

From: [Amy Defreese](#)
To: [Jay Martini](#); [Betsy Herrmann](#)
Subject: FW: Kern River Pipeline Sage Grouse monies - East Canyon Area - Master's Project
Date: Tuesday, January 06, 2015 4:30:37 PM
Attachments: [M. Brandon Flack Short Proposal DRAFTMessmer \(3\).docx](#)

Follow up.

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From: Terry Messmer [mailto:terry.messmer@usu.edu]
Sent: Monday, January 05, 2015 6:51 PM
To: Amy Defreese; Pam Kramer
Subject: RE: Kern River Pipeline Sage Grouse monies - East Canyon Area - Master's Project

Amy

Here you go

Best

Terry

From: Amy Defreese [amy_defreese@fws.gov]
Sent: Monday, January 05, 2015 12:57 PM
To: Pam Kramer
Cc: Terry Messmer
Subject: RE: Kern River Pipeline Sage Grouse monies - East Canyon Area - Master's Project

Hi Terry,
If you have a few paragraphs you could send me that describe the purpose and methodology of the study, that would be great. I am interested to know what

Brandon will be working on specifically.

Thank you!
Amy

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From: Amy Defreese [mailto:amy_defreese@fws.gov]
Sent: Monday, January 05, 2015 12:48 PM
To: 'Pam Kramer'

Cc: 'Terry Messmer'

Subject: RE: Kern River Pipeline Sage Grouse monies - East Canyon Area - Master's Project

That is great news! Thanks for your note and the update! Yes, please keep me informed. I would love an opportunity to get out in the field.

Best regards,

Amy

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From: Pam Kramer [<mailto:pamkramer@utah.gov>]

Sent: Tuesday, December 30, 2014 9:55 PM

To: amy_defreese@fws.gov

Cc: Terry Messmer

Subject: Kern River Pipeline Sage Grouse monies - East Canyon Area - Master's Project

Amy:

I know this has been a very long time coming, but I wanted to let you know that UDWR and USU have been continually working on getting a sage grouse study underway in the East Canyon area. If you recall, we have been trying to get additional monies to partner with the \$50k that Kern River provided as sage grouse mitigation for the Kern River Apex Expansion Project.

We have finally succeeded in getting enough funds for the study!! Dr. Terry Messmer has a master's student, Brandon Flack, ready to go on the project and radio collars have been ordered. At this point, things are looking to get started in March 2015! And I hope you can join us for some sage grouse catching!!

I appreciate your patience with UDWR as we have been trying to get this project fully funded. If you have any questions, Dr. Messmer can answer them--I've "cc-ed" him on this email as well.

Thanks again for your help and patience.

Pam

--

Pam Kramer

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Habitat Use Patterns and Vital Rates of the
Morgan-Summit Sage-grouse Management Area Greater Sage-grouse Population:
Conservation Implications for Managers

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Major Advisor:
Dr. Terry A. Messmer

Advisory Committee:

Problem Statement and Research Objectives

In March 2010, the U.S. Fish and Wildlife Service (USFWS) designated greater sage-grouse (*Centrocercus urophasianus*; sage-grouse) as a candidate species for protection under the Endangered Species Act of 1973 (ESA), citing long-term habitat loss and fragmentation as major factors in observed population declines. The USFWS will decide if the species will receive full protection under the ESA in late 2015 (USFWS 2010). The State of Utah has taken a proactive approach to sage-grouse management and in 2013 the Strategic Plan for the Conservation of Greater Sage-grouse (Plan) was released for public review. The goal of the Utah Plan is to protect, maintain, improve, and enhance sage-grouse populations and habitats within the sage-grouse management areas in Utah to eliminate the need for the listing of the species under the ESA (UDWR 2013).

