

Oklahoma State



WILDLIFE



Division of Agricultural Sciences and Natural Resources
Department of Natural Resource Ecology and Management

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Update on Northern Bobwhite Movement Study

By: Kent Andersson, Sr. Research Specialist



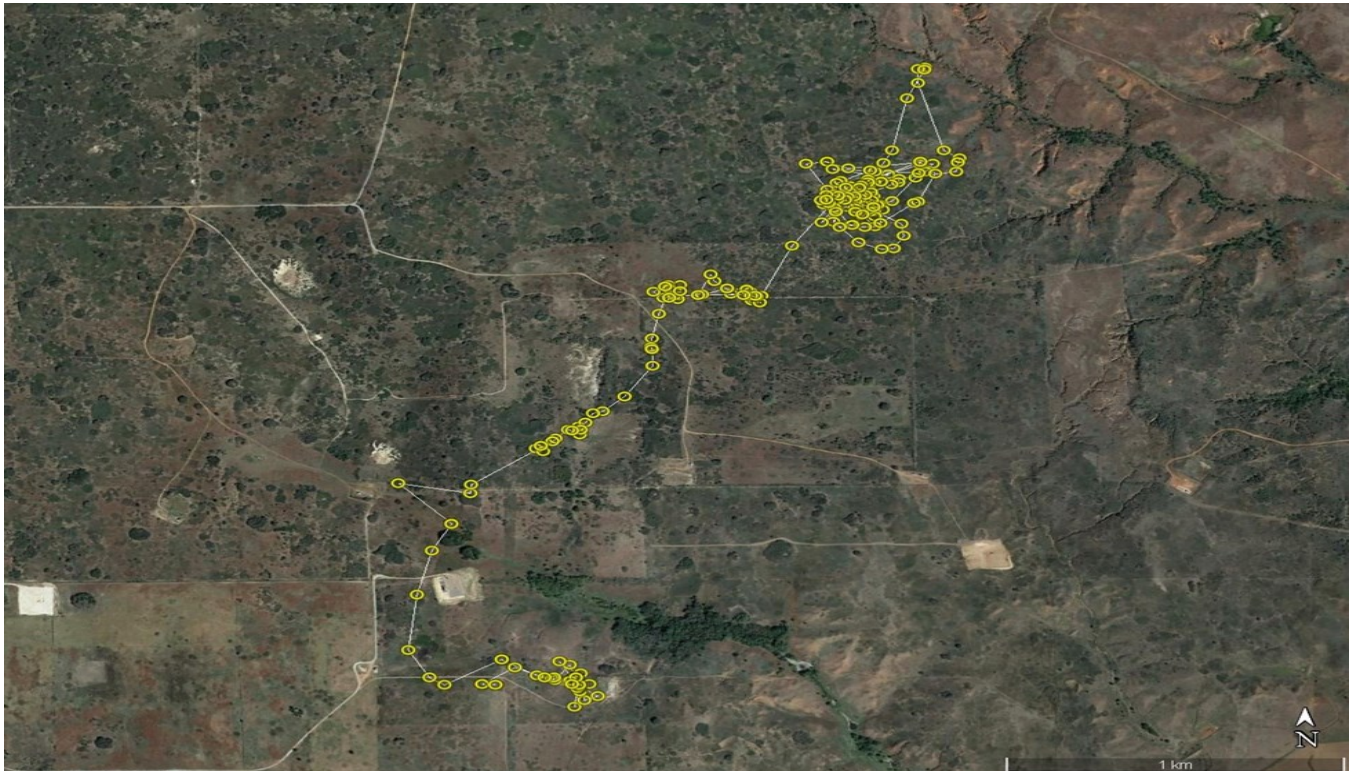
A northern bobwhite male fitted with a GPS transmitter ready for release.

Since the summer of 2018, we have been investigating the movement ecology of northern bobwhites (hereafter, bobwhite) at four different Wildlife Management Areas (Beaver River, Cross Timbers, Packsaddle, and Sandy Sanders) in southern and western Oklahoma. The primary purpose of this collaborative research with Oklahoma Department of Wildlife Conservation is to gather fine-scale movement data to better understand bobwhite habitat use and how their movements relate to woody cover. Additionally, we were interested in examining the seasonal long-distance dispersal movements of bobwhite.

We used solar powered GPS transmitters attached with a backpack-style harness to record up to 18 hourly locations per day, from 5 am to 10 pm. Recorded data were downloaded remotely via satellite link.

