2006 FINAL REPORT

USDA-NATURAL RESOURCES CONSERVATION SERVICE
GREAT BASIN COOPERATIVE ECOSYSTEMS STUDY UNIT
COOPERATIVE AGREEMENT # 68-9327-2-03 MODIFICATION NO. 5

The Current Status of Sage Grouse Management Technology on Private Lands

Prepared by
Terry A. Messmer
Utah State University Extension Service

January 2007

Executive Summary

USDA-Natural Resources Conservation Service (NRCS) Wildlife Habitat Management Institute and Utah State University Extension (USUEXT) entered into an agreement to improve conservation practices that deal with grazing management, wildlife habitat management, and other agricultural techniques that assist NRCS field staff helping farmers and ranchers with conservation planning to improve greater sage-grouse habitat on working farms and ranches.

Anticipated benefits include financial assistance to farmers and ranchers and habitat improvements. Current practices on grazing lands involve converting grasses and forbs traditionally associated with sagebrush-steppe habitat to grasses more beneficial to cattle grazing. Such alterations may result in decreased greater sage-grouse populations and necessitate the listing of greater sage-grouse as a threatened species. Such a listing would impose tremendous management restrictions on farming and ranching operations. This project will also benefit field staff of NRCS and its partners by providing new technology to help with conservation planning.

Summary of Activities Completed Under the Agreement

WHIP/EQIP Upland Wildlife Habitat Management Training Workshop

A field tour and sage-grouse habitat management training workshop for NRCS field staff, biologist, and other wildlife managers was conducted on July 19-20, 2005. the workshop was hosted by the Parker Mountain Adaptive Resource Management Working Group (PARM). A copy of the workshop agenda and registration form is included in Appendix 1. A copy of the workshop materials is enclosed.

The workshop was attended by 40 people representing NRCS, the Bureau of Land Management, the Utah Division of Wildlife Resources, the U.S. Forest Service, Utah School and Trust Lands Administration, Nature Conservancy, U.S. Fish and Wildlife Service, Utah Farm Bureau Federation, Utah State University Extension, Utah Association of Soil conservation Districts, US Geological Services, private landowners, and elected officials.

Topics Discussed

PARM is an volunteer organization consisting of a group of people of diverse backgrounds and interests who forged a partnership to achieve a common good. They started out in 1997 with one central goal – they wanted to "grow grouse." Although concerns about declining sage-grouse populations first brought them together, their commitment to sustaining their community and its natural resources still holds them together. In the past decade, PARM's efforts have increased sage-grouse populations from about 600 birds to over 4500. Most of the habitat work conducted to "grow grouse" has been accomplished largely with funding provided through conservation provisions of the Farm Bill. Because of their past effort efforts and future plans, in 2004 PARM received the largest Natural Resource Conservation Service Wildlife Habitat Incentive Program Cost-Share ($350,000) ever awarded. In 2005, Parker Mountain was recognized by the Utah Section of the Society for Range Management as the "Rangeland of the Year." They have recently implemented a 10-year adaptive resource management habitat monitoring program to

evaluate the effects of management actions on greater sage-grouse and other wildlife populations. This plan embraces efforts to manage for pygmy rabbits, seek recovery and delisting of the Utah prairie dogs, using livestock to manage for wildlife, and practical methods to regenerate aspen.

Where is Parker Mountain?

Parker Mountain is located in south-central Utah in Garfield, Piute, and Wayne counties. Parker Mountain is approximately 265,584 acres in size and is managed by private, state, and federal entities. It is home to antelope, deer, elk, sage-grouse, pygmy rabbits, Utah prairie dogs, and a many other wildlife species. The landscape is composed of multiple sagebrush species, including big sagebrush, silver sagebrush, and black sagebrush as well as a variety of grasses and forbs.

The sagebrush habitat on the Parker Mountain is one of the largest contiguous tracts in Utah, and has escaped development pressures Annual precipitation on Parker Mountain varies in elevation, ranging from 10-20 inches per year. Precipitation comes mostly in the winter in the form of snow and late summer monsoons. In addition to a few springs at higher elevations (> 7400 ft), many water developments are scattered throughout the area.

