

# Greater Sage-grouse Lek Searches Via Helicopter Utah 2012

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**Abstract:** *A systematic greater sage-grouse (Centrocercus urophasianus) lek survey via helicopter was conducted in 3 of 5 Utah Division of Wildlife Resources (UDWR) regions in 2012. Surveying was conducted in applicable habitat areas where no sage-grouse leks are known or recorded. A brief helicopter lek survey for sharp-tailed grouse in spring 2008 proved effective in locating new leks for that species. We incorporated this survey technique for locating sage-grouse leks in habitats throughout Utah. Since leks form the basis of most all of sage-grouse life activities and also form the basis of most all management efforts, a thorough inventory of leks will greatly benefit the species. The effort will help focus UDWR conservation efforts to areas of importance to the species and its crucial habitats. Five mornings, in March and April 2012 were spent surveying for greater sage-grouse in Utah. Eight sage-grouse sightings (some coveys with >1 sage-grouse) were documented during the 11 hours and 29 minutes of survey time; 48 sage-grouse were observed. One new potential lek was discovered during the 2012 lek search efforts. All flight paths and sightings were recorded and maps are provided in this report. It is recommended to continue the survey efforts, even at a high financial cost. The data provided will be useful in management of the species and potentially impede the need for listing under the Endangered Species Act.*

Both the greater and Gunnison sage-grouse (*Centrocercus urophasianus* and *C. minimus*, respectfully) are Candidate species for listing under the Endangered Species Act of 1973. Both species are also listed as State Sensitive Species for Utah. The Utah Division of Wildlife Resources (UDWR) focused tremendous energy and resources into locating sage-grouse leks and defining populations during the 1960 and 1970 decades. Acquiring this knowledge base formed one of the most extensive and continuous monitoring systems for this species across its range. While ground searching for new leks continues, most work is directed toward monitoring known leks and populations. In spite of this effort, there are many areas of the state that remain relatively unsurveyed for the existence of sage-grouse leks.

Sage-grouse life history is tightly woven around leks. Most critical habitats are associated within a 4 mile radius of a lek. Therefore, leks also form the basis of most sage-grouse management surveys and population monitoring for resource agencies. With the growing intensity of human activities relative to sagebrush ranges, greater and Gunnison sage-grouse remain in the spotlight for possible Endangered Species Act (ESA) applications. The need for a broader and sounder knowledge base at the local lek level remains paramount.

This work will result in a more systematic search for leks. It will incorporate helicopter flights in every region of the state. Flights will occur at sunrise and continue for

approximately 2 to 3 hours. Grids will be flown at low elevations where observers will search for lek site. Flight paths will be documented with global positioning systems (GPS) tracking inclusive of lek or other relative observation waypoints. A map data base will be developed to document the survey efforts and the results. Any new lek location or significant observations found from the air will be visited on the ground to more accurately determine the Universal Transverse Mercator (UTM) GPS coordinates and other pertinent information such as access routes for future survey efforts. The intent is to provide a reliable, systematic, and organized survey. Managers can then direct efforts toward other conservation activities once a reliable knowledge base of the lek inventory is established.

No federal or state compliance is required for this project; except perhaps for obtaining permission to fly over dedicated military airspace or Indian Reservation lands if necessary. An aerial survey also precludes the time necessary to obtain permission to access private lands or other limited access areas.

### **Goals and Objectives**

The goal of this research project is to inventory as much of the sage-grouse habitat in the state and build a lek inventory database and mapping record. The ultimate goal is to prevent an ESA listing of greater sage-grouse by creating a better resource knowledge base and more effectively direct habitat improvements or other conservation efforts to affected areas.

### **Tasks**

1. Organize flight survey areas in each region of the state
2. Systematically survey/search these areas from the air during peak lek activity periods.
3. Record, report, and document flight tracks, surveyed areas, newly located leks and other pertinent information in a DWR database.
4. Incorporate newly located leks into the annual lek monitoring and count program.
5. Determine if telemetry studies or other monitoring or management activities are warranted in newly located lek areas.

