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Sage-grouse Lek Counts – What Do They Really Mean?

By Terry Messmer, Utah State University

Obtaining valid population estimates or trends are essential to understanding the effects of management and conservation strategies on population trajectories. For greater sage-grouse (*Centrocercus urophasianus*) the gold standard to track sage-grouse populations trends has been annual counts of males on leks.

Watch the sage-grouse males strut at a lek in early spring. Click on the video at http://utahcbcp.org/presentations/ Video courtesy of Todd Black.

Leks are the center of breeding activity for sage-grouse. Male sage-grouse begin to congregate on leks in late February or early March and perform a ritualized courtship display. Courtship displays are strongly correlated 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 primarily occurs on the lek. Lek attendance may continue as late as early June, but typically peaks during April in Utah.

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. There is little evidence that suggests lek habitat is limiting. Additional lek habitat can be created if needed, but does not guarantee that sage-grouse males will utilize the created lek habitat.

Lek counts have been widely used as an index for sage-grouse population change and to guide management decisions. Counts of male sage-grouse attending leks during the breeding season have also been used to estimate the breeding population size by assuming a detection probability and sex ratio. In the latter case, managers often assume a 2:1 female biased ratio. However, this sex ratio has not been validated and may result in biased population estimates. The Utah Division of Wildlife Resources (UDWR) has assumed a 75% detection rate for male sage-grouse on leks and a 2:1 female biased sex ratio.

Utah 2019 Greater Sage-grouse Leks Counts – What do they mean?

Utah Division of Wildlife Resources biologists and their partners have completed the 2019 lek counts. Ideally, the biologists try to count all leks

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In This Issue

Heather Talley Appointed as the New Upland Game Coordinator

Earlier this year, Jason Robinson transferred to a new position within the Utah Division of Wildlife Resourses (UDWR) and is no longer the Upland Game Coordinator. Jason has worked on sage-grouse issues for many years. We wish him and his family well in their transfer. This summer UDWR announced that Heather Talley will replace Jason as the new Upland Game Coordinator. She will also be assuming some sage-grouse coordinator duties from Ben Nadolski.

Heather Talley has lived in southern Utah most of her life, graduating from Southern Utah University with Biology and Agriculture degrees. Heather began working for UDWR in 2008 as the depredation specialist. She subsequently administered the Walk-In Access and the Wildlife Recreation programs before accepting the Upland Game Coordinator position. Throughout her 10-year career at the UDWR, she has worked with multiple entities to improve habitat via beaver translocations, hosted a plethora of events — including youth pheasant hunts and turkey clinics — and enrolled several privately owned properties into the Walk-In Access program to expand opportunities for the public to hunt and/or fish. Heather has embraced her new role with the passion you might expect from a life-long wildlife enthusiast. "I am excited about the new challenges and opportunities involved with this position. We still have so much to learn about upland game species, and being immersed in the research and new ideas that research foments is fascinating."

Photos courtesy of Heather Talley.

Sage-grouse Local Working Groups: Keeping up to Date with It All

By Lorien Belton, Utah State University

We're just beginning the fall round of Utah's Community-based Conservation Program (CBCP) sage-grouse local working group (LWG) meetings. There are a lot of topics on our agendas! Many of them are moving targets, but that's part of the role of the LWGs: keeping us all up to speed about where different long-term processes are at any given moment. In that realm, some of the topics we'll be discussing in fall meetings will include:

- Status of ongoing efforts to improve the maps we use for sage-grouse habitats,
- Potential impacts of the court injunction from Oct 16 related to the implementation of the Bureau of Land Management's plan amendments (which were finalized this spring),
- Status of the Forest Service plan amendments process (which is nearing completion), and
- Predator management programs in key areas

Those items affect all the working groups as well as the policies and tools we work with.

There's plenty of other in-progress work on the regional and local scale as well. For example, in the West Desert group (WDARM) we'll be sharing updates, lessons learned, and ideas for moving forward on several research projects, including:

- A hydrology study – run by the Utah Geological Survey – examining the impact of pinyon-juniper removal on ground water availability and flows
- A sage-grouse population and translocation study conducted by USU, now in its fourth year
- A Utah State University study looking at dispersed recreation usage in the Sheeprocks area
- Outside research findings – beyond what group members are working on – that help inform our decisions and management strategies.

