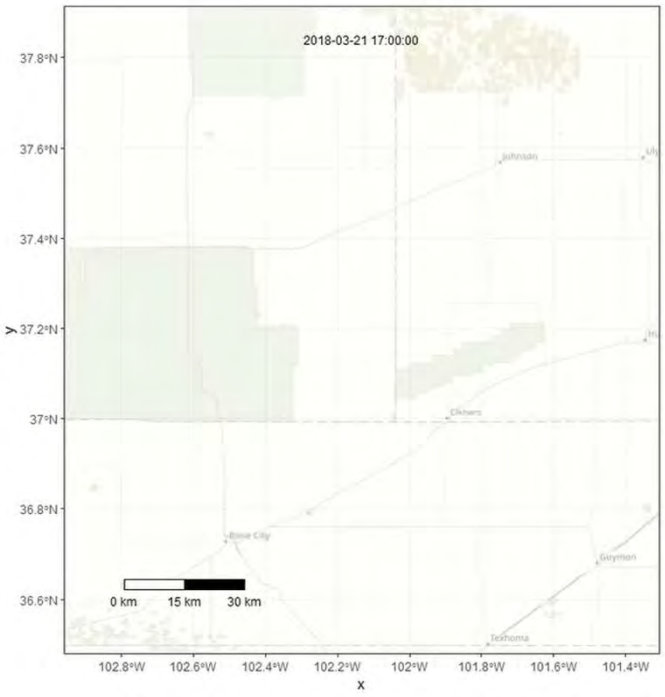
**279 VHF transmitters, 115 satellite transmitters**

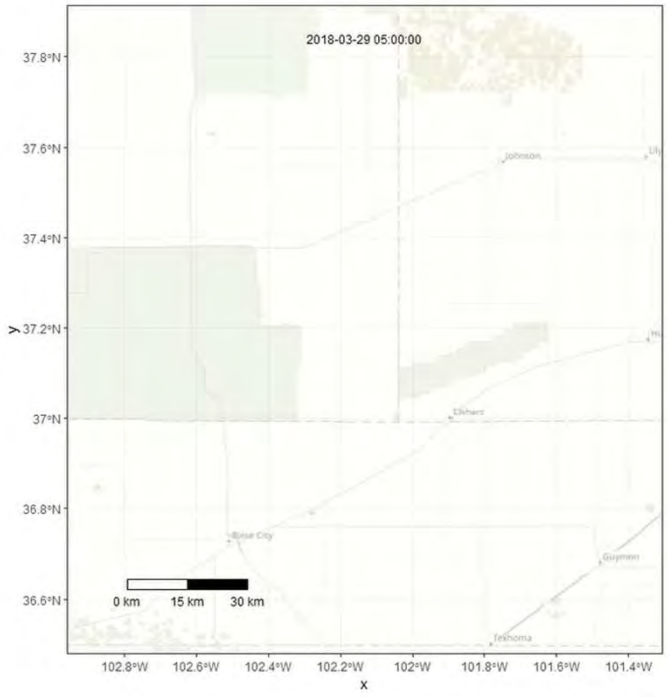
| | Colorado | | Kansas | | |
|---|---|---|---|---|---|
| | Aubrey Trail | Las Vacas Blancas | P3 | L7 | L4 |
| Fall 2016 | 14 (VHF) | | 13 (VHF) | | |
| Spring 2017 | 48 (VHF) | | 35 (VHF) | | |
| Spring 2018 | | 66 (32 VHF, 34 SAT-PTT) | 17 (3 VHF, 14 SAT-PTT) | 51 (29 VHF, 22 SAT-PTT) | |
| Spring 2019 | | 68 (47 VHF, 21 SAT-PTT) | | | 82 (58 VHF, 24 SAT-PTT) |

