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## SAGE-GROUSE LEKS - ALTHOUGH WE COUNT THE MALES EACH SPRING, IT IS REALLY ALL ABOUT THE FEMALES AND THE WEATHER

By Terry Messmer, Utah State University

The Utah Greater Sage-grouse Conservation Plan (Plan) has established bold annual population and habitat objectives that are being used to track sage-grouse conservation. The Plan proposes to sustain an average male lek count of 4,100 males (based on a 10-year rolling average on a minimum of 200 monitored leks) and increase the population of males to an average of 5,000 (based on the same 10-year rolling average on a minimum of 200 monitored leks) within the established sage-grouse management areas (SGMA).

Leks are the center of breeding activity for sage-grouse. Male sage-grouse begin to congregate on leks in late February/early March and



perform a ritualized courtship display. Courtship displays are linked to pre and early dawn hours and quickly wane within a couple of hours following sunrise. Females are attracted to leks by the male courtship displays and mating is thought to primarily occur on the lek. Lek attendance may continue as late as early June, but typically peaks during April in Utah.

*Male sage-grouse gather in the spring at leks to initiate the age-old breeding cycle. Sometimes leks can be found in some strange place like highways. The Henefer Lek is a well known Greater Sage-grouse Lek on the Morgan and Summit County line. The lek site has historically been right on SR-65. Photo courtesy of Brandon Flack.*

As sage-grouse populations decline, the number of males attending leks may decline or the use of some leks may be discontinued. Likewise, as populations increase, male attendance may increase and/or new leks may be established or old leks reoccupied. Thus, male lek counts have been widely used as an index for sage-grouse population change, to guide management decisions, and estimate the breeding population size.

However, the validity of using lek counts for monitoring changes in population numbers in response to management actions was suspect. This also put into questions the validity of the Utah's Plan in using male-based leks counts to track state management efforts.

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In 2016, Dr. Dave Dahlgren and his colleagues, put that question to the test. They evaluated, using standard lek count protocols which followed range-wide guidelines, to determine if they reflected change in population growth. Using data collected over a 12-year period from sage-grouse populations on the Parker SGMA, they validated that male-based leks counts of sage-grouse can be used to detect overall population change. And, male-based lek counts tracked female sage-grouse reproductive success.

Other Utah State University scientists (Caudill et al. 2016) evaluated the effects of climatic variation and reproductive trade-offs on multiple sage-grouse reproductive vital rates. Based on over a decade of field observations obtained from 1998-2010 for sage-grouse inhabiting the Parker Mountain SGMA, they hypothesized that reproduction was influenced by previous reproductive success.

They found that neither nest initiation nor clutch size were affected by climatic variables or previous reproductive success. However, they did find that both nest and brood success were affected by climatic variation and previous reproductive success. Nest success was highest in years with high spring snowpack, and was negatively related to previous brood success. Brood success was positively influenced by moisture in April, negatively associated with previous nest success, and positively influenced by previous brood success. These results support the Utah Plan objectives of increasing the sage-grouse habitat base. The creation of a larger habitat base to grow more green groceries will increase the potential for increased production and recruitment in years when climatic conditions are favorable. Based on the snow pack this year and the 500,000 acres of habitat enhanced by the Utah Plan partners, we should see good sage-grouse production throughout Utah in 2017.

To read more about this groundbreaking research click on the links provided below.

Caudill, D. M. R. Guttery, E. Leone, G. Caudill, and T. A. Messmer. 2016. Age dependence and individual heterogeneity in reproductive success of greater sage-grouse. *Journal of Avian Biology*.

[http://www.utahcbcp.org/files/uploads/publications/Caudill\\_etal\\_2016\\_agedependence.pdf](http://www.utahcbcp.org/files/uploads/publications/Caudill_etal_2016_agedependence.pdf)

Dahlgren, D.K., M.R. Guttery, T.A. Messmer, D. Caudill, R.D. Elmore, R. Chi, and D.N. Koons. 2016. Warranted but Precluded: Evaluating Vital-Rate Contributions to Greater Sage-Grouse Population Dynamics to Inform Conservation. *Ecosphere*.

<http://utahcbcp.org/files/uploads/publications/DahlgrenEtAl2016Ecosphere.pdf>

Caudill, D, M. Theron, B. Bibles, and T. A. Messmer. 2016. Factors affecting seasonal movements of juvenile Great Sage-grouse: A reconceptualized nest survival model. *Condor*.118:139-147.

[http://www.utahcbcp.org/files/uploads/publications/Caudill\\_etal\\_2016\\_Condorjuvenile.pdf](http://www.utahcbcp.org/files/uploads/publications/Caudill_etal_2016_Condorjuvenile.pdf)



*Utah's Plan is all about providing secure nesting and brood-rearing habitats for female sage-grouse. It is the availability of this habitat for female sage-grouse that really determines the location of the leks.*

*Photo courtesy of Todd Black.*



*Radio-telemetry is critical to determining and defining greater sage-grouse seasonal habitat needs. Here in the forefront, is a female sage-grouse that has been fitted with a necklace-style radio transmitter, basking in the late winter sun.*

*Photo courtesy of Todd Black.*

# IT'S OFFICIAL - CLEARING CONIFERS CONSERVES SAGE-GROUSE

By Shelby Ruud, USU

Conifer encroachment has been identified as a major threat to the conservation of the greater sage-grouse. As much as 60,000 acres of sagebrush habitat are estimated to be annually impacted. However, research published by Utah State University Extension specialists shows that the removal of invading conifer trees from sagebrush habitats could help boost success for nesting and brooding sage grouse.