On top of all that, the working group meetings are a key time to share project ideas and challenges, and get feedback from the diverse group of minds in the room. Finally, our working groups provide the chance to visit those projects on the ground. Out in the West Desert, our next trip will be to Ibapah, on the Nevada/Utah border, to visit projects for fire prevention, sage-grouse habitat, and other habitat improvement work. Utah's sage-grouse local working groups provide a way to connect and share information on many topics. To see upcoming scheduled meetings, visit our website at www.utahcbcp.org.

at least three times between March 20 and May 7. The highest number of male counts is used to establish populations trends.

The 2019 male sage-grouse lek count data has been summarized. In 2019, biologists visited 305 leks in Utah's Sage-grouse Management Areas (SGMAs; Figure 1). Biologists counted 2,094 males on 184 leks. This count is 41% down from 2018 (Figure 2).

Because Utah's sage-grouse populations tend to cycle between high and low counts every 9-12 years, UDWR biologists expected that the 2019 lek counts would be down as we approach the bottom of the cycle period (Figure 3). These trends were consistent for all SGMAs.

The 2019 Utah lek counting effort was further impeded by limited access to known leks. Persistent snowpack and late season storms limited biologist access to leks and both delayed and truncated sage-grouse lek attendance. Thus, when biologists were able to access lek sites, they missed peak attendance. These observations and problems have been consistently reported range wide.

Researchers at Utah State University previously evaluated the validity of using lek-counts to estimate populations in Utah. They concluded that the standard UDWR counts which are used to monitor most sage-grouse leks may omit, on average, two males per count. Additionally,

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Figure 1. Utah Sage-grouse Management Areas where sage-grouse leks were counted in 2019. Map from the Utah Division of Wildlife Resources.

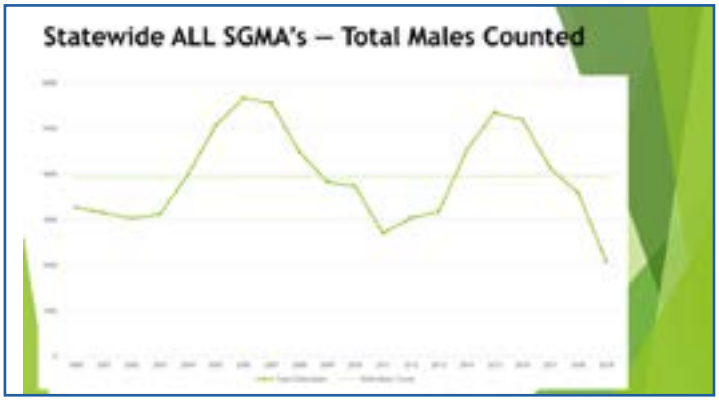

Figure 2. Biologists counted 2094 males on 184 leks on Utah Sage-grouse Management Areas in 2019. This is 41% lower than the number of males counted in 2018. Graph from the Utah Division of Wildlife Resources.

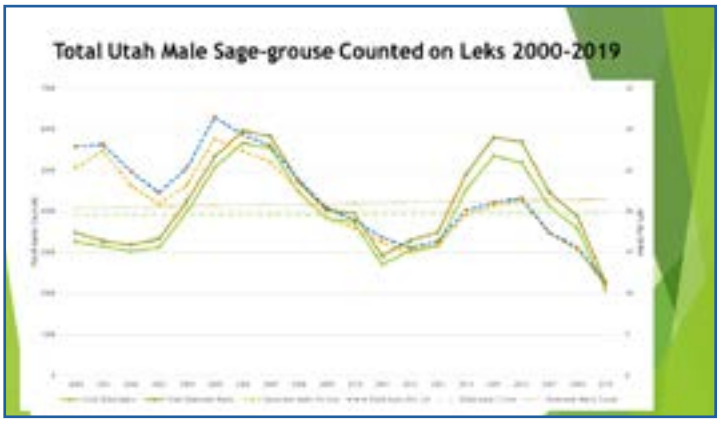

Figure 3. Utah sage-grouse populations tend to fluctuate between high and low counts every 9-12 years. Thus, biologist expected that the 2019 lek counts would be down as we approach the bottom of the cycle period. Graph from the Utah Division of Wildlife Resources.