Active lekking site

High quality nesting site

# Satellites reveal extensive dispersal movements

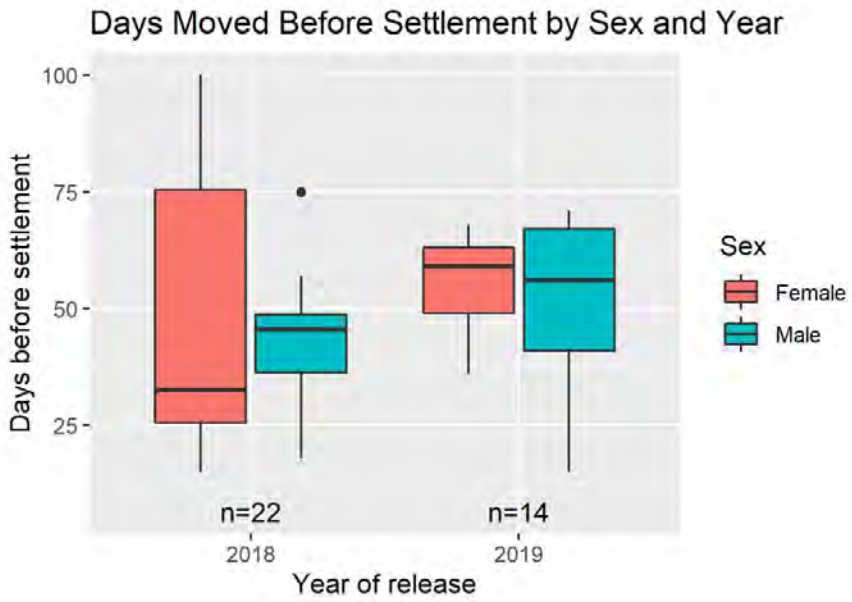


# What happens during these dispersal movements?

Satellite-only Analysis

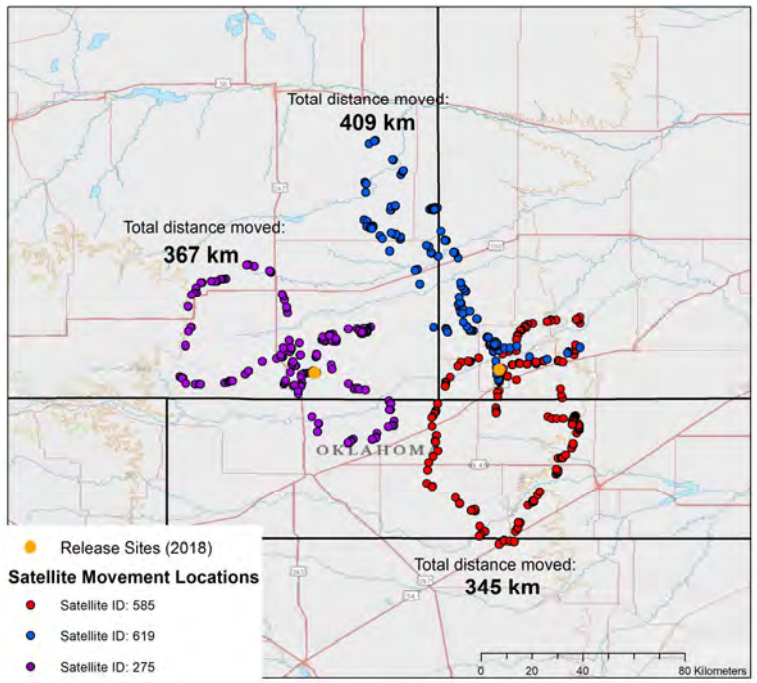
- Mortality during this period is rampant
- 40% true survival through July 31st in 2018, and 34% in 2019
- Birds spent 1-2 months dispersing before settling down