The estimated project cost was \$50,000 for fiscal year 2009 with intent to continue for at least one (FY10) but, preferably until all potential lek areas are surveyed. The \$2M legislative sage-grouse appropriation was the funding source. The Upland Game Program Coordinator (Jason Robinson) will lead the effort with assistance and coordination with each of the 5 respective regions and the Habitat Section GIS biologist. Regions will prioritize the initial and subsequent survey areas each year to insure prime areas are all covered. Flights will occur during good weather observational conditions and will begin at daylight and continue until lek attendance wanes. Flights will be conducted during periods of peak male lek attendance; generally the last part of March and the first few weeks of April.

An annual report and complete GIS record of the flight and its findings will be completed by July 1 of each year in which the survey is done.

The Utah Greater Sage-grouse Management Plan 2009 states as one of its objectives and strategies the following, which is directly applicable to this work:

**Objective A-1: Monitor, protect, and maintain current population numbers.**

**A-1.1 Population Monitoring**

**A. Lek Surveys.**

3. Conduct planned and systematic surveys and searches for new and unidentified leks in all potential habitats. Document, map, and file all search areas with GPS tracks.

**Methods:**

Each of the 5 UDWR regions chose their highest priority areas in 2009 to conduct the searches. It was determined to fly in each of the 5 regions in 2009 to train personnel and refine methods. Each area of the state has special considerations when flying, and by flying each region of the state the methods could be better refined for each particular area of the state. Methods were refined following the 2009 survey efforts. In 2010 and 2011, 2-3 of the 5 UDWR regions were surveyed to help with logistical issues faced in the 2009 survey effort. 4 of the 5 UDWR regions were planned to be surveyed in 2012, however only 3 were surveyed.

**Helicopters** were used for these aerial surveys. Calm, clear mornings are a prerequisite to aerial searches. Cocks can be observed from the air at distances >1 km (0.6 mi) in early morning sun, but cloud cover greatly reduces observation ability. The early morning sun tends to illuminate the white breast of strutting males making them visible for up to 1 mile under ideal light conditions. Scattered snow cover can also reduce observation ability; the white breasts of the males tend to blend in more with their surroundings. Under conditions of marginal light or snow cover, transect width should be narrowed. Surveys were conducted in reasonable weather conditions, although not always ideal.

Suspected breeding habitat was flown on north - south transects with lines about **1 km (0.6 mi)** apart, where applicable. Transects were flown at about **50-150 meters (150-500 ft)** above ground level. Flight speed varied based on conditions but was generally between **30-60 mph**. Speed of the aircraft was slow enough to allow for recognition of sage-grouse. All flight paths were recorded with a GPS in datum **NAD83**. All newly identified leks had UTM waypoints recorded, as well as any sage-grouse observed. At least **two observers** were used in addition to the pilot so that one observer was always looking away from the sun regardless of the direction the aircraft is flying. In addition to the pilot and two observers, the local UDWR biologist guided the pilot to the survey locations and served as a navigator and observer. Survey intent was to begin at the closest perimeter of the survey area and work away to minimize the possibility of the ship flying over leks prior to them being observed. Where feasible, the survey began over the area receiving first sunlight and continued progressively east to follow the sunrise. Flight observations were conducted from **½ hour before to 2 hours after sunrise**. In some instances a transect path other than straight north and south may be more appropriate (i.e. following contour of a mountain range). For consistency, these alterations should be minimal and justifiable. Flight paths were still recorded. All sage-grouse sightings were

recorded with a waypoint on a GPS unit in UTM NAD83. Bird numbers and gender were also recorded whenever possible.

All data was entered into an excel spreadsheet and filed within the state GIS database.

## **Results:**

The areas flown in 2012 were:

