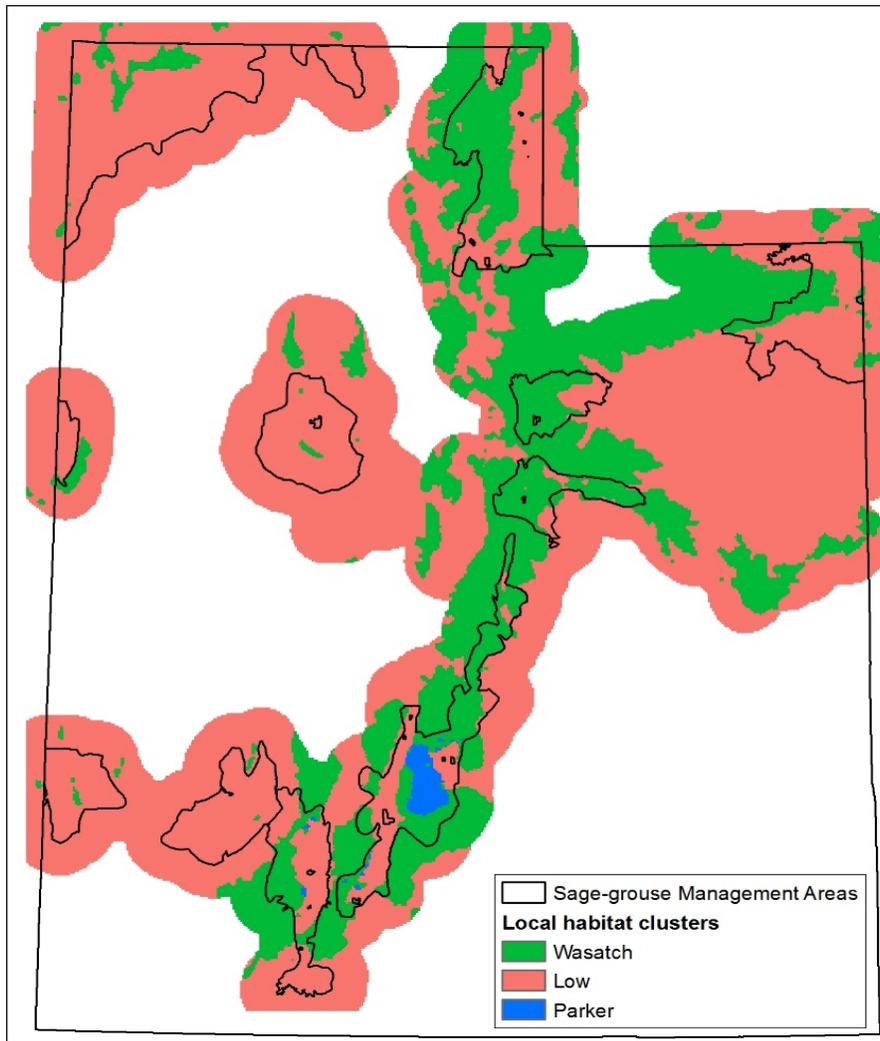


Utah's Adaptive Resources Management Greater Sage-grouse Local Working Groups

2019 Annual Report



March 2020

Utah's Community-Based Conservation Program, Adaptive Resources Management
Greater Sage-grouse Local Working Groups



Prepared by

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March 2019

Photos: The cover photo depicts greater sage-grouse (*Centrocercus urophasianus*) zones for habitat guidelines breeding and late brood-rearing habitat in Utah, 1998-2013. This paper was published in 2019 (<https://utahcbcp.org/publications/DahlgrenEtAl2019UtahSage-grouseGuidelines.pdf>) in The Wildlife Society Bulletin. The guidelines were prepared using known sage-grouse locations obtained from radio-marked birds. These recommendations now guide state and federal conservation policies.

The inside cover provides the logos for local working group partners.

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Executive Summary

Because half of Utah's greater sage-grouse populations inhabit private lands at some time during their life cycle, successful conservation will require broad support from local communities and private landowners (Utah Public Land Policy Coordination Office [PLPCO] 2019; Figure 1). In 1997, Utah State University (USU) Extension, through the Utah Community-Based Conservation Program (CBCP) began organizing and facilitating sage-grouse local working groups (LWGs) throughout Utah. The CBCP has enhanced coordination and communication between community-based adaptive resource management working groups, private, and public partners. The CBCP process has embraced a unique model that not only engaged LWG participants in conservation planning, but also identifying research questions, research funding, and conducting the research. As such, prior to any research being published in peer-reviewed journals, the LWGs and those most affected by conservation policies, are implementing management strategies and actions based on the research. Membership and participation in LWG meetings has grown steadily in Utah. The LWG sage-grouse conservation plans, previous annual reports, and meeting minutes can be accessed at www.utahcbcp.org.

There are 11 LWGs in Utah. Each LWG has developed a local conservation plan that contributed to the development Utah's sage-grouse conservation strategies. The LWG plans laid the framework for the species threat analysis and conservation strategies that were incorporated into the Utah Plan (PLPCO 2019). The LWGs and their plans continue provide the basis of implementation of sage-grouse conservation actions in Utah. The CBCP facilitators work closely with LWG members, state and federal, and private partners to implement the Utah Plan's goal of protecting high-quality sagebrush habitat and ameliorate the threats facing the sage-grouse while balancing the economic and social needs of the residents of Utah through a coordinated program.

The CBCP LWGs conservation plans encompass the historical range of sage-grouse in Utah. The CBCP has provided long-term support to ensure the LWG administrative needs are met (Belton et al. 2017). Since inception, the CBCP has been financially supported by UDWR, USU Extension, the Jack H. Berryman Institute, private landowners, public and private natural resources management and wildlife conservation agencies and organizations. Implementation of the Utah Plan will require enhanced communication and cooperative efforts among local, state, and federal agencies, working in concert with private interests. In addition to participating as active contributors to the Utah planning process, the LWGs continue to implement their local sage-grouse conservation plans.

The 2009 Utah Plans (PLPCO 2019) endorsed and incorporated the CBCP LWG process, network, education and outreach efforts, research, and local conservation plans. The LWGs operate under the umbrella of the revised Utah Plan (PLPCO 2019). This report summarizes the activities of and challenges faced by the LWGS in Utah. In 2019, we published four peer-reviewed science publication that support Utah's conservation strategy. For more information please contact Terry Messmer at terry.messmer@usu.edu.