The largest Utah sage-grouse populations have been intensively studied over the past decade and much has been learned about sage-grouse habitat use in those geographic areas. However, less research has been conducted on Utah's smaller sage-grouse populations and there is very little information regarding the ecology of these smaller populations that could be used to guide and refine conservation recommendations contained in the Utah Plan. One such area includes sage-grouse populations that occupy private lands in Morgan and Summit Counties in northern Utah. Little to nothing is known about sage-grouse habitat use (nesting, brooding and winter use) within these areas. Sage-grouse in these smaller areas are currently experiencing various levels of land-uses which may contribute to habitat fragmentation and loss. Primary anthropogenic land uses in these areas include residential, energy, road, recreational, and power line developments.

The Morgan-Summit Adaptive Resource Management (MSARM) sage-grouse local working group (LWG) has developed a conservation plan with the goal of maintaining, and where possible, increasing sage-grouse populations and improving habitat conditions in Morgan and Summit Counties (MSARM 2006). The conservation plan identifies several strategies including, but not limited to: monitoring of leks; identification of important sage-grouse habitat use areas; and potential habitat conservation and improvement actions to improve sage brush quality. In order for meaningful conservation actions to take place, sage-grouse nesting, brooding, and wintering habitat use areas, as well as migratory corridors need to be identified. This study will provide more information about sage-grouse use of habitat areas along with vital rates associated with those areas. It will also identify potential migratory corridors or habitat fragmentation by tracking and documenting inter-seasonal movements of sage-grouse in these population complexes. Acquiring these data is critical in order to inform effective management actions that coincide with the goals of the conservation plan in Morgan and Summit Counties.

Research Questions

- ◆ What are the seasonal migration patterns and associated vital rates of the sage-grouse populations in the Morgan-Summit SGMA?
 - Are there specific travel corridors that these sage-grouse use to get from breeding locations to preferred nesting, brooding, and winter use habitats?
 - How are these migration patterns affected by differing land uses and habitat fragmentation?

- ◆ What habitats are preferred by these sage-grouse populations for nesting, brooding, and winter use areas and do they differ from random sites in vegetation structure and composition?
 - How is preferred habitat selection influenced by land use and habitat fragmentation?
 - Given the various levels of land-use in the Morgan-Summit SGMA, what is the spatial extent of potentially available nesting, brooding, and winter use habitats and how much of the available habitat is being used?
- ◆ Do different radio-marking techniques influence migration distances and vital rates of sage-grouse?
 - Are sage-grouse movements more restricted when equipped with a global positioning system (GPS) than a very high frequency (VHF) radio-collar?
 - Do vital rates of sage-grouse differ depending on the radio-marking technique?

Research Plan

Beginning in March of 2015 we will capture and radio mark 30 sage-grouse (20 females and 10 males) with VHF radio collars and 10 sage-grouse (5 males, 5 females) using camouflaged and solar-powered GPS satellite transmitters following capture protocols described by Connelly et al. (2003). Additionally, each of the 40 birds will be fitted with a numbered leg band. All sage-grouse will be captured near leks within the study area during the breeding season. Captured birds will be sexed, aged, weighed, and examined. A feather will be removed for DNA analysis, and the capture location will be recorded (UTM, 12N, NAD 83). Birds will be handled with care to mitigate capture related mortality and they will be released on site. Following release, radio-collared sage-grouse will be located using radio telemetry to determine habitat use patterns, seasonal movements, nesting and brood success, and survival rates. Marked males will be located 1-3 times per week throughout the year. Marked females will be located twice weekly until nesting begins. Nesting will be determined when a female is found in the same location on two consecutive visits during or following the breeding season. Nest status will be checked 4-5 times per week and care will be taken not to disturb nesting females to mitigate nest abandonment. After hatching, females with broods will be located weekly and brood size will be determined every 2-3 weeks to determine chick survival. Brood hopping can occur and would bias our results so we will observe the number and relative size of chicks in each brood to determine if this is occurring. Each brood will be flushed and counted six weeks after hatching to determine brood success which is constituted by brood size and chick survival. From fall to early spring, all marked sage-grouse will be located 1-3 times per week.