**Central Region:** San Pete (Figure 1) on 4/20

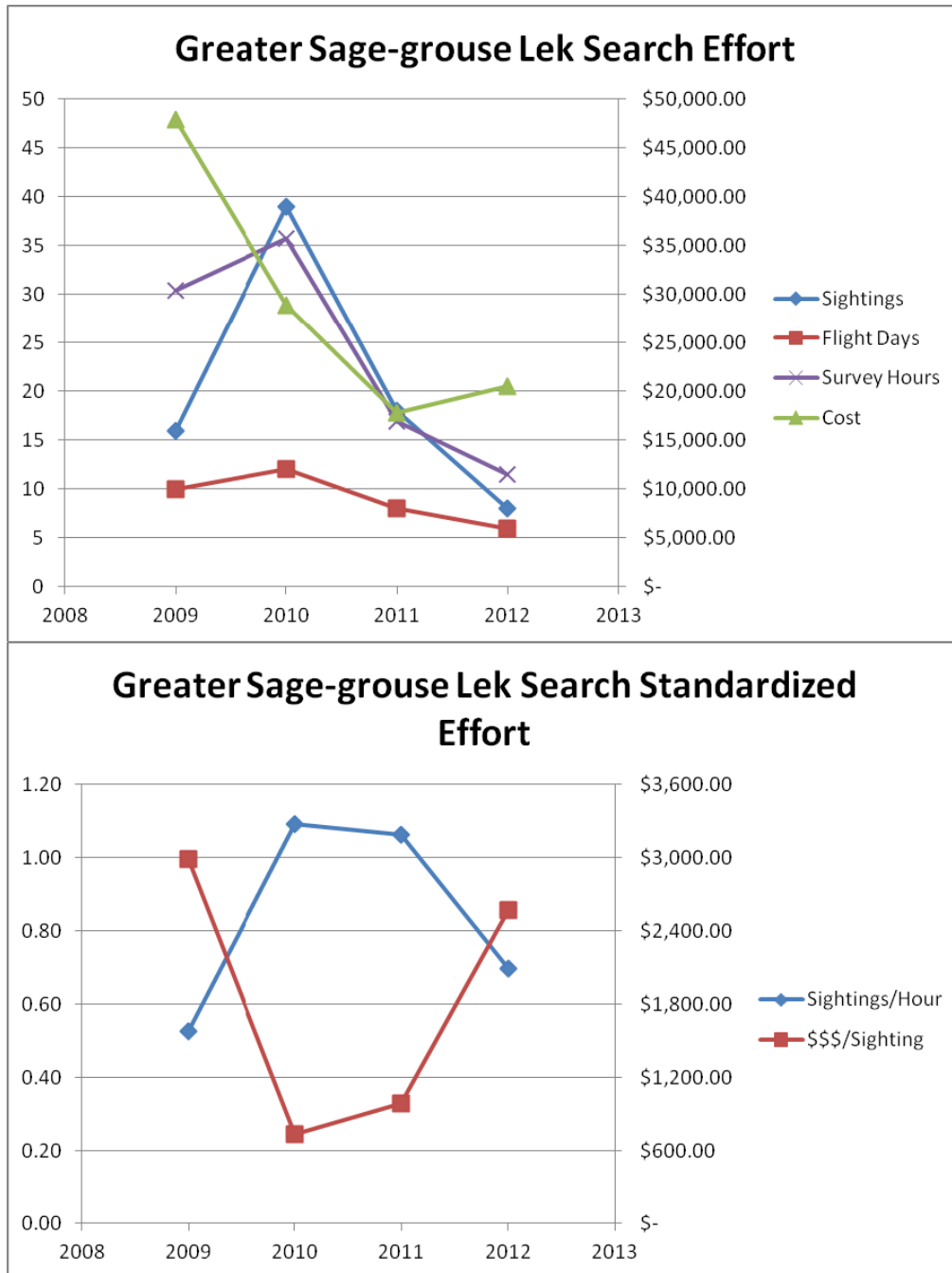
**Northeastern Region:** Winter Ridge (Figure 2) on 4/20

**Northern Region:** Morgan Summit (planned but not flown)

**Southern Region:** Alton Coal #1 (Skutumpah Terrace, Sink Valley; Figure 3) on 3/15; Alton Coal #2 (Ford Pasture, Sink Valley, Hatch Bench; Figure 4) on 4/9; Alton Coal #3 (Hatch Bench, Sage Hen Hollow, Little Valleys; Figure 5) on 4/30; Johnson Ranch (Figure 6) on 4/3.

Greater sage-grouse lek surveys were conducted in 3 of the 5 UDWR regions. Surveys were done on 1 morning for the CR, 1 morning for the NE, 1 area was cancelled for the NR, and 4 mornings for the SR. In total, 6 mornings were flown. Alton Coal funded 2 of the flights, so the 2012 greater sage-grouse lek location helicopter survey total cost to the Division was \$20,452 for 4 flights; split between Classic Helicopters, New Air and Utah Highway Patrol (UHP). Due to a significant increase in the cost of the UHP helicopter in 2012, the number of survey days was decreased by 40%.