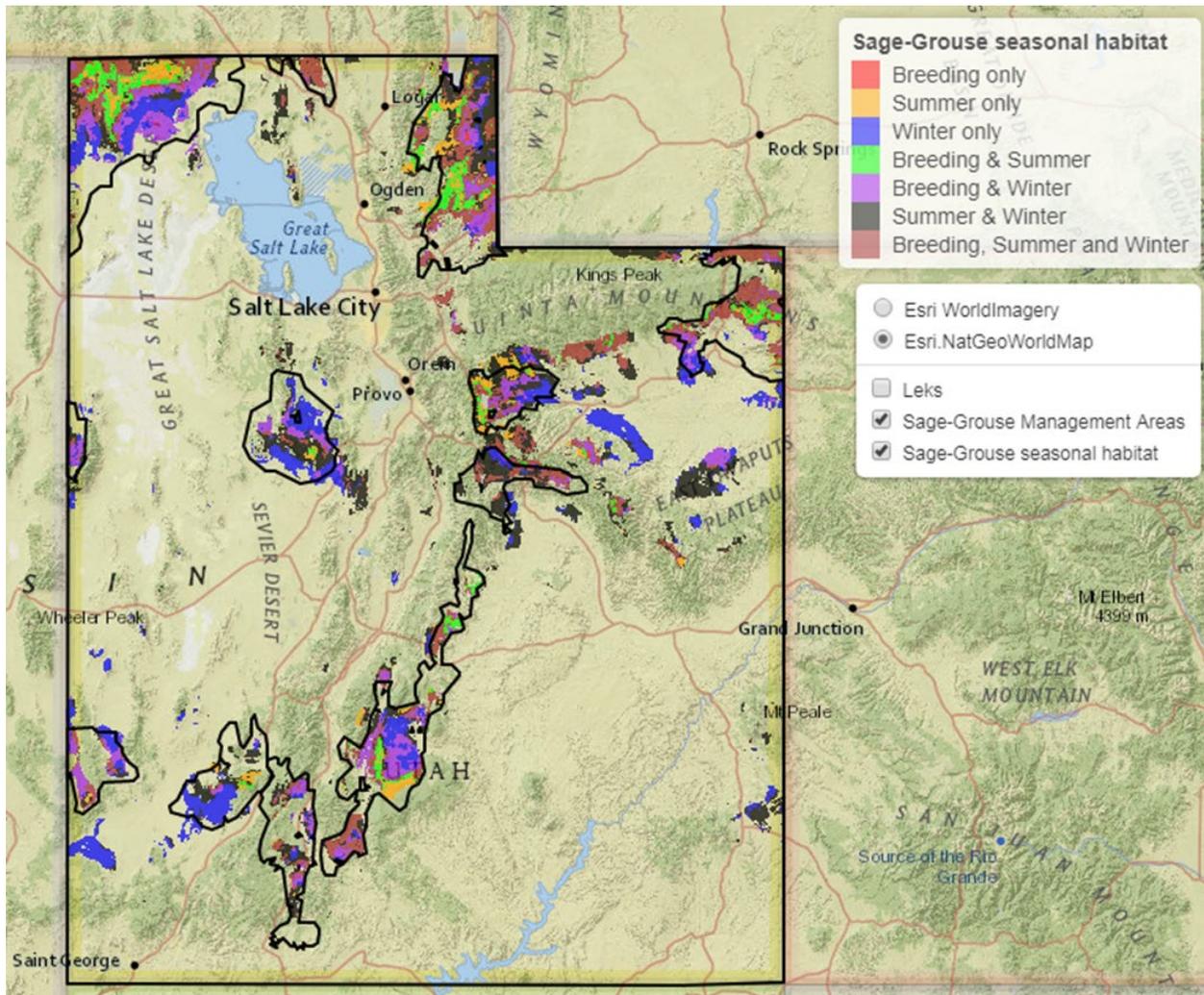


Figure 1. Sage-grouse Management Areas (SGMAs) in Utah. The SGMAs (outlined in black) represent the best opportunity for high-value, focused conservation efforts for the species in Utah (Utah Public Land Policy Coordination Office 2019). The map depicts the best available information regarding greater sage-grouse (*Centrocercus urophasianus*; sage-grouse) seasonal habitats in Utah. This map was prepared using known sage-grouse locations obtained from radio-marked birds and augmented by biologist expert opinion. These maps will be further refined in 2020 using locations obtained from sage-grouse marked with global positioning system transmitters.

West Box Elder Coordinated Resources Management (CRM) Local Working Group

The Box Elder Adaptive Resource Management (BARM) Local Working Group (LWG) was organized in 2001 by Terry Messmer. In 2011 the West Box Elder Coordinated Resource Management (WBECRM) group was organized and the LWG plan combined into the WBECRM plan. The CRM provides overall direction and guidance for habitat projects within the conservation area and Sage-grouse Management Area (SGMA). The WBECRM established a wildlife subcommittee, which encompasses sage-grouse, as part of the plan. The committee meets throughout the year to address and discuss wildlife and sage-grouse specific issues of concern, management actions, and strategies. The subcommittee reports these to the WBECRM. Danielle Kunzler is the facilitator for the CRM group. David Dahlgren is a member of WBECRM wildlife committee.

Description of Area and General Population Information

The WBECRM encompasses western Box Elder County from the Snowville area west to the UT/NV border and south to the shoreline of the Great Salt Lake. Sage-grouse habitat in this area is broken down into three sub regions, the Grouse Creek, Pilot, and Raft River range. See http://utahcbcp.org/files/uploads/BARMSAGRPlan_Final.pdf for maps and figures.

Recent Activities and Accomplishments

The West Box Elder CRM group met regularly this year. The group has multiple sub-committees, with the Rangeland Committee being the most active. Many rangeland-wildlife projects were completed and planned. The Etna fire was seeded and the CRM members had to work through available seed mixtures. There was some disagreement within the CRM participants, but those members continue to work together and the fire area was seeded. The Sagebrush Ecosystem Alliance (SEA) project coordinated by Calee Garn, continues to coordinate specific projects and partnerships within the area. Utah State University continues to conduct research on the sage-grouse population in the resource area. The current research is attempting to understand the relationship between vegetation management, especially conifer removal projects, and the local sage-grouse population. The student, Justin Small, also completed a survey of CRM participants to better understand their view of the CRM process. The survey results will be a part of Justin's dissertation. Justin will complete his defense in August 2020.

On January 28 and 30, 2020, the CRM hosted dinner meetings at two locations, Grouse Creek and Park Valley, respectively, to discuss past successes and what had been accomplish under the CRM Plan that was published in 2013. Additionally, participants discussed the priorities and objectives of the CRM moving forward. Lorien Belton, Utah CBCP facilitator help the group through the process. This process will help direct future conservation and community opportunities in West Box Elder County. The Berryman Institute and the Utah CBCP sponsored the dinner for the 100 participants.

Table 1. Meetings and tours held by West Box Elder Coordinated Resources Management group in 2019-2020.

| Meeting and Tours | Date | Location | # attending | Topics |
|--------------------------|---|------------------------------|------------------------|--|
| Meeting | March 19, 2019 | Park Valley | ~30 | Report on past projects, introductions to new members, an update on the SEA project |
| Field Tour | May 15, 2019 | Kelton | ~25 | This was a range tour, organized by the rangeland committee |
| Meeting | September 17, 2019 | Park Valley | ~30 | Talked about the future of the CRM and the current plan as well as revisions for a new plan |
| Meeting (Email) | December | NA | NA | All projects need to be approved by the CRM, so the facilitator, Danielle Kunzler, send out proposed projects by email to the group and members had a chance to comment on various proposed project, primarily through the WRI Program |
| Meeting | January 28, 2020 Grouse Creek School and January 30, 2020, Park Valley School | Grouse Creek and Park Valley | 50 attended each event | At both meetings, participants discussed the CRM successes accomplish using the 2013 CRM Plan. Additionally, they discussed the priorities and objectives of the CRM moving forward. Lorien Belton, Utah CBCP facilitator, help the group through the process. This process will help direct future conservation and community opportunities in West Box Elder County. |

Upcoming Year Work Plan

The CRM will continue to hold regular meetings. We anticipate the implementation of many projects across the resource area. We especially look forward to monitoring the impact of rehabilitation efforts on the Etna fire. Dr. Eric Thacker currently has a graduate student (MS) monitoring the vegetation response following the Etna fire. The sub-committees will continue to manage and propose new projects. In August 2020, the USU research project will deliver a conifer treatment sage-grouse habitat prioritization tool to managers. This tool will allow managers to better rank proposed conifer project's relative to the benefits provided to sage-grouse.

Plans for the CRM 2020 plan update are being discussed. It is anticipated work on the updated plan will begin this fall.

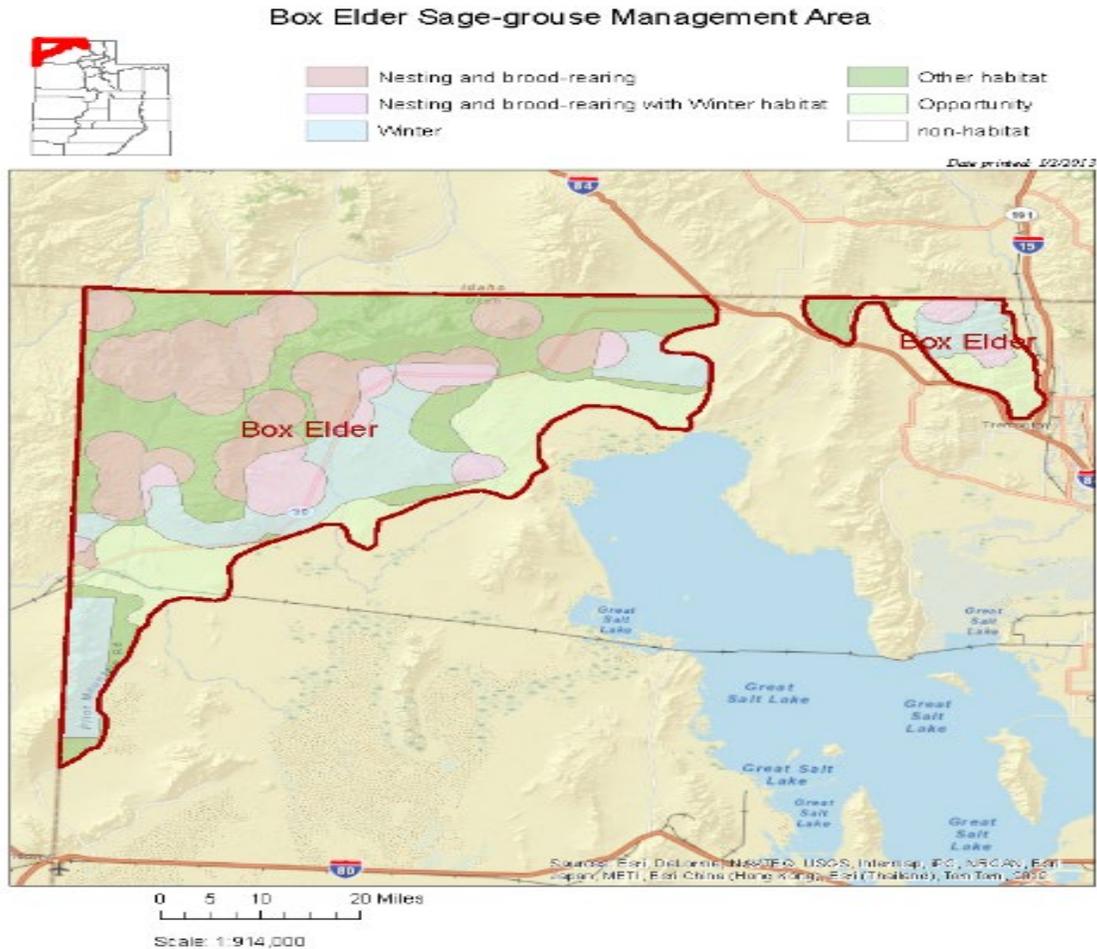


Figure 2. A map of the West Box Elder Sage-grouse Management Area depicting priority habitat areas for greater sage-grouse (*Centrocercus urophasianus*).