Land use

The predominant land use in the area is grazing by domestic livestock. The Parker Mountain Allotment is divided into a series of 10 pastures totaling 72,143 acres; 5,120 acres BLM lands and 67,023 acres state trust lands. The pastures are grazed seasonally on an elevation gradient. Beginning in early May through June 1, approximately 1,348 cow calf pairs are placed into the two lower elevation pastures (<7400 ft) and grazed for three to four weeks. The timing of this rotation depends on forage utilization. The allotment is managed to achieve 50-60% forage utilization prior to rotations. During May, sage-grouse nest in the Big Mountain Wyoming Sagebrush found in the upper end of these spring pastures. Pygmy rabbits also inhabit these areas.

After 3-4 weeks, the livestock are moved to four mid-elevation pastures (7400-8000 ft) and graze there through July. Again, the timing of the rotation depends on achieving 50-60% forage utilization. Although sage-grouse also nest in these pastures, this area provides important brood-rearing habitat.

After July, most of the cattle have drifted to the four higher elevation pastures (>8000 ft). These pastures contain aspen stands, conifers, and mountain big sagebrush. The fall pastures provide later season sage-grouse brood rearing areas as the hens' move their chicks to higher elevations as the lower pastures begin to dry out. After completing this seasonal rotation, the cattle are gradually moved back through the pastures in late September and are taken home by October 15.

Sage-grouse Population Status

Although, Parker Mountain exhibits one of the largest contiguous tracts of sagebrush in Utah sage-grouse populations in the area were experiencing declines similar to other areas in the West.

Sage-grouse population estimates were 5,200-9,200 in 1935-1936; by 1969 the population estimate was only 3,000. The Utah Division of Wildlife Resources (UDWR) has counted the number of strutting cocks on leks nearly every year since 1967. The lek is the area where cocks gather to strut and attract females for the chance to breed. Lek counts are used to estimate population numbers. (need a lek photo) The sage-grouse population estimates have fluctuated through the last two decades. Although increasing trends in sage-grouse numbers are being reported rangewide, the Parker Mountain population has increased 8 fold over the last 8 years.

To address sage-grouse declines and assist in recovery, ranchers, state and federal agency personnel, Utah State University Extension personnel, and other local stakeholders joined together to form the Parker Mountain Adaptive Resource Management (PARM) working group in March 1998. PARM began by initiating a study to determine the status of sage-grouse populations, their habitat use patterns, and identify factors that potentially limited sage-grouse production. This began with identifying all active and historic sage-grouse leks, counting strutting males following Utah Division of Wildlife Resource protocols. This was followed up by research conducted to evaluate sage-grouse response to management projects. PARM's primary focus was "grow grouse " by improving sage-grouse habitat.

Initial Research Findings

Research on Parker Mountain began when the Parker Grazing Association presented Utah State University with a $3,000 check to purchase radio collars to monitor sage-grouse hen habitat use and productivity. With the help of these collars, researchers determined nest initiation, nest success, predation rates, and clutch size. They also sampled vegetation canopy coverage of shrubs, forbs, and grasses. They determined that the traditional sage-grouse brood-rearing habitat was in poor condition. It was dominated by Big Mountain sagebrush canopy that had little or no forb and grass underneath. The forbs are critical to chick survival. In addition to low nest success, few of the broods monitored had chicks that survived to become adults.

Habitat Management Experiments

Because vegetation sampling indicated that the increased sagebrush canopy cover was out competing grasses and forbs for water, PARM decided to set up an experiment to test this hypothesis. They decided to set up several 100 acre experimental plots that would be treated with the Dixie harrow, Lawson aerator, and a chemical treatment (Spike) to reduce sagebrush canopy coverage from 40% down to 20%. This work was done in 2000 and 2001. The cost of treating the plots was provided through Natural Resources Conservation Service (NRCS) Wildlife Habitat Incentive Program (WHIP). After the work had been done, researchers went back to the plots and measured the vegetation and monitored use of the area by sage-grouse and sage-grouse broods.