The survey encompassed 5 flight days, the earliest on March 15 the latest on April 30. The range of survey time was from 0628 to 0955, with total survey time of 11 hours and 29 minutes. The total hours spent flying, including ferry time, was 15 hours and 2 minutes. Four survey areas had no sage-grouse observed during the flight (CR – San Pete; NE – Winter Ridge; SR – Alton Coal #1 and Johnson Ranch); the SR Alton Coal #2 survey area had the most sightings; with 6 total sage-grouse sightings (some sightings had multiple sage-grouse). A total of 8 greater sage-grouse sightings were located during the survey. This is 0.69 sage-grouse sightings/hour of survey time, or \$2567.75/sighting. During the 2009 survey, observers had 0.74 sage-grouse sightings/hour of survey time, or \$2990.94/sighting. During the 2010 survey, observers had 1.33 sage-grouse sightings/hour of survey time, or \$739.22/sighting. During the 2011 survey, observers had 1.28 sage-grouse sightings/hour of survey time, or \$988.91/sighting. Most of the sightings were of single sage-grouse. The total number observed was 45 sage-grouse in total survey time. Of the 8 sage-grouse observations 1 was a new location of strutting sage-grouse, the rest were of flushing grouse or known leks.



## Discussion:

Spring weather conditions in 2012 were near average for most of the state, however they followed a low snowpack winter. With mild winter conditions, normal spring conditions, and with the numbers from the two previous years, expectations were optimistic for this year's survey. The methods for conducting lek searches were refined from the first year of surveys and personnel were trained. Each region has minor differences that should be considered by the local biologist when conducting lek surveys; however the methods outlined in this report are a culmination of all 5 regions and should be followed when

conducting lek surveys. The coordination of the 2009 effort proved to be difficult due to personnel schedules, weather complications, and movement of equipment, including the helicopter. It was recommended to choose 1 or 2 regions per year and focus the efforts in those regions. Those recommendations were followed in 2010, 2011, and 2012. Survey efforts will rotate through regions until all potential lek sites have been surveyed. This made coordination of the actual flights much more efficient. Protocols were followed and survey results were better in 2010 and 2011 than in 2009. By contrast the 2012 survey yielded a lower return on observations. This decrease in observations is likely due to the region of focus (SR) and to the selected survey sites within the regions surveys. The Southern Region lies at the very extreme of grouse distribution and at the extreme, numbers cannot be expected to be as high as more central areas. The extreme edge of the range makes it all that more important to locate and maintain leks to prevent range contraction. Management at species distribution edges should also account for increased fragmentation and isolation of populations. Following recommendation from last year's effort, this year's survey focused on documenting sage-grouse within mapped undetermined sage-grouse habitat (previously occupied, unknown current status) throughout Utah. Surveyed areas were selected where current information about grouse was available. The new lek searches began with the most likely locations (the "low hanging fruit"), areas with known grouse use. The searches have begun to enter a phase of searching areas of unknown current status but with characteristics of potential habitat or previously occupied, to see if they are in fact there.

The discovery of new leks is critical for management of the species. This year's survey did not include areas of Gunnison sage-grouse, but Utah DWR will continue its efforts and resources for the management of Gunnison sage-grouse. The financial cost of sage-grouse lek searches is high, especially when viewed from a cost per observation perspective. However, the benefits of locating and tracking new populations and leks are also high. The cost per observation (\$2567.75/sighting) was increased from 2011 (\$989/sighting) and 2010 (\$739/sighting), and approaching the cost in 2009 (\$2991/sighting). This initial decrease followed by an increase is expected as the first year often includes logistical challenges to conducting the survey ("the learning curve"). As the surveys progress, the first new leks found are often the easiest to find and it becomes more and more challenging to locate new leks and grouse. Funding of ground surveys is also high, due to greatly reduced efficiency and cost of personnel and vehicles. This reduced efficiency makes aerial surveys the more appropriate approach, as ground surveys would not yield the needed amount of information. A purely cost per observation analysis does not accurately reflect the importance of the information gathered. With the increasing attention on sage-grouse management and populations, the need for complete and accurate population data is vitally important to impede a listing under the Endangered Species Act. Utah will have a more accurate picture of the sage-grouse resource when a complete survey of all potential lek habitats is completed.