Castle Country Adaptive Resources Management (CaCoARM) Local Working Group

The Castle Country Adaptive Resource Management (CaCoARM) Sage-grouse LWG was organized in 2004 by Terry Messmer. Lorien Belton is currently the group facilitator.

Description of Area and General Population Information

The CaCoARM area encompasses occupied sage-grouse habitats primarily in Carbon County, with small portions of Utah and Sanpete County. Sage-grouse habitat in this area is naturally fragmented by both geology and topography. Although much of the habitat locally is within the Carbon SGMA boundary, the group also covers the Tavaputs Plateau, which is outside the SGMA. The LWG includes landowners and land managers on the Tavaputs, watching the sage-grouse population and habitat projects there, in addition to the focus on the birds within the SGMA.

Table 2. Meeting and tours held by Castle Country Adaptive Resources Management Local Working Group in 2019.

| Meeting and Tours | Date | Location | # attending | Topics |
|--|--|------------------------------|-------------|---|
| LWG meeting | Unable to be scheduled due to gov't shutdown | NA | NA | WRI project reviews (done over email to the extent possible given constraints) |
| LWG meeting | April 10, 2019 | Price BLM office | 11 | State sage-grouse plan updates, BLM and USFS planning progress, field tour planning, railroad proposal, mapping updates |
| Field tour: joint tour with 3 working groups and NER WRI (Figure 3). | July 7, 2019 | Twelve-Thousand Dollar Ridge | 48 | Fire impacts, recovery and rehab. News media interviews, restoration plans. |
| LWG meeting | October 29, 2019 | Price DNR office | 15 | BLM injunction and USFS plan amendment updates, railroad proposal presentation, WRI project discussion |



Figure 3. Fire scars on landscape during the joint field trip to the Dollar Ridge Fire. Photo courtesy of Lorien Belton.

Project and Research Highlights

The CaCoARM group is interested in the proposed railroad, and had extensive discussions around the proposed routes, possible impacts to sage-grouse and other resources, and logistics questions for the firms working on NEPA and engineering considerations for the project (Figure 4).

The federal government shutdown that began the year presented challenges for the group, although due to strong collaborative ties, projects were able to move forward despite the shutdown. As in past years, the group has been active in helping develop projects that will benefit sage-grouse and other species.

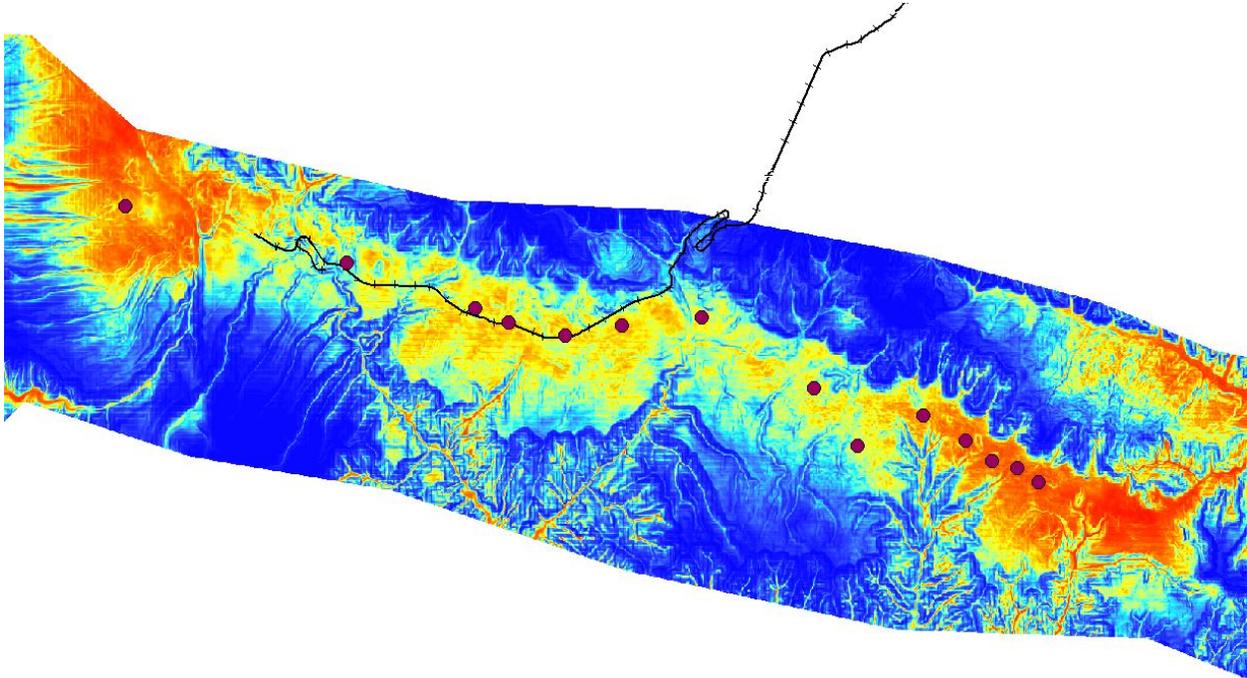


Figure 4. This “heat map” shows one of the projected routes of the proposed Uintah Basin Railway that would bi-sect greater sage-grouse (*Centrocercus urophasianus*) lek habitats in the Emma Park area. The red and yellow colors depict higher quality sage-grouse habitats.

Upcoming Year Work Plan

The Castle Country group has an interest in the possible impacts of the proposed railroad, both from private and public partners. This will continue into the new year, and the group will likely comment on the draft EIS either as a collective or in individual comments, when it is released in the spring. The group discussed whether sage-grouse response to train passage might be able to be studied either before or during the project, to better inform our understanding of the possible impacts. The group intended to revisit its local plan during 2019, but will likely do so in 2020 instead. Continuing to increase Forest Service participation in the group will be a goal for the coming year as well.

Color Country Adaptive Resources Management (CCARM) Local Working Group

The Color Country Adaptive Resource Management (CCARM) Local Working Group (LWG) is facilitated by Nicki Frey. The main purpose of the LWG is to provide a framework of strategies and associated actions that can be implemented to abate threats, address information gaps, and guide monitoring efforts. Strategies developed by CCARM were designed to be specific to the local area while taking into consideration the guidelines at a range wide level.

Description of Area and General Population Information

The Panguitch Sage-grouse Management Area (SGMA) is located in southern Utah, in Kane, Garfield, Paiute, and Wayne Counties, incorporating more than a dozen, often connected leks. Due to the population exchange throughout this Management Area, and its incorporation of the southern-most sage-grouse lek, it is considered an important population for Utah.

This population uses a series of leks throughout the habitat area, with some males visiting more than one lek per season. The population is distributed north-south in a series of linked valleys and benches, and constrained by mountains and canyons. There is a large range in the number of males in attendance among these leks. Movement of sage-grouse from one valley or bench to another among seasons is necessary to meet their seasonal habitat requirements in the highly variable annual weather conditions of this region. Movements among valleys are not present in each group of sage-grouse, and not all used areas are known to managers.

Recent Activities and Accomplishments

The CCARM continues to be active in sage-grouse research, management, and communicating issues with the group. In cooperation with Dr. Nicki Frey, CCARM has been conducting satellite telemetry research in the Panguitch SGMA since 2013 (Figure 5). In 2019, this research continued in Buckskin, Bear, and Dog Valleys, to determine their use of treated habitat within these 2 valleys and neighboring Dog Valley. Dr. Frey's PhD student, Aidan Beers, added to this study by placing temperature and light probes in a stratified-random design in Buckskin Valley and a similar valley in Nevada. These probes will remain in the valley for 18 months, collecting daily measurements. With this data, Aidan will investigate the relationship between light, a proxy for ground cover, temperature and grouse movements.