The use of GPS transmitters offered specific advantages over traditional radio telemetry. Specifically, we were able to obtain highly accurate locations without disturbing the quail and were able to continuously collect location data as long as the transmitter was active. Such data provided us an opportunity to accurately track daily movements as well as document any long-distance movements by quail.

To date, we have obtained nearly 65,000 locations from GPS transmitters deployed on 341 bobwhites. We recorded 30 long-distance (>1.25 mile) movements, 70% of which occurred during the 3 months of April–June. Our data suggest bobwhite (at least, for our study) did not make many long-distance movements during fall. This result is contrary to some anecdotal evidence that bobwhites in western Oklahoma often move long distances during the fall shuffle. Final analysis of this data is ongoing with publications to follow soon.



An example of a movement track including a long-distance movement by a female bobwhite.

Donor support of research and outreach is welcomed. We are eager to hear from land owners, land managers, and donors regarding research ideas, concerns, and management questions.

To make a donation to the Wildlife Chairs at OSU:

- Go to <http://secure.osugiving.com>, click on the search box.
- Type “wildlife chairs” in the search box.
- When the results appear, choose either “Bollenbach Chair in Wildlife Management” or “Wildlife Conservation Chair” (Groendyke).



Is Coyote Control Warranted?

By: Dwayne Elmore, Bollenbach Endowed Chair in Wildlife Management

Landowners often attempt to control coyote on their property to protect livestock and/or wildlife. Coyote certainly do kill livestock and wildlife. However, before using lethal control, there are several things that landowners should be aware of to prevent frustration, wasting resources, needlessly killing predators, and potentially making the situation worse. First, it is important to understand that coyote form strong pair bonds and maintain defended and established territories. When you kill a territorial coyote, it opens up the territory for other animals to move in and sometimes the density of coyote will actually temporarily increase.

The diet of coyote is diverse and mostly consists of small mammals (especially rodents), insects, scavenged dead animals, and plant material. Scavenging and rodent consumption is probably desired by most landowners. Coyote sometimes kill adult quail or wild turkey, but they also eat opossum, armadillo, raccoon, and other medium sized mammals that are known to eat ground nesting bird eggs such as wild turkey and quail. If managing for these gamebirds, controlling coyotes is not usually in your best interest. Coyote also kill fawn deer. However, if you have too many deer and are having crop damage, removing one of the few predators of deer on your property may exacerbate the issue. Related, hunters wishing to have a healthy deer herd that is at or under the carrying capacity of the land should also consider whether coyote control is helpful. Coyote control would rarely be recommended in Oklahoma for deer management objectives.

There are situations where coyote control is warranted and coyote that are causing agricultural damage can be legally controlled year around in Oklahoma. Sheep, goat, and backyard poultry producers can suffer substantial losses. Also, calves are occasionally killed. Targeting select coyote that are killing livestock can help alleviate damage. Additionally, in areas where deer or pronghorn populations are below desired levels, coyote control may help increase fawn recruitment. This is especially true with pronghorn. Coyote can also be a problem with some garden vegetables such as watermelon.

If you are having damage issues, try to target the specific coyote causing the damage rather than broadscale coyote control. As coyote are territorial, target your control efforts on the area where damage has occurred. Coyote can be called in for shooting with prey distress calls, coyote pup distress calls, or coyote territorial calls depending on the season of the year. Trapping can be highly effective with a #3-4 buried leg hold trap using a scent lure. These can be set at scent posts, coyote trails, fence crossings, or near carcasses.

Trapping coyote is not easy as they are very intelligent. Landowners are encouraged to adequately research how to trap coyote and talk to professional trappers before starting to trap. Not only will this increase chances of success, but will minimize nontarget catch such as your neighbors pet or a skunk (neither of which is fun to deal with!). If you do not have trapping experience, consider hiring a professional trapper (wildlifedepartment.com/law/nwco-operators) or contact USDA Wildlife Services at (405-521-4039).

Coyote are a native species that provide important ecological services. However, they can cause damage in some situations. While targeting specific coyote that are known to be causing damage can reduce problems, random opportunistic shooting is not likely to help anyone and broadscale removal may be counterproductive to land owner objectives. Carefully consider your situation and consult with a wildlife biologist if you need assistance.

Scaled Quail Winter Cover Selection

By: Madison Washburn, MS Graduate Student

Resources required by wildlife change seasonally. Important factors, such as food and cover availability can differ between seasons and influence how a species uses an area. Animal survival can be limited by their ability to forage for food, hide from predators, and regulate their body temperature. As weather conditions change between seasons, wildlife may modify their behavior, particularly during the summer and winter when temperatures are more likely to reach extremes.