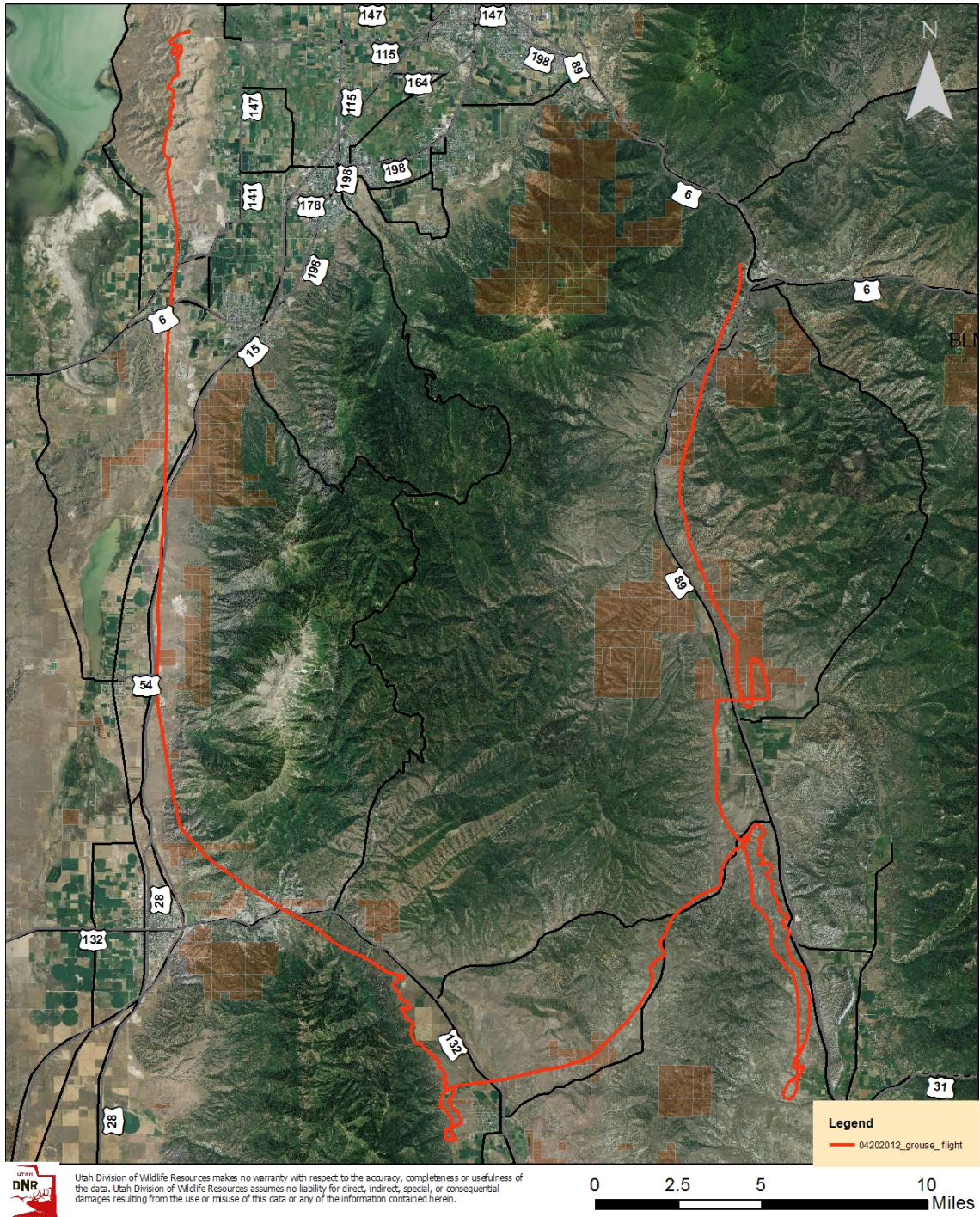
Multiple potential new leks have been identified through this effort. While only one potential new lek was located in 2012 (strutting males), the survey has produced new lek locations in other years and is expected to continue adding new locations in the future. One new lek was confirmed in the 2010 survey effort. Six new potential leks were

discovered in the 2011 survey efforts. By definition of the Utah Greater Sage-grouse Management Plan 2009, a lek is not official until 2 or more sage-grouse males are seen in the same location for 2 or more years. No sightings in 2009 were of strutting males; however several sighting in 2010 and 2011 were of strutting males. Local biologists went back to the location, if possible, to determine if the sighting was a new lek. It will take several years of checking before a determination can be made for certain. One of the primary reasons for conducting aerial surveys is to access lands that are not accessible by vehicles, which complicates the determination of leks. It is our recommendation that this effort continues into the future as long as financial support is available and there are still identified areas within the state that need aerial lek surveys conducted, as the management benefits outweigh the financial costs.