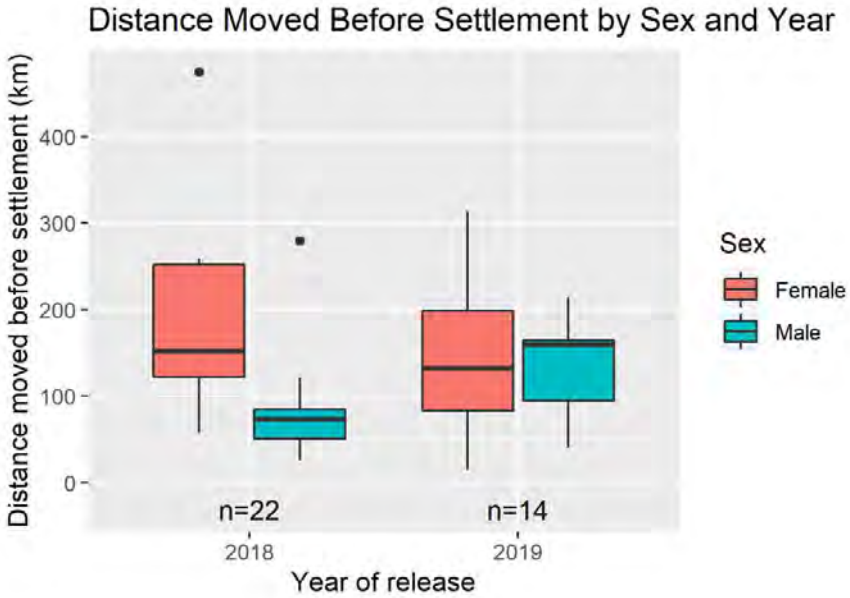


# Distance moved during dispersal

Satellite-only Analysis

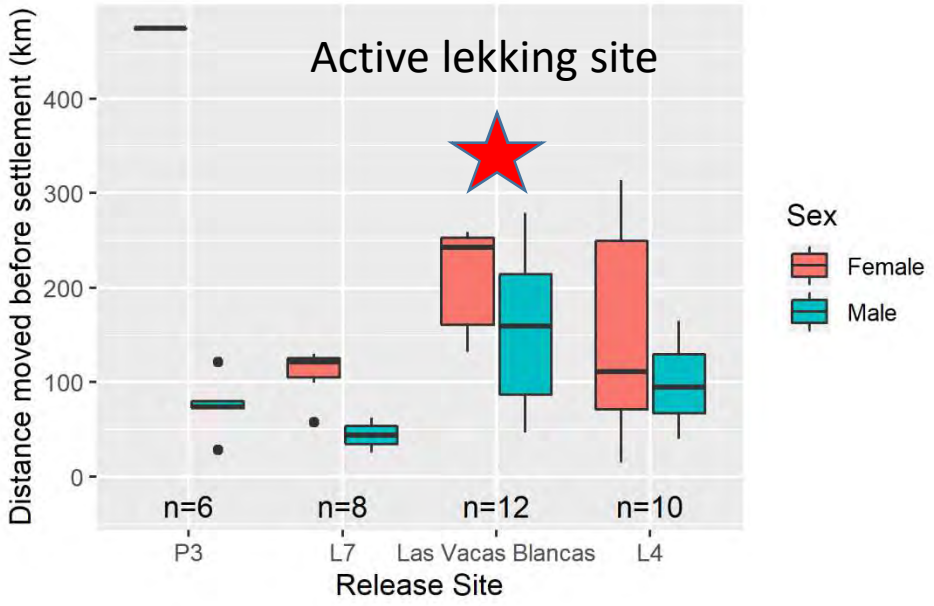
- Movement distances averaged 144 km, with varying differences between sexes
- Certain hens moved much further