Scaled quail populations on the northern edge of their distribution may be especially vulnerable to extreme heat and cold. Shrub cover provides thermal refuge for similar species like northern bobwhite and can help birds moderate their body temperature when they become thermally stressed. Availability of shrub cover may alter scaled quail movements and habitat selection to meet survival requirements.

Managers on the Cimarron National Grassland (CNG) have provided supplemental cover structures, such as brush piles and wooden teepees, to increase cover availability for quail. Little is known about how quail respond to these additional cover features relative to native vegetation.

To learn more about cover selection and how it relates to survival in scaled quail, we attached radio-transmitters to scaled quail on the CNG and have been collecting telemetry locations, vegetation samples, and temperature samples. In addition to the daytime telemetry locations, we are also collecting locations at night to evaluate roost site selection.

We have collected one season of data thus far. Initial data suggest that scaled quail perceive various cover types differently. This means that some types or species of cover may be more important to scaled quail. For example, cholla cactus appears to have high use by scaled quail despite the fact that it is uncommon on our study site. We look forward to gaining a better understanding of how quail survive and use both native and artificial cover during the fall and winter.



Madison Washburn holds a radio-marked scaled quail on the Cimarron National Grassland. Note the cholla cactus, a heavily used cover type during the fall and winter.

Shinnery Oak Shrublands Are Not Just Important for Northern Bobwhite

By: Dr. Craig Davis, Bollenbach Endowed Chair in Wildlife Management

Shinnery oak shrublands are estimated to have once occupied 12-17 million acres across the southwestern United States but have now been significantly reduced due to herbicide and mechanical removal. Because these vegetation communities were historically maintained by frequent fires, fire suppression has played a role in the increase of tree encroachment (e.g. eastern red cedar).

Past research highlighted the importance of shinnery oak shrublands to northern bobwhite. However, a recently completed research project at Packsaddle Wildlife Management Area further highlights the importance of shinnery oak to a wide range of shrubland bird species. We found that at least 77 bird species use shinnery oak shrublands. Common species include dickcissel, field sparrow, lark sparrow, Cassin's sparrow, and painted bunting. The amount of shinnery oak cover and the diversity of vegetation heights across the landscape were important variables that influenced the bird community.

Prescribed fire is an important tool for maintaining these shrublands by preventing encroachment by eastern red cedar, but it also creates the structural variability that is needed to support a diverse bird community. As these shrublands are some of the most imperiled ecosystems in the United States and many of the bird species that inhabit them are threatened with population declines, current conservation efforts should include protection of existing shrublands and re-introduction of fire to these landscapes. Such efforts will not only be beneficial to northern bobwhite, but also to a myriad of other shrubland birds.



Shinnery oak managed with fire and grazing provides the structural variation needed for a diverse bird community.

Wildlife Chairs' 2020 Research and Extension Highlights

2020 Research Publications

Anthony, CR, CA Hagen, KM Dugger, and RD Elmore. 2020. The effects of fire on the thermal environment of sagebrush communities. *Journal of Thermal Biology* 89:doi.org/10.1016/j.jtherbio.2019.102488.

Briske, DD, DL Coppock, AW Illius, and SD Fuhlendorf. 2020. Strategies for global rangeland stewardship: Assessment through the lens of the equilibrium–non-equilibrium debate. *Journal of Applied Ecology* 57:1056-1067.

Butler, A, CA Davis, SD Fuhlendorf, and SM Wilder. 2020. Effects of fire on ground-dwelling arthropods in a shrub-dominated grassland. *Ecology and Evolution* 11:427-442.

Carroll, RL, CA Davis, SD Fuhlendorf, RD Elmore, and JM Carroll. 2020. Orientation affects nest temperature of ground-nesting birds. *Wilson Journal of Ornithology* 132:83 DOI: 10.1676/1559-4491-132.1.83.

Dahlgren, D.K., R.D. Elmore, D.A. (Smith) Woollette, A. Hurt, J.K. Young, D. Kinka, E.B. Arnett, D. Baines, and J.W. Connelly. 2020. Use of dogs in wildlife research and management. Pages 126-144 in N. J. Silvy, editor. *Wildlife techniques manual (8th Edition): research. Volume I.* John Hopkins University Press, Baltimore, Maryland, USA.

Harris, KA, JD Clark, RD Elmore, and CA Harper. 2020. Spatial ecology and resource selection of Eastern box turtles. *Journal of Wildlife Management* 84:1590-1600.