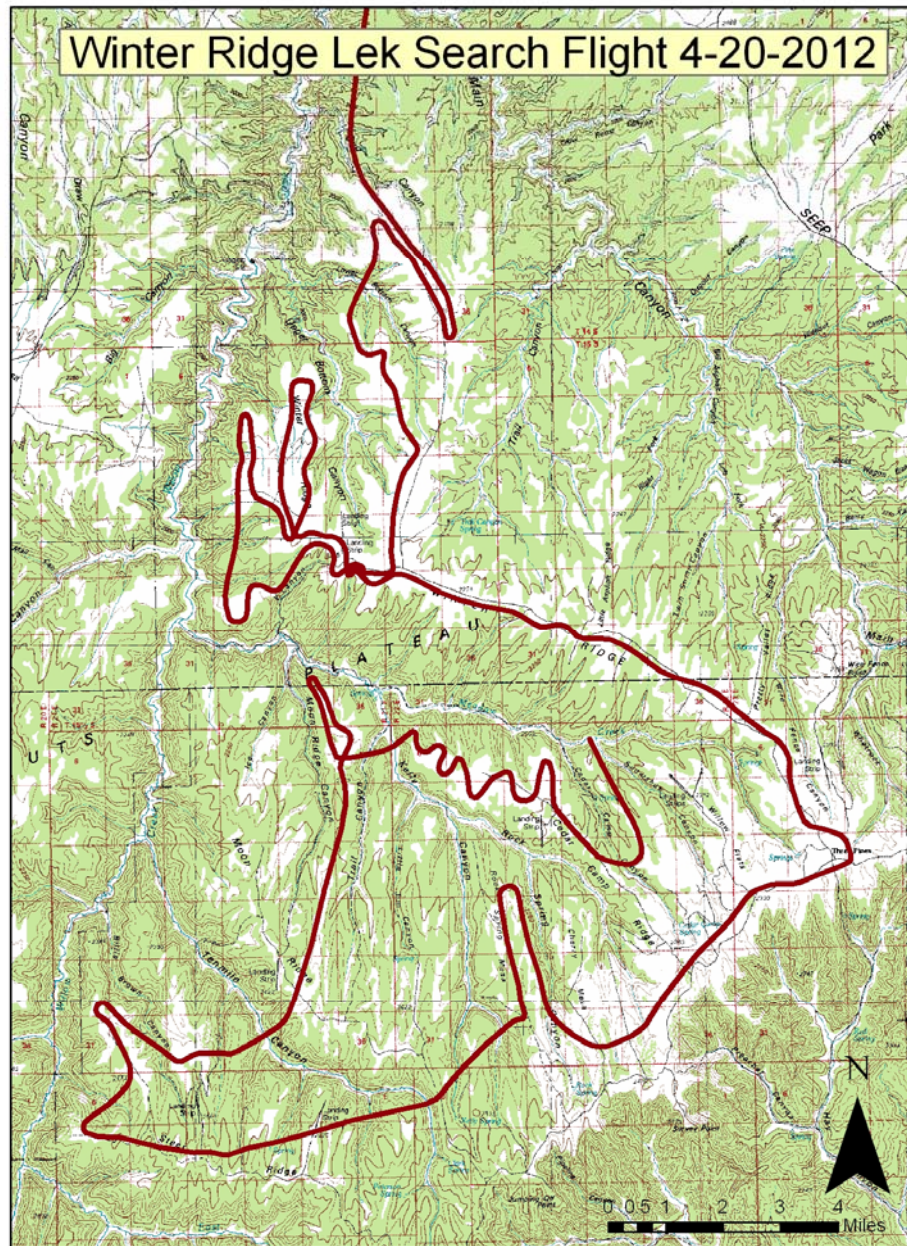
**Figures 1-6 (Pages 8-13):** Lines are the flight path of the helicopter; locations where greater sage-grouse, male or female, were seen from the helicopter are noted on each map. The locations were later visited by local biologist to validate a possible lek.