Because it would be cost to much to radio collar and follow every sage-grouse on Parker Mountain, researcher decided to use dogs to locate and flush grouse and their broods in early August. They than count the birds flushed from each plot to see if there where any differences. In addition, because grouse defecate regularly leaving pellets piles, the frequency and occurrnec eof these pellet piles can also provide some indication of use. By tracking sage-grouse using these

methods, they learned that grouse definitely preferred the treated areas. The treated areas had more grouse and more pellet piles than untreated areas. The areas treated with Spike exhibited the highest grouse flush counts and number of pellet piles. These sites provided smaller open patches of cover that contained sage-grouse skeletons. In this small open patches the grouse found abundant forbs close to overhead cover, They also found more grouse and pellet groups within 30 feet of the edge of the treatment plots than any other areas. This suggested to PARM that any future treatment to reduce Big Sagebrush canopy cover should be done to increase the amount of edge between open cover and sagebrush. Thus, to benefit grouse, the strategy should be to open small linear plots in the middle of sagebrush seas and opposed to treating large stands. Once small areas are treated and allowed to recover, than other plots can be subsequently treated.

Based on the findings of these experiments, more treatments were implemented. In 2001, PARM received a $35,000 grant from the Intermountain Joint Venture. These funds were used to manipulate an additional 1000 acres and fence upland areas adjacent water source to enhance vegetation cover and reduce sediment loading in ponds. Given the increasing cost of using fossil fuels to conduct mechanical treatments, PARM is now looking at using biological methods like prescribed livestock grazing to maintain treated areas and to treated new areas to create a landscape the offer a mosaic of vegetation types and structure. To date, about 3000, acres have been treated in the form of small plots scattered throughout the mid-elevation pastures.

This work was completed using money provided by a WHIP grant received through NRCS.. In 2004, PARM received a $350,000 WHIP grant. This is the largest WHIP grant ever awarded by NRCS. In 2005, Parker Mountain and PARM were recognized by the Utah Section of the Society for Range Management as the Utah Rangeland of the Year.

It is interesting to note that in interviews with retired ranchers, we learned that in the 1930-40s when sage-grouse populations on Parker Mountain were at an estimated all time high, the livestock stocking density was considerably higher than it is currently. We also learned there we more sheep moving in small band around the mountain. To enhance the forage potentials for their livestock, the herds and ranchers would burn and treat small patches in Big Mountain sagebrush. Thus, by using this regime, they were creating a landscape that exhibited different age-classes of vegetation types. Sheep bedding area where used as lek sites by grouse. Still today, some of the historic bedding areas are occupied by some of the largest leks.

Also during this time, predator control was conducted by USDA/APHIS Wildlife Services. . More recently, for livestock protection, mammalian predators are controlled. This control contributed to dramatic increases observed in Parker Mountain pronghorn populations. These pronghorn can be also be seen frequently grazing and bedded down in the small plots that were treated. In 2001, USDA APHIS Wildlife Service, because of concerns about the potential impacts of ravens on sage-grouse nests and chick also began placing eggs treated with DRRC-1339 prior to the nesting season. Research completed in 2005 demonstrated high nest success and chick survival. Nest success have steadily increased and been more consistent. Chick survival is estimated at 70% and annual adult mortality is less than 10%..

Thus, the dramatic population increased is no doubt the result of a number of factors working in concert of which habitat management has been very important.

Mitigation Banking and Utah Prairie Dogs

The Utah prairie dog, *Cynomys parvidens*, is listed as threatened under the Endangered Species Act. The State of Utah School and Institutional Trust Lands Administration (SITLA), in cooperation with USU Extension, UDWR, and the US Fish and Wildlife Service, decided in 2002 to establish three mitigation banks (Flossie Lake, South Buttes, and Tanks) on Parker Mountain for the Utah Prairie Dog. The Conservation Banking Agreement was completed and implemented in 2005. A perpetual conservation easement for nearly 800 acres was signed and an endowment fund established. This action was the first of its kind in the nation.