In 2019, we continued to study grouse in Alton/Sink Valley in correlation with the activities of Alton Coal Co. Grouse have started to use the habitat in a different pattern than in past years, so we anticipate data that will increase our understanding of grouse habitat use. We also consulted with the BLM to assist with the new lease for Alton Coal; adjustments needed to be made to the disturbance boundary, so that annual disturbance caps could be adjusted.

The data collected through research and monitoring continues to be instrumental in guiding annual project plans in the southern region. Each year, we hold a meeting to discuss future WRI projects that may impact sage-grouse. We provide comments and suggestions to the projects prior to their submission to WRI. Using the maps developed by our research, as well as

observation-based maps, CCARM can provide a basic overview of sage-grouse use in relation to past treatment areas, locations of travel corridors, areas that grouse seem to be avoiding, and barriers to movements.

Upcoming Year Work Plan

In 2020, Aidan will begin to finalize his data analysis on placed-based modeling of sage-grouse movements throughout the southern Utah region. He will be presenting a portion of his findings at the WAFWA grouse workshop in 2020. Dr. Frey has also employed a graduate student, beginning January 2020, to repeat a study conducted in Alton/Sink Valley in 2005-2013. This study will replicate the habitat restoration study, to determine how well treated areas developed in sagebrush-desert habitat 10 years after pinyon-juniper mastication. We will also consider how grouse are using this habitat in light of the vegetation changes.

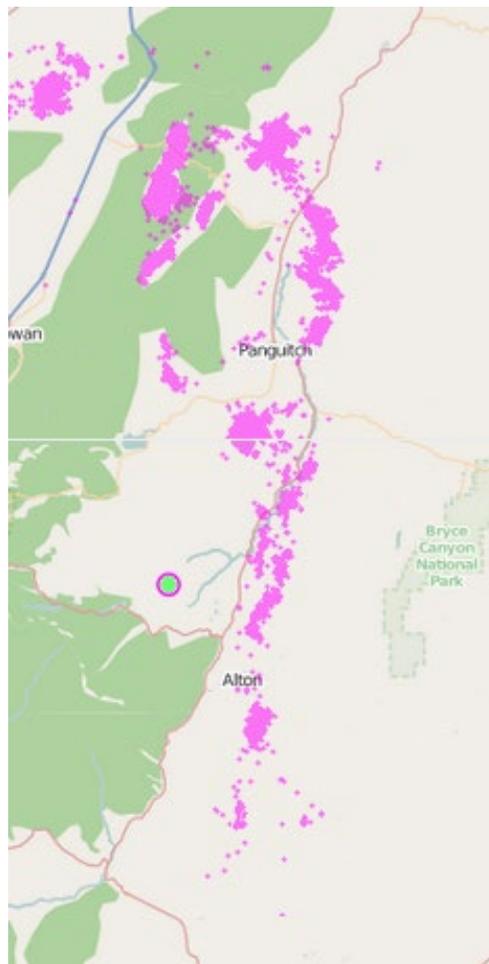


Figure 5. Greater sage-grouse (*Centrocercus urophasianus*) global position satellite radio-telemetry locations, 2013 -2019, Panguitch Sage-grouse Management Area.

East Box Elder County Adaptive Resources Management (EBARM) Local Working Group

The East Box Elder County Adaptive Resources Management (EBARM) Local Working Group (LWG) was formed in November 2015. The LWG group consists of private landowners, state and federal agency personnel, and conservation district members. The group elected C. J. Roberts and Brett Selman as their co-chairs for the group. The first objectives of the group are to learn more about the sage-grouse population in their area, which consists of nearly all private land. This included lek searches, recording wintering grouse, and communicating with landowners for their knowledge. This group is facilitated by Dave Dahlgren.

Description of Area and General Population Information

The East Box Elder area is the Sage-Grouse Management Area that lies west of I-15 and north of I-84. There are only 2 or 3 active known leks in the area with relatively few birds at each lek. Most of the lower elevations had been converted to dry farming at European settlement. Most of the sagebrush habitat is in the higher elevation rangelands. Much of the sagebrush habitat has been fragmented over the years and fire continues to be one of the most significant threats to the sagebrush communities. Cheatgrass invasion following fire is also an extensive issue in the area. The landownership is predominantly private and there is only a small section of Bureau of Land Management property in the northwest portion. The area is unique in that private landowners are numerous and landownership is not generally in large blocks. This creates its own challenges and opportunities.

Recent Activities and Accomplishments

In 2019 the EBARM group did not meet and activities have been limited. This group has not been active for several years now. There has been up to two GPS radio-marked sage-grouse in the resource area, and data has been collected by USU Extension and shared with the group (Figure 6).

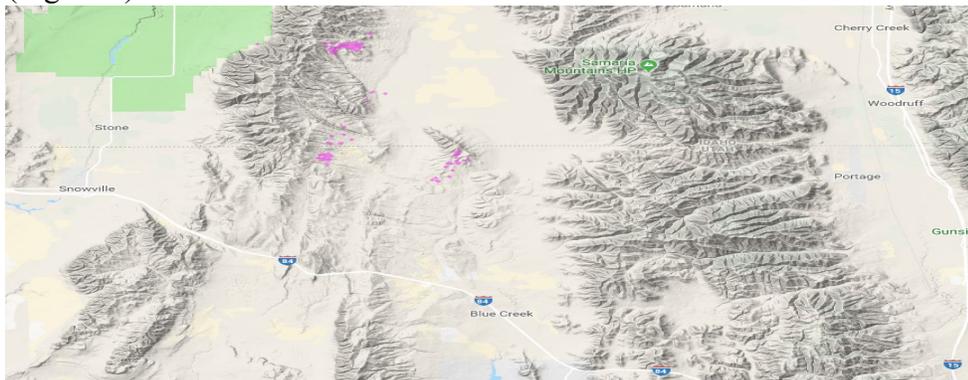


Figure 6. Pink squares represent greater sage-grouse (*Centrocercus urophasianus*) global position satellite radio-telemetry locations, 2016-2018, East Box Elder Adaptive Resources Management Local Working Group Area. No data has been collected since 2018.

Upcoming Year Work Plan

No attempts were made to reach out to the co-chairs of the group in 2019. We have had internal discussions about having Lorien Belton become the assigned facilitator and make an attempt to reactivate this group.

Morgan-Summit Adaptive Resources Management (MSARM) Local Working Group

The Morgan-Summit Adaptive Resource Management (MSARM) focuses on the southern half of the Rich-Morgan-Summit Sage-Grouse Management Area (SMGA). This group is facilitated by Lorien Belton.

Description of Area and General Population Information

The LWG area covers Morgan and Summit Counties. The two counties consist largely of privately-owned land, particularly where sage-grouse are found. Sage-grouse habitat in these areas occurs at higher elevations and is usually more mesic (and receives higher precipitation) than some of Utah's other sage-grouse areas. The sage-grouse populations in the area exhibit highly localized behavior, but are believed to have connections to populations in Rich County and southwestern Wyoming. The most prominent population lives near the Morgan/Summit county line in the vicinity of East Canyon Reservoir.

Table 3. Meetings and tours held by Morgan/Summit Adaptive Resources Management Local Working Group in 2019

| Meeting and Tours | Date | Location | # attending | Topics |
|-------------------|-------------------|--------------------------------|-------------|---|
| Regular meeting | April 23, 2019 | Coalville | 4 | Mitigation program discussion, new state plan update, BLM planning update |
| Field tour | August 14, 2019 | Private ranch in Summit County | 10 | Viewing landowner's land improvement projects, discussing future project opportunities, focus on understanding dynamics of sagebrush cover on the landscape |
| Regular meeting | November 25, 2019 | Coalville | 7 | New agency staff up to speed on sage-grouse topics, habitat mapping updates, implementation of mitigation program |

Project and Research Highlights

The group has had low attendance this year. In part, this has been due to limited NRCS staffing in the area compared to years in the past, particularly in the Coalville office. However, this year saw the addition of new staff at NRCS as well as the local land trusts, both of which are important partners when working on conservation initiatives on private land. Getting new partners up to speed on sage-grouse information and policies both locally and statewide, such as mitigation options and habitat mapping opportunities (and limitations of current maps) was a helpful role for the group this year. The processes for engaging the state's sage-grouse mitigation database for local projects was also a topic of considerable interest to attendees.