## Central Region Sage Grouse Flight 04202012



**Figure 1: Flight path of San Pete in the Central Region.**

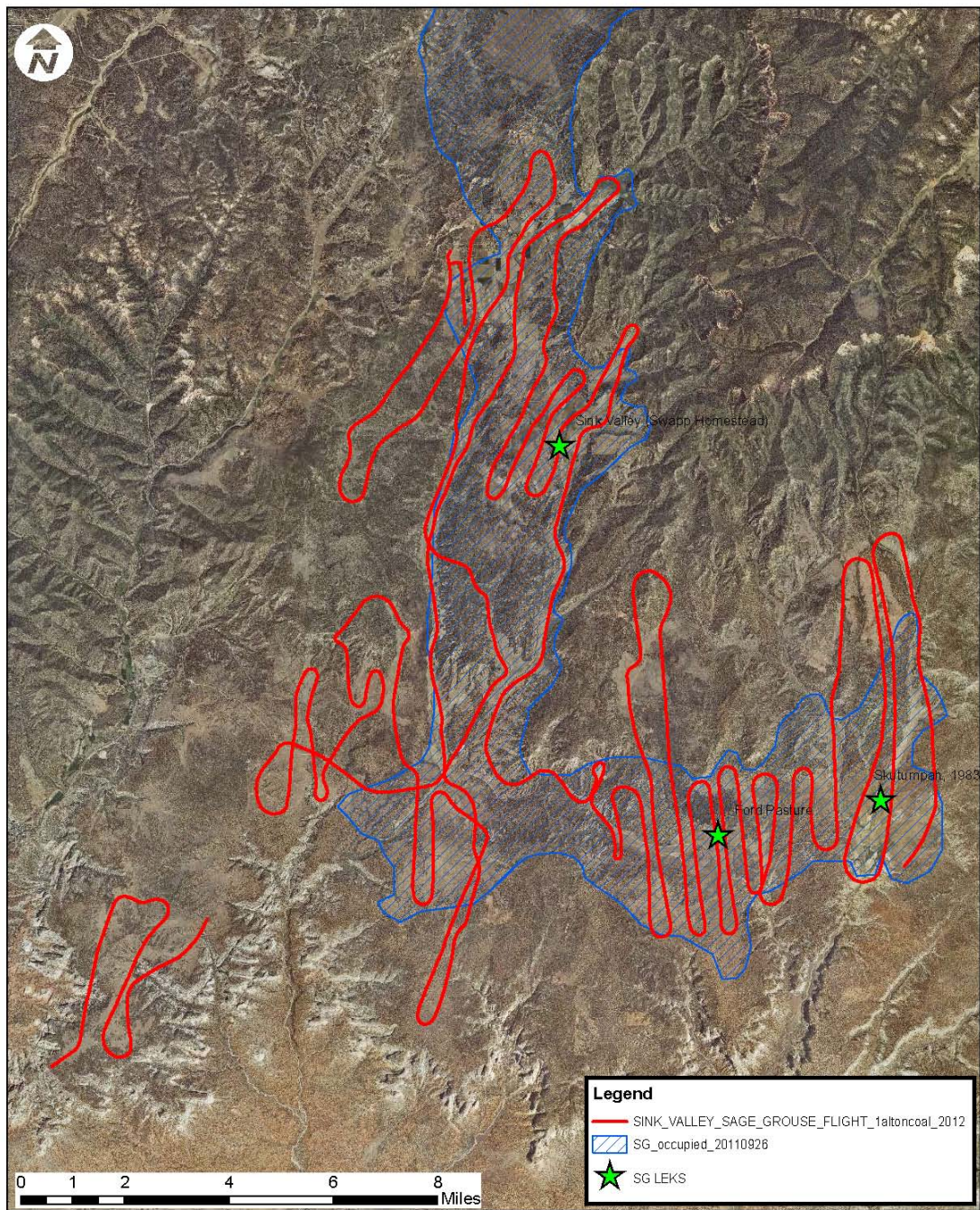




**Figure 2: Flight path of Winter Ridge in the Northeast Region.**



## UDWR/Alton Coal Sage Grouse Flight 3-15-2012



**Figure 3: Flight path of Alton Coal #1 in the Southern Region.