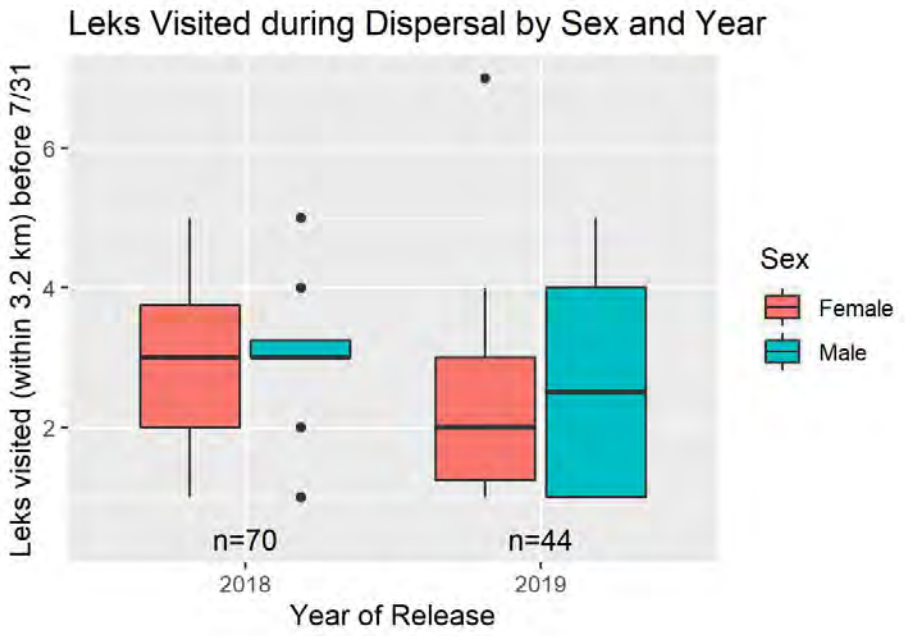
# Were leks moderating hen dispersal?

- Mean distance moved before settlement was over 200 km when hens were released at leks



# Were leks moderating hen dispersal?

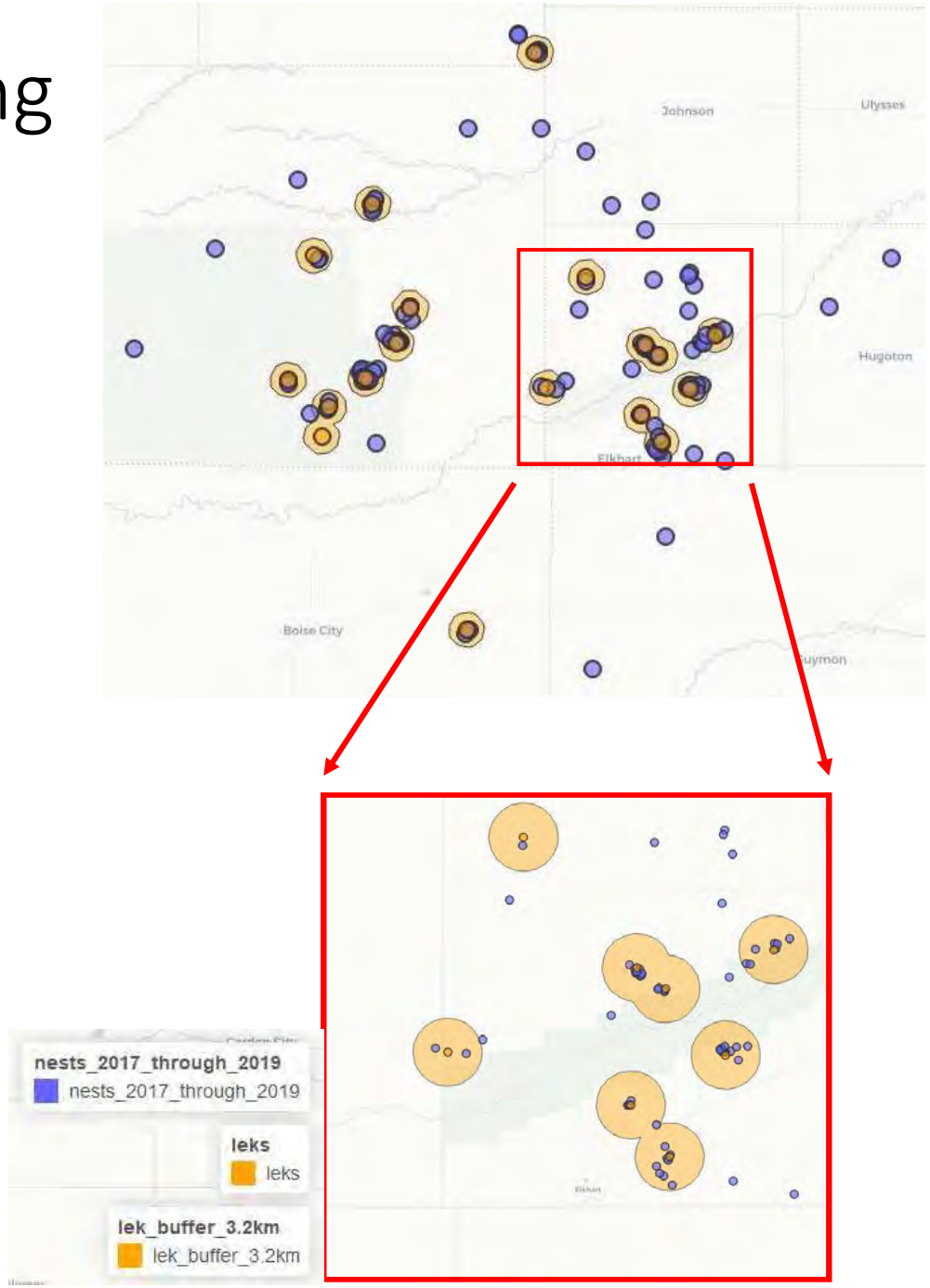
- Females visited numerous leks during dispersal, and then kept going