The bank can provide opportunities to mitigate the impacts of authorized activities affecting such species elsewhere, such as Garfield, Iron, Wayne, and Piute Counties, after a Habitat Conservation Plan (HCP) is approved. The primary goal of the bank is to enhance and restore habitat for the Utah prairie dog in the Awapa Plateau Recovery Area in a manner that will contribute to its conservation and ultimate recovery.

Each prairie dog taken throughout the service area is required a minimum purchase of two credits from the bank. The number of credits at the bank available for sale or use by SITLA is earned by creating habitat and the count of prairie dogs observed in two successive spring counts. If the average of two spring counts exceeds 25 prairie dogs, then SITLA can earn 50 credits. At every threshold of 25 more prairie dogs, 50 additional credits can be earned, up to twice the numbers of credits per acre in the bank site.

In 2005, 77 credits were available based on the previous two years spring counts at the South Butte and Tanks mitigation bank sites. These credits were all sold to Iron County, who in turn sold them to private developers for $1,636 each, plus $200 per credit for the perpetual endowment fund.

Future plans for the mitigation bank sites include vegetation treatments at all three sites to improve prairie dog habitat, annual dusting of the bank sites for plague, monitoring, signing, and predator control specific to prairie dogs. All treatments will be paid for using the endowment fund (currently $75,000) and most of the work will be accomplished by the UDWR by agreement. The endowment fund has been established using two grants from the Endangered Species Mitigation Fund totaling $58,720. The sell of 77 credits has brought in another $15,400. This perpetual endowment fund has been placed into an interest bearing account that has earned some additional monies.

Utah prairie dog-livestock interactions

The Parker Mountain is located on the Awapa Plateau in south-central Utah. This Plateau is one of 3 Utah prairie dog recovery areas. The prairie dog population in this area is below recovery goals established in 1991 by the U.S. Fish and Wildlife Service (USFWS). In 2002 the USFWS approved 3 Utah prairie dog mitigation banks on the Awapa Plateau. Little information exists regarding how these mitigation banks should be managed to optimize benefits for the species. Past research has suggested that management actions to reduce shrub canopy cover results in increased grass and forb cover and may benefit Utah prairie dogs.

From 2002-2005, we evaluated the effects of 20-30%, 50-60%, and 80-90% forage (grass) utilization rates, using domestic cattle under a high-intensity/short duration grazing regime, on Utah prairie dog habitat use and foraging behavior on rangeland owned by SITLA on Parker Mountain. Parker Mountain is included in the Awapa Plateau recovery area. We wanted to determine if high forage utilization by cattle over short periods could improve Utah prairie dog habitat by reducing shrub cover. Additionally, we wanted to determine what forage utilization rate would be most compatible with the management of prairie dogs. We found no evidence that any of the forage utilization levels tested affected Utah prairie dog densities or burrow density. However, Utah prairie dogs spent more time foraging and were less vigilant under high (80-90%) cattle forage utilization. Higher foraging rates by cattle coincided with reduced grass cover in the high utilization pastures. No change in plant composition, particularly shrub cover, was detected for the forage utilization rates implemented during this study.

Our results suggest that implementation of high forage utilization by cattle (80-90%) may negatively effect Utah prairie dogs if it results in increasing predation risks or reduced energy intake. Currently, livestock grazing on the Awapa Plateau (SITLA lands) is managed to achieve a 50-60% forage utilization rate. Our research suggests this forage utilization level is compatible with Utah prairie dogs even through it coincided with peak prairie dog nutritional needs. However, because no reductions in shrub cover were detected even under the highest forage utilization level evaluated, we recommend that mechanical treatments be evaluated for use on the Awapa Plateau to improve Utah prairie dog habitat in areas with shrub cover exceeds recommended guidelines. We recommend that the use of livestock, particularly sheep be implemented and evaluated to maintain treated areas. In summary we did not detect any evidence that current grazing regimes as implemented by SITLA lands on the Awapa Plateau are detrimental to Utah prairie dogs.

Sage-grouse brood-hopping

In 2005 a 1.5 gram radio was attached to random chicks to document mortality of marked chicks, overall brood mortality, and brood hopping (chick leaving its mother to join another hen).