The field tour focused on a topic of growing landowner interest here and statewide: how to do sagebrush treatments in a way that sage-grouse will not be negatively affected, but meet landowner or producer objectives for livestock forage. The tour, led by a local landowner and informed by Dave Dahlgren of USU Extension, included a very robust discussion about sagebrush landscapes, restoration of wildlife habitat, and ways to include sage-grouse considerations into the planning of projects.

Upcoming Year Work Plan

In the coming year, the group will hopefully be able to involve more local landowners in conversations about habitat projects, including riparian or wet meadow restorations, habitat treatments, and possibly projects that could feed into the state mitigation database.



Figure 7. Field tour attendees discuss the complexity of sagebrush ecosystems on a field tour hosted by a Summit County landowner. Photo courtesy of Lorien Belton.

Parker Mountain Adaptive Resource Management (PARM) Local Working Group

The Parker Mountain Adaptive Resource Management Plan (PARM) Local Working Group (LWG) was organized in 1997 by Terry Messmer. PARM consists of state and federal agency personnel, representatives from local government, non-profit organizations, academic institutions, private industry, and private individuals. This LWG is currently facilitated by Dave Dahlgren.

Description of Area and General Population Information

The PARM LWG area covers portions of Garfield, Piute, and Wayne Counties that contain occupied sage-grouse habitats. Sage-grouse habitat in this area is well connected and the majority of the sage-grouse can be found on the Awapa and Aquarius plateaus. It is broken down into three sub regions; the Parker, Fish Lake, and Grass Valley. See <http://utahcbcp.org/files/uploads/parm/PARMfml-10-06-web.pdf> for maps and figures. The sage-grouse populations at Wildcat Knoll and Horn Mountain have been included with the Parker Mountain Sage-grouse Management Area. The stakeholders (e.g., U.S. Forest Service [USFS], Emery County, etc.) working on these two populations have joined PARM.

The PARM area has been the most studied population of sage-grouse in Utah going back to 1998 and there have been several publications made available through these research efforts in addition to annual reports. See <http://utahcbcp.org/htm/groups/parkermountain> for more information. The Wildcat Knoll and Horn Mountain had two years of research with radio-marked grouse from 2008-2009.

Recent Activities and Accomplishments

PARM has several issues going on this past year. We conducted our annual lek counts in April, which has occurred for the last decade or more each spring for the group. The major project going on at this time is the Mytoge Mountain conifer removal project, sponsored by WRI and led by the U.S. Forest Service, Loa Ranger District and the UDWR. Phase I was completed in 2017 and Phase II was completed this year. We purchased 6 more GPS radios to help monitor sage-grouse within the project area and were able to deploy 3 GPS units during the 2019 lekking period. This will add to several radios already deployed in the Phase I area near the Dog Flat Lek.

Table 4. Meetings and tours held by Parker Mountain Adaptive Resources Management Local Working Group in 2019.

| Meeting and Tours | Date | Location | # attending | Topics |
|-----------------------|--------------------|------------|-------------|---|
| Meeting | January 9, 2019 | Loa | NA | Cancelled due to federal shutdown |
| Lek Count and Meeting | April 18, 2019 | Loa | 15 | Conducted lek counts in the resource area, but snowpack was extreme. Update on BLM plan amendment issues. |
| Field Tour | September 12, 2019 | Greenville | 26 | Sagebrush treatment tour. Invited agency leads and habitat biologists from around the state. |
| Meeting | December 3, 2019 | Loa | 15 | Met with the group. We began discussing future sagebrush treatments within the resource area. |

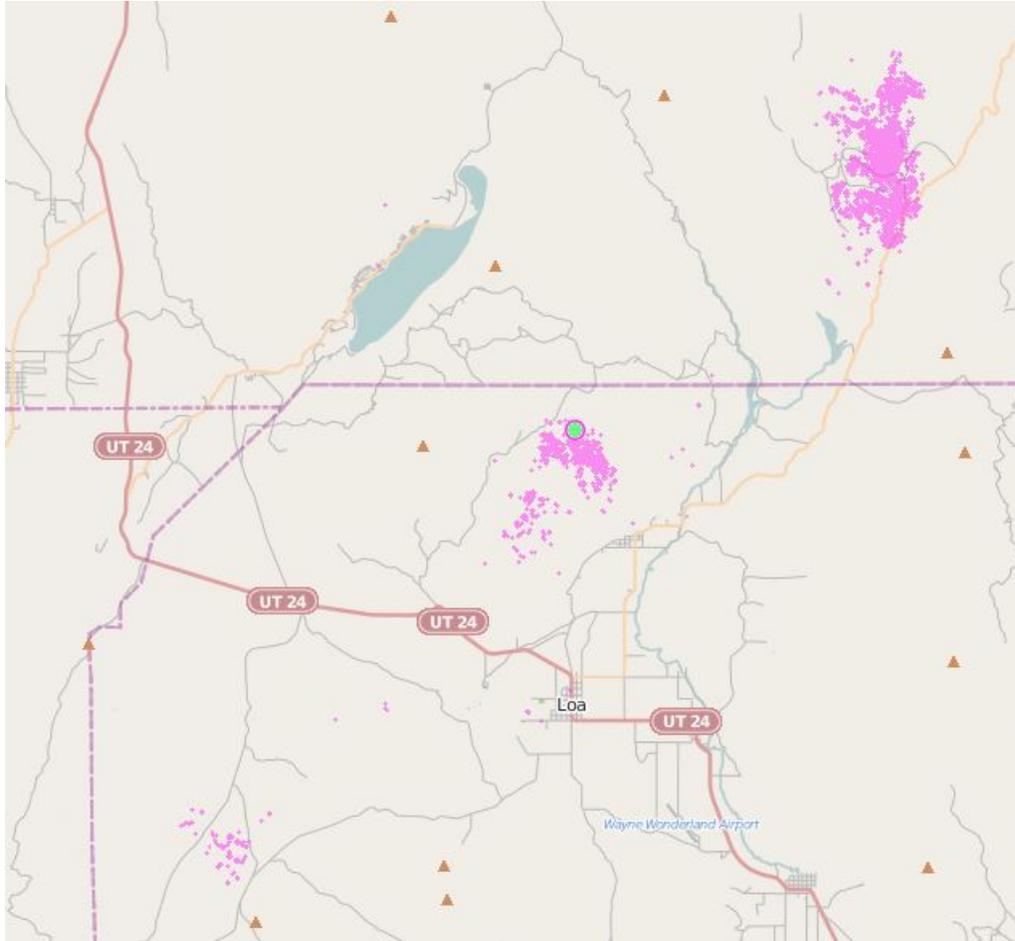


Figure 8. Map of three greater sage-grouse (*Centrocercus urophasianus*) global position satellite radio-telemetry locations that were captured in the Tidwell Slope area, north of Loa, Parker Mountain Adaptive Resources Management (PARM) Local Working Group

Upcoming Year Work Plan

We plan on conducting our annual lek counts again this April and hope for better snowpack conditions than last year. We also plan to deploy the remaining 3 GPS radios in the Tidwell Slope area of Mytoge Mountain during the 2020 spring lekking season. We will continue to hold our regular meetings, and will likely follow up the Phase II treatments on Mytoge Mountain. We will be making plans for treatment of sagebrush on Parker Mountain while keeping the conservation of the sage-grouse population paramount within our plans.

Rich County Coordinated Resource Management (Rich CRM) Local Working Group

The Rich County Coordinated Resource Management (CRM) Local Working Group (LWG) is facilitated by Dallen Smith and Dave Dahlgren. The Rich CRM consists of state and federal agency personnel, representatives from local government, non-profit organizations, academic institutions, private industry, and private individuals.

Description of Area and General Population Information

The Rich CRM management area is located in northeastern Utah, and is a significant population center for grouse in three states – Utah, Idaho, and Wyoming. The Sage-grouse Management Area (SGMA) includes Cache, Rich, Weber, Morgan, Summit and Wasatch Counties. The area boundary was determined by consulting with adjacent states, Utah Division of Wildlife Resources (UDWR), and the Morgan-Summit Adaptive Resources Management LWG, and the Rich CRM. It incorporates vegetation types used by sage-grouse, mostly in the Wyoming Basin eco-region.

Recent Activities and Accomplishments

In late August, Taylor Payne led a tour focused on the Three Creek Project including the newly installed water systems. USU research is continuing on Desert Land and Livestock and the Three Creeks Grazing Project, preliminary data has been presented to the CRM group. Poor weather in the early spring limited access to all known leks resulting in a low count. Several WRI projects are ongoing and preliminary reports were discussed. Future GIP projects are proposed in the CRM area and were reviewed by the CRM group.