# Were leks moderating hen dispersal?

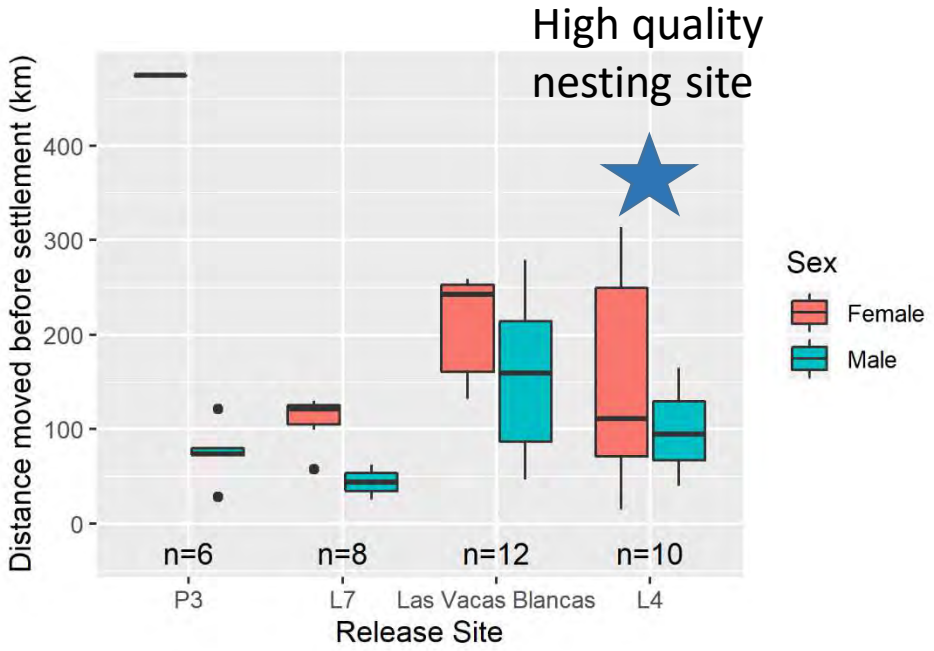
- Hens frequently nested far from lek sites
- Our hens don't seem to use leks as a cue to settle, or to begin nesting