Upon locating a marked sage-grouse, a vegetation survey will be conducted at the location to determine the characteristics of the preferred cover and forage plants. Each survey will consist of four transects of 15 m in length at nest sites, habitat use sites, and random locations. Upon line transects, the line intercept method will be used to determine shrub canopy cover, and the Daubenmire frame technique will be used to evaluate height and species composition of forbs and grasses (Connelly et al. 2003). Robel poles will be used to determine visual obstructions that would be encountered at nest sites, habitat use sites, and random sites (Robel et al. 1970). Comparisons of these data will be made in order to determine if differences exist between preferred and random locations. Global Positioning System (GPS) technology and Geographic Information System (GIS) mapping software will be used to create a viewshed of the

species' vital rates, seasonal movements, and habitat use patterns relative to the vegetation structure and composition in the project area.

Expected Benefits

This research will enable managers, county planners, and landowners to accurately identify crucial nesting, brood rearing, wintering sites, and other habitats important to greater sage-grouse within and between these three lek complexes. Knowledge of these crucial habitat areas will both direct the location and development of habitat enhancement projects, and will also provide information to guide landscape planning efforts such as the Natural Resources Conservation Service Sage-grouse Initiative (SGI).

Expected Products

This research will describe the ecology of sage-grouse populations and the relationship between habitat use and preference, associated vital rates, and seasonal movements within Morgan and Summit Counties, Utah. Quarterly updates and annual reports will be provided to project partners. A GPS map, complete with ArcGIS shapefiles, that identifies key breeding, winter and summer habitats, and movement corridors within the study area will be provided to the Morgan-Summit Local Working Group and to the Utah DWR. A final report that includes detailed trapping information, population analyses, and breeding status of these sage-grouse populations will be given to the Utah DWR. We anticipate the submission of two scientific journal articles regarding the main objectives of this research and our findings. I will also write and defend a thesis.

References

- Connelly, J. W., K. P. Reese, and M. A. Schroeder. 2003. Monitoring of greater sage-grouse habitats and populations. Station Bulletin 80. College of Natural Resources Experiment Station. University of Idaho, Moscow, Idaho. http://sagemap.wr.usgs.gov/docs/grouse_habitat_book.pdf.
- Dahlgren, D. K., T. A. Messmer, E. T. Thacker and M. R. Guttery. 2010. Evaluation of brood detection techniques: Recommendations for estimating greater sage-grouse productivity. *Western North American Naturalist* 70:233-237.
- Morgan-Summit Adaptive Resource Management Local Working Group (MSARM). 2006. Morgan-Summit Greater Sage-grouse (*Centrocercus urophasianus*) Local Conservation Plan. Utah State University Extension and Jack H. Berryman Institute and Utah Division of Wildlife Resources. Salt Lake City, Utah. Unpublished Report. <http://utahcbcp.org/files/uploads/morgan/msarmsagrplan.pdf>.
- Robel, R. J., J. N. Briggs, A. D. Dayton, and L. C. Hulbert. 1970. Relationships between visual obstruction measurements and weight of grassland vegetation. *Journal of Range Management* 23:295-297.

U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered; Proposed Rule. Web. Accessed September 15, 2014. http://ecos.fws.gov/docs/federal_register/fr5934.pdf.

Utah Division of Wildlife Resources (UDWR). 2013. Conservation Plan for Greater Sage-Grouse in Utah. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.
http://wildlife.utah.gov/uplandgame/sage-grouse/pdf/greater_sage_grouse_plan.pdf.

Utah Division of Wildlife Resources (UDWR). 2009. Utah Greater Sage-grouse Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Publication 09-17, Salt Lake City, Utah.
https://wildlife.utah.gov/uplandgame/sage-grouse/pdf/management_plan_2009.pdf.