Researchers documented brood hopping as early as within the first week and as late as the sixth week in 10 (46%) broods. Prior to this study, it was thought that chicks would not hop during their first 3 weeks and any chicks missing from the brood were thought dead. Thus brood survival and recruitment were being underestimated.

Regenerating Aspen

In October 2004, Dr Dale Bartos (Aspen Ecologist, US Forest Service) affirmed the need to help the regeneration of aspen stands on Parker Mountain. He suggested the lack of regeneration in the aspen stands was inhibiting the new regeneration from growing to maturity. Researchers had document that higher elevation aspen stand that were exhibiting some regeneration were also being used by sage-grouse broods.

In 2005,five aspen stands were selected for a regeneration experiment. Each stand was divided into two areas. One clear-cut area and one uncut area. The clear-cut area was divided into three smaller 30m x 30m plots. One plot was fenced, another jack-strawed, and the third was left open.

The uncut portion of the stand was divided into two side by side plots . One plot was fenced and the other was left open. Vegetation data to include percent composition of forbs, grasses, and shrubs, along with the number, diameter, height, and herbivory of aspen ramets were collected. The experimental plots were clear-cut in late November when the aspen trees were dormant. The cost of the clear-cutting was covered by the WHIP grant and landowners.

Sagegrouse use of aspen stands was documented by flush counts in late August for the last few years. In mid to late summer of 2006 visual animal surveys were used to obtain deer, sagegrouse, and small animal use. The surveys were conducted three times a day morning, noon, and evening on ten randomly selected days. An outer loop (30meters from edge of treatment), and an inner loop (immediately around the treated area) were walked during the survey. Pellet counts were also collected for each plot.

None of the stands had less than fifty percent canopy cover before they were clear-cut. Although the data is still being analyzed, pictures reveal the clear-cut plots that were fenced have produced the most ramets. It was also apparent that greater densities of aspen regeneration were found in the drag trails created when the stands were clear-cut. Sagegrouse, deer, rabbits, squirrels, and cattle were all observed at different rates during the animal surveys. Many neo-tropical bird species such as the Mountain Bluebird, House Wren, Warbling Vireo, and Northern Flicker were identified.

PowerPoint Presentation

The PowerPoint presentation to deliver training on Upland Wildlife Habitat Management, Brush Management and Prescribed Grazing with sage grouse considerations to landowners and other interested groups was completed in March 2006. It was decided at that time that, instead of developing one presentation for NRCS field offices and one for landowners, it would be more advantageous to develop only one in-depth presentation that could be used to deliver training to NRCS field offices and later presented to landowners by the trainees.

This presentation can be found at https://sgrp.usu.edu/htm/learningtools. The master copy was sent to Karen Fullen for reproduction and distribution.

NRCS job sheets

Three job sheets, one each for Upland Wildlife Habitat Management, Brush Management, and Prescribed Grazing with sage grouse considerations, were completed in May 2006. Upon completion, NRCS personnel agreed it was more beneficial to combine the three job sheets into one technical note.

NRCS technical note

The technical note initially was born of the compilation of three job sheets designed to provide options for landowners wishing to improve sage-grouse habitat. This technical note has undergone a lengthy review process by NRCS personnel and leaders in the field. Editors include Karen Fullen (NRCS), Jeremy Maestas (NRCS), Shane Green (NRCS), Dean Mitchell (Utah

Division of Wildlife Resources), and Jack Connelly (Western Sage and Columbian Sharp-tailed Grouse Technical Committee member).

After numerous revisions, NRCS personnel redirected this note to follow the format of previous technical notes. Therefore, this technical note now is a modification of the research data recently published by David Dahlgren (Appendix 2). David's paper was published in the Wildlife Society Bulletin as part of a special section on the Fish and Wildlife Benefits of the Farm Bill.

I anticipate final approval of this note in early 2007. A draft of the note is included in Appendix 3.

Future Plans

Although still in the editing process, we are hopeful this technical note will soon be published by NRCS and provide the desired information and assistance NRCS initially anticipated.