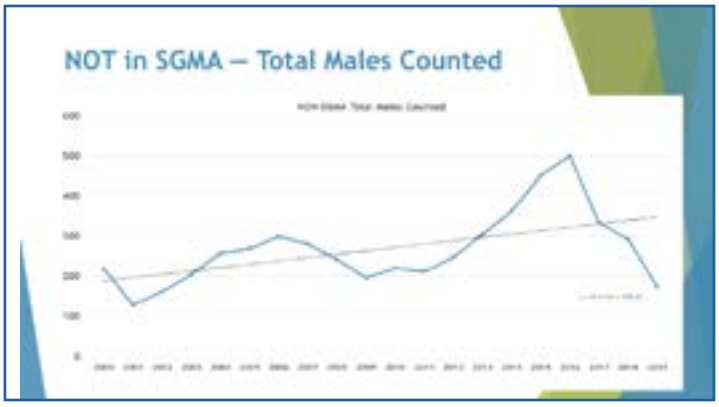

Figure 4. The number of greater sage-grouse males counted on leks not within Utah's Sage-grouse management areas followed state-wide patterns. Graph from the Utah Division of Wildlife Resources.

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

Sage-grouse Leks Counts – What Do They Really Mean? cont.

they found that only 56% of all available males were actually attending leks at any given time. Their results demonstrated that male lek attendance rates fluctuate throughout the breeding season, but typically peaked at or before sunrise. As such, they recommended that lek counts should be conducted as early as possible to obtain the most accurate counts. This may result in fewer leks being counted per morning but will provide more representative data.

So, what does this mean for the future?

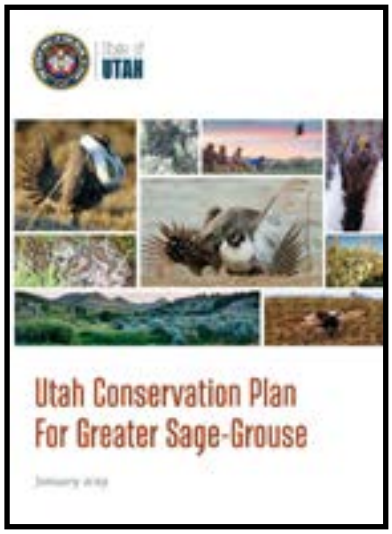
The validity of lek counts for monitoring changes in population numbers remains suspect. Their utility as a measure of population production has never been evaluated. Researchers at Utah State University also evaluated using standard lek count protocols which followed range wide guidelines to determine if they reflected lambda or change in population stability They concluded that male-based leks counts of sage-grouse **can be** an effective index to overall population change. These results provide a basis for states to track sage-grouse population responses to management and conservation actions.

Utah leads the nation in the number of habitat projects that have been implemented to benefit sage-grouse. The Utah Plan emphasizes increasing usable space for sage-grouse in naturally fragmented habitat as a means of increasing both production and connectivity. The reduction and removal of juniper (*Juniperus* spp.) and pinyon pine (*Pinus edulis*; PJ) encroachment in SGMAs where the sagebrush and herbaceous understory is relatively intact has been documented to directly benefit sage-grouse production.

Research completed by Utah State University has confirmed that sage-grouse will use areas within SGMAs where PJ has been removed within a short period of time (< 1 to 3 years) post-treatment, especially if the treatment site has sagebrush remaining in the understory, mesic areas nearby, and the site is near existing sage-grouse use areas. This research has also documented increased sage-grouse nest and brood success in the treatment areas.

Although, Utah has enhanced over 500,000 acres of sagebrush habitat for sage-grouse, weather still plays a large role in sage-grouse production. Sage-grouse nest success has been highest in years with high spring snowpack. Sage-grouse brood success is positively influenced by moisture in April. These results supported previous research in indicating that climatic variability may have significant negative impacts on sage-grouse reproductive rates.

The good news is although the 2019 male lek counts are well below population goals, the Utah Greater Sage-grouse Plan objectives of increasing the sage-grouse habitat base will increase the potential for increased production and recruitment in years when climatic conditions are favorable. Based on previous reported research, the increased 2019 moisture should translate into increased sage-grouse lek counts in 2020.



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.

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