Utah State University graduate student Hailey Wayment and Dr. Terry Messmer initiated new research in 2019 to evaluate the response of sage-grouse to livestock grazing (Figure 9). They will model sagebrush treatment areas on DLL to determine resource selection patterns of sage-grouse broods. While research previously reported in peer-reviewed literature has reported the potential for negative impacts of sagebrush reduction treatments, to increase livestock forage, on sage-grouse habitat, few studies have linked livestock grazing at the landscape level to vital rates for ground-nesting tetraonids such as the sage-grouse. They are proposing to parameterize sage-grouse vital rates under different grazing and treatment scenarios, this may have implications for grazing policy west-wide. Completion of this project will provide definitive information regarding sage-grouse vital rates and habitat selection with respect to the presence of cattle and the effects of livestock grazing on vegetation composition and structure. This research will also provide managers with areas most suitable for sagebrush treatments that will have positive impacts on both cattle grazing and sage-grouse. The research questions are:

- 1) Do sage-grouse brood-rearing habitat-use patterns and vital rates differ under prescribed rotational (DLL) and season-long grazing practices (3C)?

- 2) Can any of the observed differences be explained by avoidance behavior or differences in vegetation composition and structure, and the green wave that are the result of livestock grazing?
- 3) Can the green wave be facilitated, enhanced, or prolonged by managing livestock grazing?

Upcoming Year Work Plan

The CRM Plan needs to be updated so the Board plans to work on this in the Spring of 2020. A Summer Tour needs to be scheduled and follow-up on WRI and GIP projects will be on the agenda for 2020 meetings. Hailey Wayment will continue research this field season. Once approved the thesis will be available to the CRM.

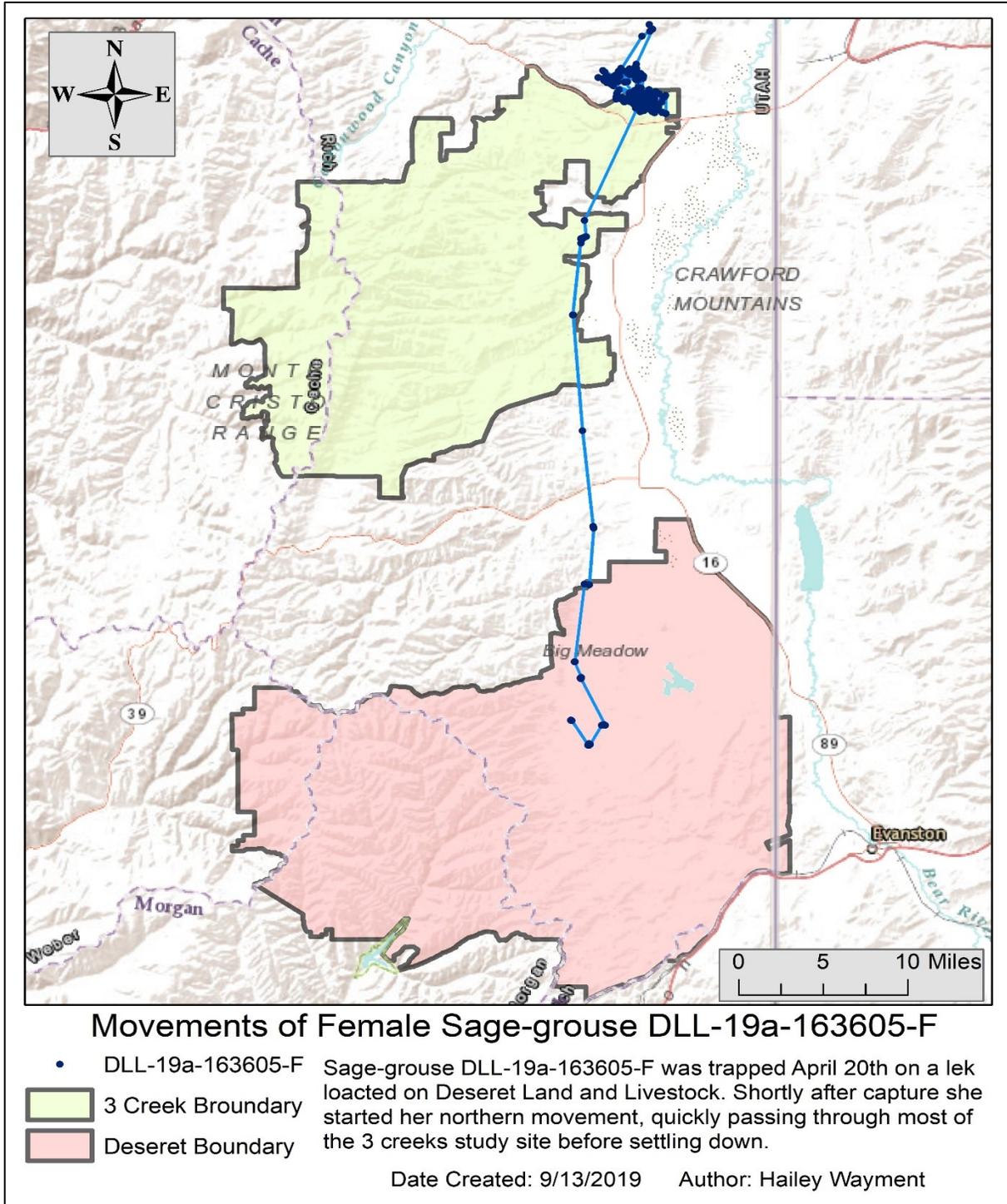


Figure 9. Movements of a female greater sage-grouse (*Centrocercus urophasianus*) on Deseret Land and Livestock (DLL) from April 20, 2019 to August 20, 2019. DLL-19a-163605-F traveled from a lek on DLL where she was collared ~40 miles north through the Three Creeks (3C) study area.

Southwest Desert Adaptive Resource Management (SWARM) Local Working Group

The Southwest Desert Adaptive Resource Management (SWARM) Local Working Group (LWG) consists of community members from Beaver and Iron Counties and is facilitated by Nicki Frey. The LWG meets every other month to discuss issues and concerns with grouse management and conservation in our region. The Governor's Task Force has recommended the development of two Sage-grouse Management Areas (SGMA) in the LWG conservation area; Hamlin Valley and Bald Hills.

Description of Area and General Population Information

The Bald Hills SGMA is located in southwestern Utah, in Beaver and Iron Counties, and is considered a population stronghold for this region of Utah. This population uses a series of leks throughout the habitat area, with males visiting more than one lek per season. Currently, the population is constrained within the SGMA by vegetation fragmentation and human development; however future improvements could connect this population to the Hamlin Valley SGMA to the west, and further north into Beaver County. The primary land uses in this SGMA are grazing, agriculture, and swine production; predominant land ownership is Bureau of Land Management (BLM) and private. The BLM manages the Bald Hills for multiple uses including conservation, recreation, energy development, and big game hunting. Residential development is present in Minersville, in the north of the Management Area, where most of the agriculture production also occurs. There is potential for wind energy production as well as current and future power transmission lines.

The Hamlin Valley SGMA is located in southwestern Utah, in Beaver and Iron Counties, on the border of Utah and Nevada and is considered a population stronghold for this region of Utah. Although currently isolated from other habitat areas, habitat restoration could link this population to the Bald Hills SGMA. The primary land use in this SGMA is grazing; predominant land ownership is BLM. The BLM manages Hamlin Valley for multiple uses including wild horse conservation, recreation, and big game hunting. Development is limited to scattered houses, generally in the southern portion of the SGMA.

Recent Activities and Accomplishments

The SWARM continues to be active in conducting research to determine sage grouse response to habitat treatments. They have been supporting Dr. Frey's research since 2015 (Figure 10). In 2018, Dr. Frey recruited Aidan Beers, as a USU PhD student to analyze all the radio-telemetry sage-grouse location data collected from 2015- present. In 2019, Aidan continued this research and began initial analysis of the data. This research is highly valuable to the BLM, which has a valley-wide EA in place to conduct habitat treatments for the next decade.

The SWARM also plays a large role in the Watershed Restoration Initiative (WRI) projects proposed in the Southern region, that overlap with occupied sage grouse habitat have the option to be vetted through SWARM prior to being submitted to WRI. The data collected through

research and monitoring continues to be instrumental in guiding annual project plans in the southern region. Each year, we hold a meeting to discuss future WRI projects that may impact sage-grouse. We provide comments and suggestions to the projects prior to their submission to WRI. Using the maps developed by our research, as well as observation-based maps, SWARM can provide a basic overview of sage-grouse use in relation to past treatment areas, locations of travel corridors, areas that grouse seem to be avoiding, and barriers to movements.