- **Release sites near leks likely won't limit dispersal**



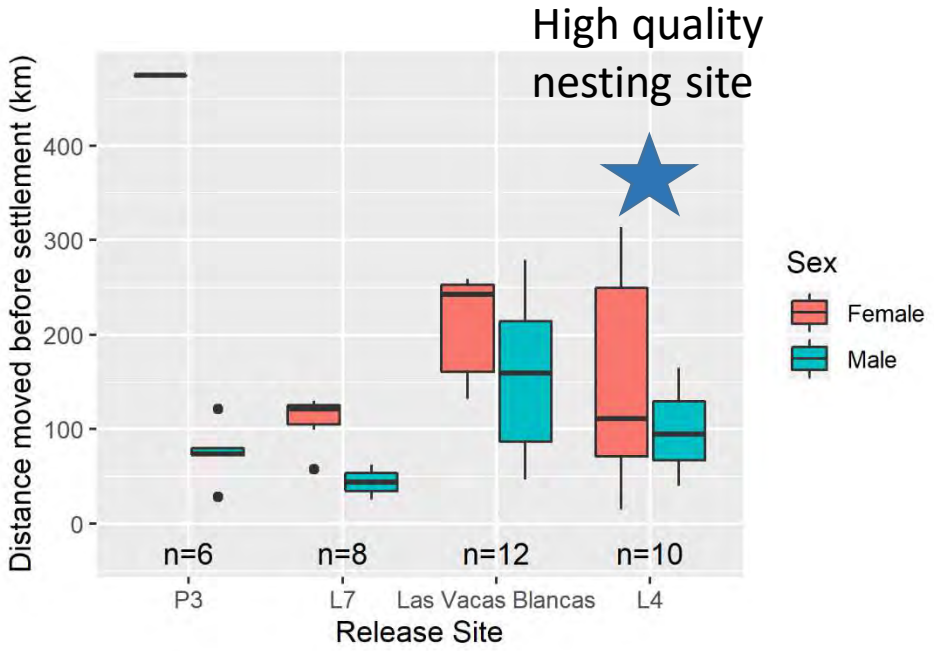
# Was nesting habitat moderating hen dispersal?

- While all of our release sites were adjacent to nesting habitat, only L4 had a large quantity of nests at the site
  - 9 nests within 2 km in 2019

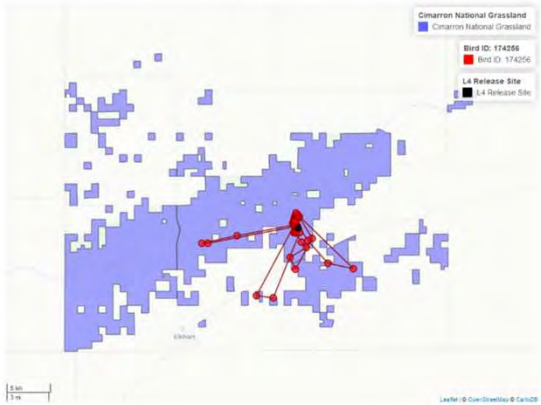


# Was nesting habitat moderating hen dispersal?

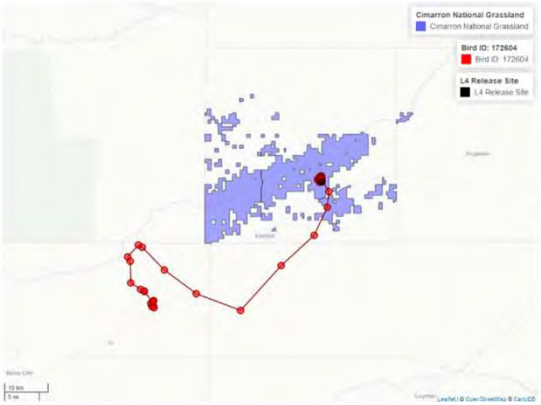
- The average dispersal distance was still over 100 km for hens released at this site