Harris, KA, JD Clark, RD Elmore, and CA Harper. 2020. Direct and indirect effects of fire on Eastern box turtles. *Journal of Wildlife Management* 84:1384-1395.

Kauffman, KL, RD Elmore, CA Davis, SD Fuhlendorf, LE Goodman, CA Hagen, and EP Tanner. 2020. Role of the thermal environment in influencing scaled quail (*Callipepla squamata*) nest site selection and survival. *Journal of Thermal Biology* 95:102791 DOI: [10.1016/j.jtherbio.2020.102791](https://doi.org/10.1016/j.jtherbio.2020.102791).

Londe, DW, RD Elmore, CA Davis, SD Fuhlendorf, B Luttbeg, and TJ Hovick. 2020. Structural and compositional heterogeneity influences the thermal environment across multiple scales. *Ecosphere* 11:e03290. [10.1002/ecs2.3290](https://doi.org/10.1002/ecs2.3290).

Peterson, JM, JE Earl, SD Fuhlendorf, RD Elmore, DA Haukos, AM Tanner, and SA Carleton. 2020. Estimating response distances of lesser prairie-chickens to anthropogenic features during long-distance movements. *Ecosphere* 9:e03202.

Polo, JA, EP Tanner, R Scholtz, SD Fuhlendorf, JT Ripberger, CL Silva, HC Jenkins-Smith, and N Carlson. 2020. Mismatches in prescribed fire awareness and implementation in Oklahoma, USA. *Rangelands* 42:196-202.

Rischette, AC, TJ Hovick, RD Elmore, BA Geaumont. 2020. Use of small unmanned aerial systems for sharp-tailed grouse lek surveys. *Wildlife Biology* doi.org/10.2981/wlb.00679.

Sanderson, JS, C Beutler, JR Brown, I Burke, T Chapman, RT Conant, JD Derner, M Easter, SD Fuhlendorf, G Grissom, JE Herrick, D Liptzin, JA Morgan, R Murph, C Pague, I Rangwala, D Ray, R Rondeau, T Schulz, and T Sullivan. 2020. Cattle, conservation, and carbon in the western Great Plains. *Journal of Soil and Water Conservation* 75:5-12.

Sharma, S., JD Carlson, ES Krueger, DM Engle, D Twidwell, SD Fuhlendorf, A Patrignani, L Feng, and TE Ochsner. 2020. Soil moisture as an indicator of growing-season herbaceous fuel moisture and curing rate in grasslands. *International Journal of Wildland Fire* doi.org/10.1071/WF19193.

Starns, HD, SD Fuhlendorf, RD Elmore, D Twidwell, ET Thacker, TJ Hovick, and B Luttbeg. 2020. Effects of pyric herbivory on prairie-chicken (*Tympanuchus* spp) habitat. *Plos one* 6:e0234983.

Tanner, AM, EP Tanner, M Papes, SD Fuhlendorf, RD Elmore, and CA Davis. 2020. Using aerial surveys and citizen science to model habitat suitability for an imperiled grouse. *Biodiversity and Conservation* doi:10.1007/s10531-019-01921-6.

2020 Extension Publications

Elmore, R.D. 2020. Tips for managing nuisance armadillo. Oklahoma Cooperative Extension Service. NREM 9029.

Elmore, R.D., R. Stevens, and J. Shaw. 2020. Managing deer damage to crop fields in Oklahoma. NREM 9031.

Londe, D., R.D. Elmore, and J. Rutledge. 2020. Greater prairie-chicken reproductive failure following extreme precipitation events. *Grouse News* 59:12-15.

2020 Extension Activity Highlights

19 presentations at professional and landowner meetings

6 field days and workshops

Filmed 15 TV segments on wildlife and land management

Provided over 75 hours of direct technical assistance to land managers

Produced monthly wildlife management articles for county extension educators

Oklahoma State University Wildlife Chairs

Craig Davis holds the Bollenbach Endowed Chair in Wildlife Management with both research and teaching responsibilities. He can be contacted at craig.a.davis@okstate.edu or 405-744-6859.

Dwayne Elmore holds the Bollenbach Endowed Chair in Wildlife Management with a focus on extension and research. He can be contacted at dwayne.elmore@okstate.edu or 405-744-9636.

Samuel Fuhlendorf is a Regents Professor and holds the Groendyke Endowed Chair in Wildlife Conservation. He can be contacted at sam.fuhlendorf@okstate.edu or 405-744-9646.