Upcoming Year Work Plan

Dr. Frey and Aidan will continue to analyze and report on sage-grouse habitat use in Hamlin Valley. There has also been brief discussion of repeating the research conducted in the Bald Hills to enable comparison of habitat use pre and post habitat treatment. Aidan will report on his initial findings at the WAFWA grouse workshop in 2020.

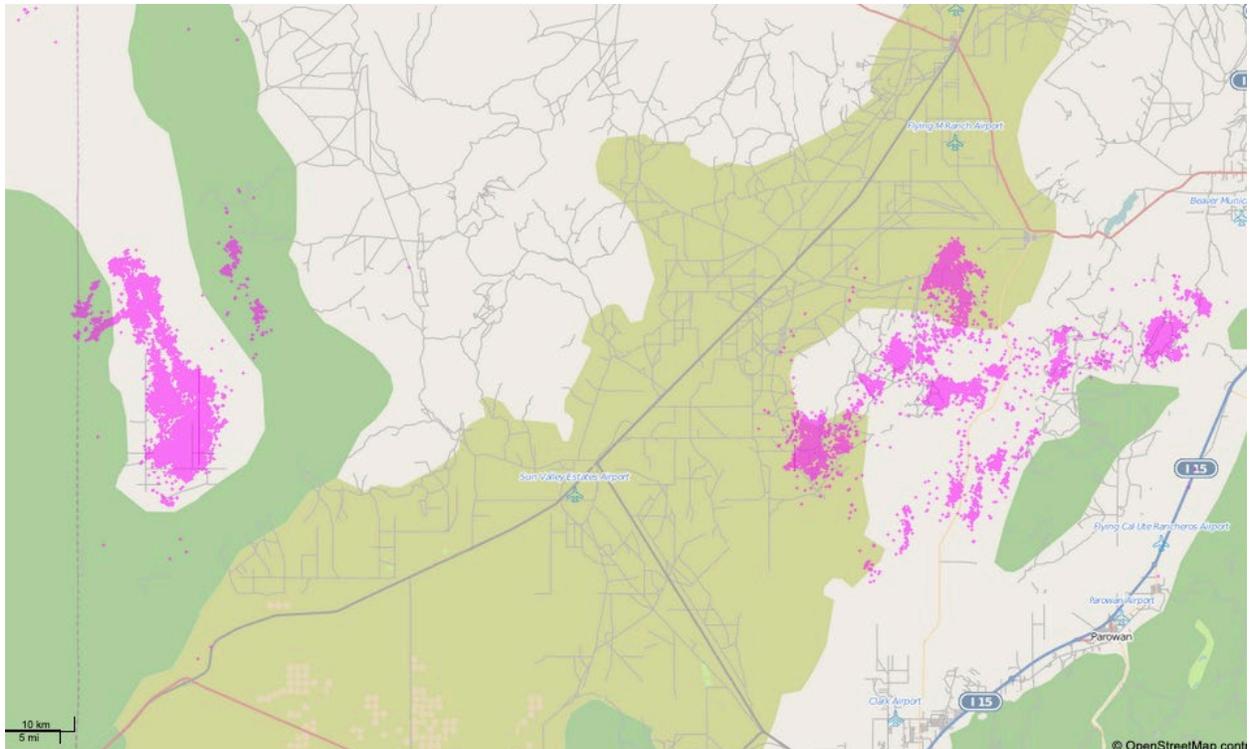


Figure 10. Greater sage-grouse (*Centrocercus urophasianus*) global position satellite radio-telemetry locations, 2015-2020, Bald Hills and Hamlin Valley, Sage-grouse Management Areas.

Strawberry Valley Adaptive Resource Management (SVARM) Local Working Group

The Strawberry Valley Adaptive Resource Management (SVARM) Local Working Group (LWG) is facilitated by Lorien Belton.

Description of Area and General Population Information

The Strawberry LWG conservation area covers portions of both Wasatch and Duchesne Counties. There are leks and associated nesting/brood-rearing areas both at high elevations around the Strawberry Reservoir, as well as in the lower-elevation Fruitland area in Duchesne County. The birds winter primarily in Fruitland at lower elevations. Predator control efforts, particularly red fox control, played a large role in helping the sage-grouse population rebound from previous lows. Habitat projects over the course of many years have also helped by providing improved habitat for the population, which appears to be relatively stable at this time.

Table 5. Meetings and tours held by Strawberry Valley Adaptive Resources Management Local Working Group in 2019.

| Meetings and Tours | Date | Location | # attending | Comments |
|-------------------------|------------------|------------------------------|-------------|---|
| Meeting | March 14, 2019 | Heber | 11 | BYU research updates, Dollar Ridge fire report, field tour planning |
| Field Tour (Figure 11). | July 8, 2019 | Twelve-Thousand Dollar Ridge | 48 | Post fire habitat visits, fire management discussions, coordination with other LWGS visiting the SVARM area. |
| Meeting | December 2, 2019 | Heber | 10 | Habitat mapping, Forest Service and BLM planning updates post injunction, BYU updates, project planning discussions, wildlife fencing, TransWest siting approvals |

Project and Research Highlights

BYU researchers continue to be a key partner in the SVARM group, providing regular updates both at meetings and over email throughout the season, to help the group stay apprised of grouse activity. This year saw the planning and implementation of a few projects. Maintaining existing

project areas for sage-grouse habitat use, and addressing weed issues to place more projects on the ground, were a major focus for the group this year. Projects on private land in the Fruitland area continue to be planned and implemented thanks to the SGI biologist with Pheasants Forever and NRCS.

Federal planning and new habitat mapping efforts were of interest to the group, but did not cause any significant challenges for the group, since Forest Service plans were not officially amended, pending the resolution of challenges to BLM's plan amendments.

Upcoming Year Work Plan

The group is interested in participating in the next iteration of the revised habitat maps being worked on by USU. Final results from the BYU graduate student's work will be a focus, as well as continued work on habitat project planning by Forest Service and other partners. TransWest transmission line discussions near Tabby Mountain, and Forest Service's long-term fire management planning will help determine the groups' focus in the coming year as well.



Figure 11. Local press representatives accompanied the Dollar Ridge fire joint field tour. Here, biologists explain sage-grouse habitat needs in an area not impacted by the fire. Photo courtesy of Lorien Belton.

Uintah Basin Adaptive Resource Management (UBARM) Local Working Group

The Uintah Basin Adaptive Resource Management (UBARM) Local Working Group (LWG) is facilitated by Lorien Belton. It is closely tied to the Uintah Basin Partners for Conservation and Development/Watershed Restoration Initiative, often coordinating meeting scheduling between the two groups.

Description of Area and General Population Information

The Uintah Basin LWG covers parts of Duchesne, Uintah, and Daggett counties. A large population with multiple leks inhabits the Diamond Mountain area north of Vernal. This area has mixed landownership, including private, state, and federal lands, and is used primarily for agricultural purposes. The Diamond Mountain population is one of the few populations in Utah that is robust enough to support a limited sport hunt in the fall. Additional sage-grouse populations occur south and west of Vernal in areas including Forest Service land on Anthro Mountain, and BLM land further south. The southern populations in particular are in areas that have been highly impacted by oil and gas development. Some populations also occur farther south into the Book Cliffs. Populations on Seep Ridge, Deadman Bench, Little Mountain, Anthro Mountain, and Diamond Mountain have been the subject of research studies over the course of multiple years. Areas of Duchesne County used by the Strawberry Valley sage-grouse populations are also of interest to the UBARM group.

Table 6. Meetings and tours held by Uintah Basin Adaptive Resources Management Local Working Group in 2019

| Meetings and Tours | Date | Location | # attending | Comments |
|------------------------|-----------------|------------------------------|--------------|--|
| Meeting | Feb 12, 2019 | Vernal | Estimated 25 | Joint WRI meeting for project reviews of sage-grouse benefit and other projects |
| Meeting | April 16, 20189 | Vernal | 9 | Population research updates from tribe and DWR, new BLM plan amendments, new state sage-grouse plan, USFS planning updates |
| Field Tour (Figure 12) | July 8, 2019 | Twelve-Thousand Dollar Ridge | 48 | Joint tour with WRI northeastern region, and the Strawberry and Carbon sage-grouse groups |

| | | | | |
|---------|------------------|--------|----|--|
| Meeting | October 22, 2019 | Vernal | 13 | BLM injunction, Uintah Basin Railroad proposal, habitat mapping at state level by BLM and USU, round robin |
| Meeting | December 3, 2019 | Vernal | 15 | BLM supplemental EIS and other injunction-related planning, Habitat Assessment Framework basics |



Figure 12. A large group attended the joint field tour to view the Dollar Ridge Fire area. Photo courtesy of Lorien Belton.

Project and Research Highlights

The government shutdown complicated the project planning and review processes that many of the sage-grouse group members participate actively in, preventing earlier meetings in January to discuss upcoming projects or other developments. However, once the shutdown ended, group members returned to collaborative efforts on habitat work, and planning efforts.