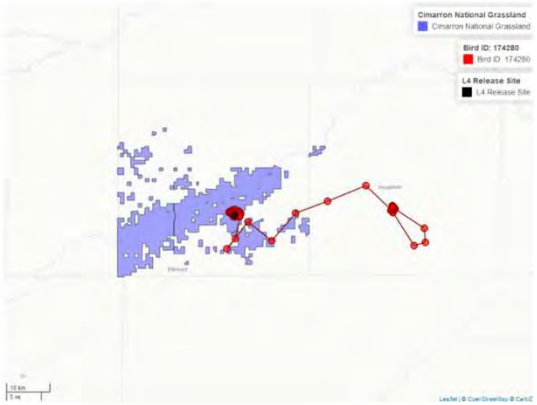


a

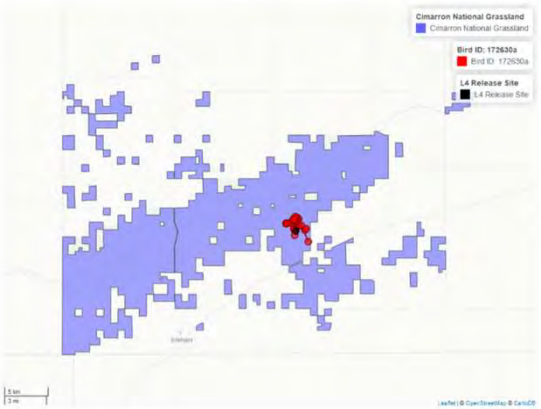

Cimarron National Grassland
Cimarron National Grassland
Bird ID: 174256
Bird ID: 174256
L4 Release Site
L4 Release Site

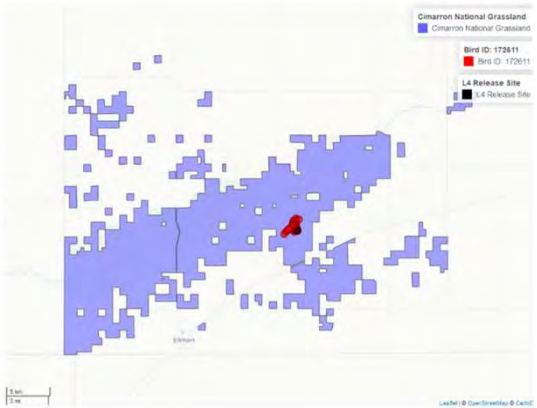
b


Cimarron National Grassland
Cimarron National Grassland
Bird ID: 172604
Bird ID: 172604
L4 Release Site
L4 Release Site


Cimarron National Grassland
Cimarron National Grassland
Bird ID: 174280
Bird ID: 174280
L4 Release Site
L4 Release Site

c


Cimarron National Grassland
Cimarron National Grassland
Bird ID: 172630a
Bird ID: 172630a
L4 Release Site
L4 Release Site


Cimarron National Grassland
Cimarron National Grassland
Bird ID: 172611
Bird ID: 172611
L4 Release Site
L4 Release Site

# Was nesting habitat moderating hen dispersal?

- Even when birds nested at the release site, over half of nesting hens still underwent a dispersal movement

- **Release sites near nesting habitat likely won't limit dispersal**

# Translocation going forward

- Dispersal of translocated hens is going to be a major issue for LPC translocation going forward
  - Resulting mortality
  - Diffusion of surviving birds away from managed habitat
- Release site choice is unlikely to moderate hen dispersal
  - Neither leks nor nesting habitat stopped dispersal movements

# Translocation going forward

- If translocation is going to see more frequent use for lesser prairie-chickens, we'll need to either:
  - Use comparable numbers of birds (> 400)
  - Find alternative methods to address hen dispersal

# Acknowledgments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