Appendix 1

WHIP/EQIP Upland Wildlife Habitat Management, Brush Management, and Grazing Management Training Workshop

Date: 19-20 July 2005
Location: Wayne County Extension Office
18 S. Main, Loa, Utah
Phone 435-836-2765
Parker Mountain Tour

Purpose: This workshop is designed to provide participants with a better understanding how WHIP and EQIP conservation practices can be used to manage for sage-grouse, other sensitive species, and achieve landowner production objectives.

Who Should Attend: NRCS field staff, federal, state and private agency and/or organization land management personnel and biologists.

Scope: Participants will tour sagebrush treatments and grazing trials implemented on Parker Mountain that were funded through EQIP and WHIP programs. As part of the tour, participants will receive handouts and reports that document the positive effects of these treatments on wildlife and range productivity.

Workshop Details: There is no fee for attending the workshop. Participants will be responsible for making their own travel and lodging arrangements. If participants wish to arrive on the afternoon of the 19th, we have reserved lodging for 9 people at the Road Creek Lodge, located at 504 South Main Street in Loa. The cost of this lodging is $35 and will include a Dutch Oven supper.

Workshop sponsors will provide all materials, refreshments, and a lunch on July 20th. We will have vans available for the tour. Participants may use their own vehicles for the tour.

Weather: The temperatures during the day may approach 90 degrees F. The sun can be intense so bring some sun screen, sunglasses, and hats. This time of the year you can also expect some afternoon rain showers.

Attached please find a workshop registration form. Please note that if you arrive early you can have the opportunity to fly fish for trophy trout or trap shoot (costs are provided on the registration form). If you wish to participate in any of these activities, please indicate on your registration form and we will make the reservations. Lastly, please let us know if you have any special dietary requirements or other accommodations.

Agenda:

Time	Activity	
19 July 2005		
12:00	For early arrivals. Arrive at Loa, register at the Inn, and participate in special activities	
6:00 pm	Dutch Oven Supper	
20 July 2005		
8:30	Registration at Extension Office Courthouse, 18 S. Main Loa, Utah	Leslie Elmore, USU
9:00	Introductions and Purpose	Verl Bagley/Terry Messmer, Utah State University Extension
9:30	Travel to Field Sites	
10:00	EQIP Sagebrush Treatments	Terry Messmer/David Dahlgren, USU; Tom Jarman, NRCS
11:30	PARM	Gary Hallows, PARM
12:00	Lunch	provided
1:00	Utah Prairie Dog Mitigation Bank WHIP Habitat Improvements to Create Utah Prairie Dog Habitat	Ron Torgerson, Utah State Trustlands
2:00	Using Grazing to Manage Utah Prairie Dogs	Dwayne Elmore, USU
4:00	Adjourn	

REGISTRATION FORM:

WHIP/EQIP Upland Wildlife Habitat Management, Brush Management, and Grazing Management Training Workshop
Date: 19-20 July 2005

Name_____ Title_____

Agency_____ E-mail_____

Address_____ City_____ State____ ZIP_____

___ I will be attending the workshop on July 20.

___ I will be arriving July 19th.

___ I would like to stay at the Road Creek Lodge ($35—*please provide credit card info below or you may pay by check or cash the day of*).

___ I will make my own lodging arrangements.
(Snuggle Inn 55 S. Main in Loa 435-836-2525 or
Aquarius Motel 290 W. Main in Bicknell 435-425-3835)

___ I am interested in trap shooting (~$20/round).

___ I am interested in fly-fishing for catch-and-release trout ($75/half-day).

___ I will be attending the Dutch Oven supper.
Special dietary concerns: _____

___ I will be arriving by plane and require pick-up from the airport.
Time of arrival _____ AM/PM (circle one).
Which Airport – SLC or Cedar City (circle one)

Credit Card Payment ($35 will be charged to card for Road Creek Lodge stay)

___ Visa ___ Mastercard ___ Discover

Name on Card _____ Signature _____

Billing Address _____ City_____ State _____ ZIP _____

Account # __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ Expires _____

Please complete and return **by June 20th** to Leslie Elmore via e-mail at LeslieE@cc.usu.edu, by mail to 5230 Old Main Hill, Logan, Utah 84322, or call 435-797-3974.

Appendix 2