The changes in federal planning, with the new BLM plan amendments being finalized in March and then prevented from implementation by the court injunction in October, provided much fodder for discussion. Projects moved forward after discussion about whether (or if) any changes were needed. Everyone continued to participate in mapping and other coordination efforts – including implementation of the Habitat Assessment Framework – despite the additional complexity.

The Ute tribe has been involved in more depth this year than previously; the group will continue to support tribal efforts as assistance is requested. The tribal representative expressed interest in potentially collaring and tracking sage-grouse in the future.

The group discussed the Uinta Basin Railroad proposal at length in the fall of 2019. Although the majority of potential impacts to sage-grouse are not in the Uinta Basin, the group heard presentations and discussed potential impacts and opportunities at length.

Upcoming Year Work Plan

The UBARM group will continue to stay apprised of developments with the railroad Proposal, including commenting on the draft EIS when it is available. The group will also likely discuss the contents of, and possible written responses to, the BLM's supplemental EIS when it is released in the later winter/spring of 2020. The group is also interested in continuing to review draft habitat maps as they are developed and refined by BLM and USU. Research efforts will also continue locally, with the addition of new tracking collars to augment existing collars on the air that are monitored by DWR and jointly funded by USFS, BLM, and DWR.

West Desert Adaptive Resource Management (WDARM) Local Working Group

The West Desert Basin Adaptive Resource Management (WDARM) Local Working Group is facilitated by Lorien Belton. The group covers two areas: Ibapah, on the western border of Utah with Nevada, and the Sheeprock Mountains (in Tooele and Juab counties). Due to concern over population declines in the Sheeprocks, the WDARM group has also become the Technical Committee tasked for overseeing a series of enhanced efforts in the Sheeprocks to reduce threats to sage-grouse and help the population rebound. Although the majority of the group’s focus is on the Sheeprocks population area, the group tries to meet once each year in Ibapah.

Description of Area and General Population Information

The West Desert Adaptive Resource Management LWG conservation area encompasses sage-grouse habitats in Tooele and Juab counties. The two primary population locations are far apart: one in western Tooele County in the Ibapah region (including the Goshute Tribe’s land), and the other at the eastern side of the two counties, known as the Sheeprocks. These more eastern populations include birds in the Vernon area as well as in the Tintic Mountains. Population trends in the area have been a focus of concern, when in 2015, lek counts which rebounded in other part of the state, including Ibapah, did not rebound in the Sheeprocks. Several years of translocations appear to have at least temporarily stabilized the population. A large amount of research and habitat improvement efforts have been part of this working group’s efforts.

Table 7. Meeting and tours held by West Desert Adaptive Resources Management Local Working Group in 2019.

| Meetings and Field Tours Type | Date | Location | # attending | Comments |
|--------------------------------------|---------------------------|------------------|--------------------|---|
| Landowner dinner | January 24, 2019 | Vernon | 22 | Landowner-focused presentation and opportunity for questions on recreation research, sage-grouse translocations/research, and agency staffing changes |
| Meeting | March 26, 2019 | Tooele | 18 | Agency personnel changes, new state plan, BLM plan amendments, sage-grouse and hydrology research updates, project implementation and future planning |
| Field Tour – cancelled | October 9, 2019 (planned) | Ibapah (planned) | NA | cancelled for the year due to weather and logistics – will be revisited in 2020 |

| | | | | |
|---------|-------------------|--------|----|--|
| Meeting | November 20, 2019 | Tooele | 19 | New agency staff updates, sage-grouse research updates, hydrology research discussion, BLM planning updates (post-injunction), upcoming projects |
|---------|-------------------|--------|----|--|

Project and Research Highlights

The West Desert group has a wide group of involved agencies and landowners, and brings many different topics to the table. Sage-grouse research continues in the area, with 2019 seeing a final year for translocations from outside the area to augment the population. Associated with the sage-grouse population research, graduate student Melissa Chelak is also conducting raven surveys and continuing the surveys of recreational use in the area (Figure 13). The Utah Division of Wildlife Resources has worked to stabilize riparian areas in the Vernon area, with multiple projects on private and public lands.

Topics that arose this year and will continue to keep the group’s attention include wild horse and sage-grouse work in the area, BLM planning changes due to the federal judge’s injunction, and an increased focus on predator management, particularly ravens.

Upcoming Year Work Plan

In 2020, we will continue monitoring marked sage-grouse and capture additional resident grouse for tracking. No additional translocations will be done, but recreation research and raven transects will continue. The partnership between USGS, WRI, BLM, and WDARM will be continuing as well, with more conifer treatments planned to occur as part of a long-term study of tree removal on water resources in the Tintics. Multiple projects are in the works for the coming year, including fuels management and habitat improvement-focused projects across public and private land. The group will also work to reengage in the Ibapah area in 2020.

Topics to be addressed this coming year will cover recreation, planning, predation management, and continued efforts for conifer removal, fire resiliency, wet area habitat improvements, and continued research on sage-grouse populations and groundwater.

March 2019 GPS-Marked Greater Sage-grouse Movements in the Sheeprock SGMA

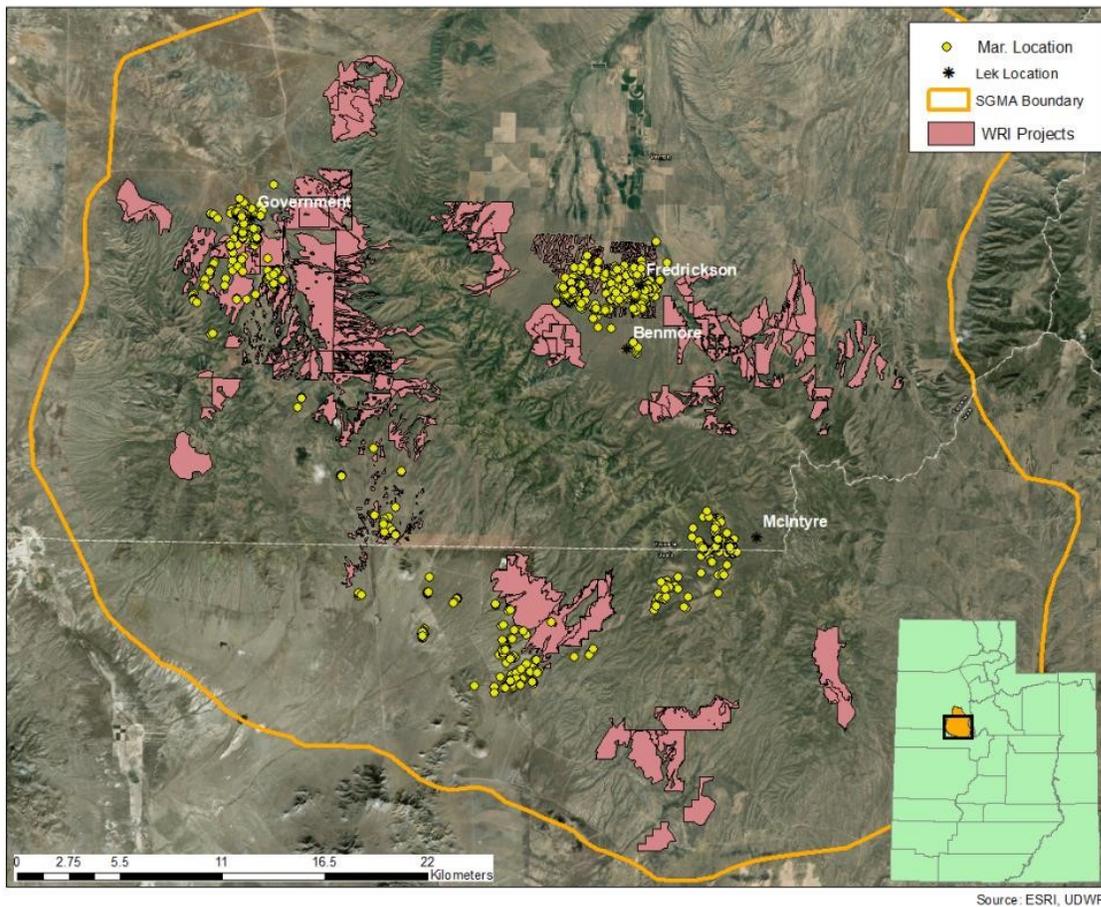


Figure 13. Locations of global positioning system (GPS)-marked greater sage-grouse (*Centrocercus urophasianus*) in March 2019 with the Watershed Restoration Initiative (WRI) completed habitat restoration projects, Sheeprock Sage-Grouse Management Area, Utah, 2019.

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