“Removing trees goes against what we typically think is good for the environment,” said Terry Messmer, USU Extension wildlife specialist. “But this study scientifically validates this practice as a sage-grouse conservation strategy in areas where junipers have encroached into sage-grouse habitat.”



According to the research, the encroachment of conifers into sagebrush habitats is one of several major causes of sage-grouse declines. As trees spread into the sagebrush, predation may increase because the trees provide new nest sites and perches to birds of prey. Conifers also alter sagebrush habitats by robbing the plants of water and nutrients from the soil.

“Sage-grouse are considered the umbrella species for 350 other species that depend on the sagebrush ecosystem for their survival. Conservation actions that benefit sage-grouse, also may benefit these species and ensure the viability of these species and the other environmental services provided by sagebrush watersheds,” Messmer said.

To conduct the study, researchers radio-marked 96 female sage-grouse in northwestern Utah and followed them and their chicks over a 4 year period. Females that nested and raised their chicks in areas cleared of conifers were more likely to successfully nest and fledge their chicks.

“The speed at which these space-starved birds colonize our sagebrush restorations is remarkable, and their increased performance is the ultimate outcome in science-based conservation,” said Charles Sandford, former USU graduate student researcher.



Charles Sandford

Utah leads the rest of the western states in removing conifers that have encroached into sage-grouse habitat. To date the Utah partners have removed over 500,000 acres since 1997.

*Photos above courtesy of Charles Sandford.*

This study published in the Journal of Rangeland Management & Ecology is available on-line at <http://www.sciencedirect.com/science/article/pii/S1550742416300835>. More information about sage-grouse restoration can be found at [www.utahcbcp.org](http://www.utahcbcp.org).



*Photo courtesy of Brandon Flack.*

## Public Notice

### Utah Sage-grouse Compensatory Mitigation Program

The public comment period for the Utah Sage-grouse Compensatory Mitigation Program opened on April 15th. The rule can be accessed at [https://rules.utah.gov/publicat/bull\\_pdf/2017/b20170415.pdf](https://rules.utah.gov/publicat/bull_pdf/2017/b20170415.pdf). The sage-grouse section is on pages 41-48 of the pdf (internal document page numbers 35-42). Comments should be submitted in writing to [kaelynanfinsen@utah.gov](mailto:kaelynanfinsen@utah.gov) by May 15th, 2017.

***If it's not good for communities, it's not good for wildlife.***

## HELPING SAGE-GROUSE THROUGH ENERGY CONSERVATION

By Lorien Belton

Climate change models are forecasting changes that will affect a lot of things about the way we live in the West, including things that matter to sage-grouse. How exactly a changing climate might impact sage-grouse will depend on many factors, but we already know that droughts are bad news for sage-grouse. One of the studies reported on in this newsletter suggests a strong tie between precipitation – particularly snowpack levels – and sage-grouse production. Some climate models predict that more of our precipitation in the future may come as rain and not snowfall. What exactly that means for sage-grouse is uncertain, but changes to the timing of spring moisture, and where water is available – or not – late into the summer, are important factors in how sage-grouse may be affected.

Regardless of whether you agree that climate change is being caused by our human activities or not, there are still things we can all do to contribute to sage-grouse conservation by energy conservation. One of the realities of life in the West is that we have to drive vehicles to get where we want to go. There are no teleporters yet, so if we want to visit a sage-grouse lek, see a nest location, or find out why a bird died in the field, we have to drive something powered by fossil fuels.

Thankfully, though, technology has started to give us some reasonable alternatives to driving a full-size truck to every remote, rugged sage-grouse location: GPS collars. In the past, every sage-grouse wearing a radio-collar had to be tracked down in person, usually by someone driving slowly along two-track roads listening carefully for the beep of a radio signal to alert them that the grouse was near. Now, although it's more expensive up front, GPS (global positioning system) collars allow researchers to track sage-grouse using satellite technology. The collars upload data on bird locations multiple times a day, without needing a person to physically locate it each time. This makes visits to the field much more efficient, and lets researchers know where the grouse go, even to places we would never have guessed.

In addition to new technologies, our lab now uses ATVs instead of trucks, where feasible, to save dollars and reduce the amount of fuel burned. Just as motorcycles are more fuel-efficient than cars, ATVs can cover a lot of ground (and do less damage to vegetation) in areas where finding sage-grouse takes researchers off regular roads. It also keeps costs down – with one truck full of technicians with ATVs, more ground can be covered each day with lower costs than bringing several full trucks.

And then there's just old-fashioned sharing – carpooling. Getting to the field, or even to those endless meetings where a lot of data discussion and policy coordination happens. That uses gasoline too. In our lab, we've worked to combine trips when possible, sharing rides as we traverse Utah's highways on our way to meetings, conferences, and field tours. Not only does it save gas and money, but it promotes our big-picture goal of working together. There's nothing like the time on a long car ride to get to know someone's work, learn something about them personally, and make connections that bring new ideas and new partnerships into being.

So thinking about our energy efficiency and our carbon footprint is related to a lot of other

benefits we strive for as well: expanding technology use, improving relationships, saving money, reducing our contribution to Utah's air quality problems, and hopefully doing our small part to reduce our climate impact, for the benefit of all of us, including sage-grouse.



*We regularly use ATVs to reduce our energy consumption in our field work. Photo courtesy of Charles Sandford.*

### Utah's Community-Based Conservation Program Mission

Utah's Community-Based Conservation Program is dedicated to promoting natural resource management education and facilitating cooperation between local communities and natural resource management organizations and agencies.

Utah State University is committed to providing an environment free from harassment and other forms of illegal discrimination based on race, color, religion, sex, national origin, age (40 and older), disability, and veteran's status. USU's policy also prohibits discrimination on the basis of sexual orientation in employment and academic related practices and decisions.

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