**

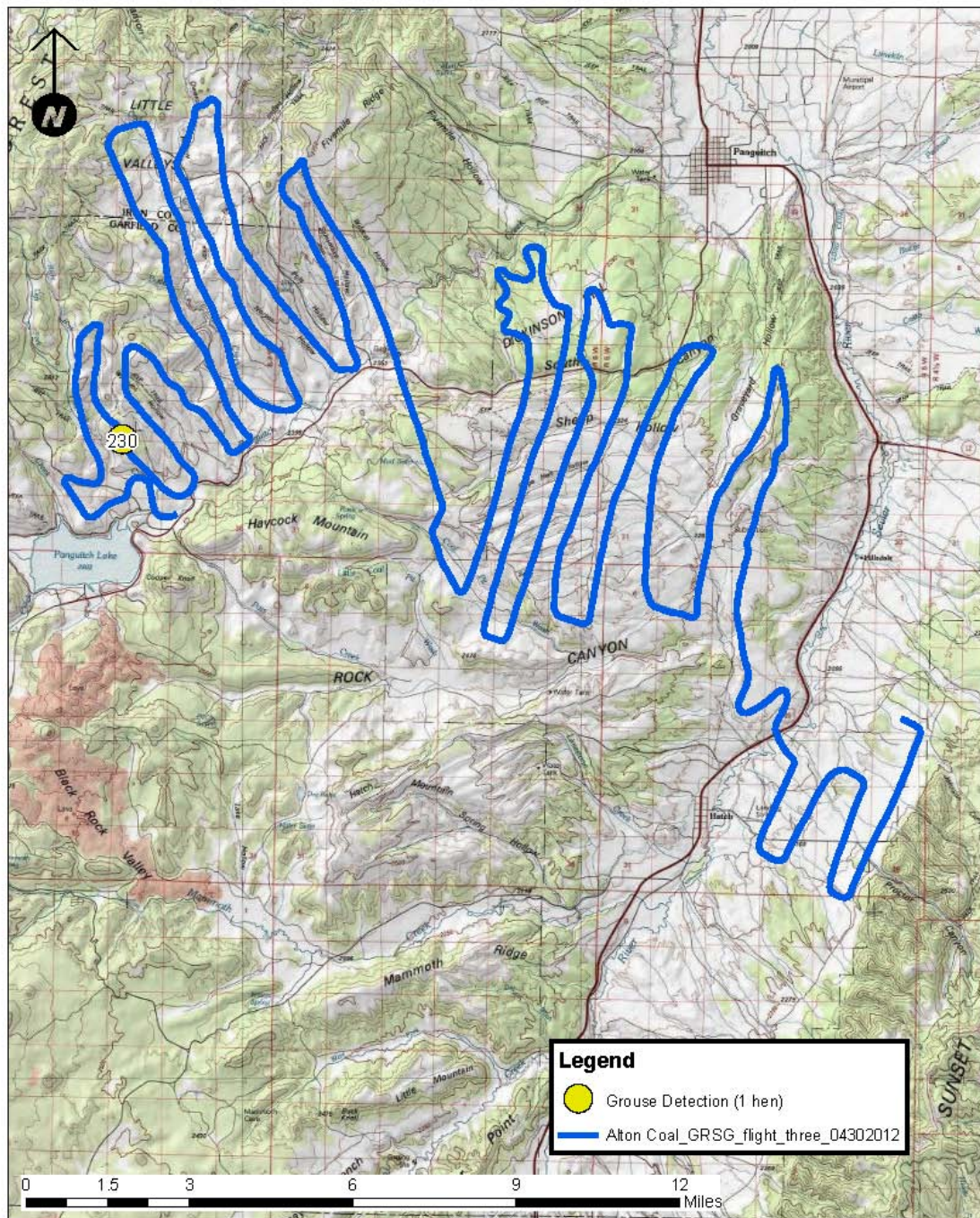


This topographic map displays the Alton Coal field area, characterized by rugged terrain with numerous peaks and valleys. A prominent blue line traces a flight path, starting near the top center and extending downwards with several loops. Yellow circular markers with black numbers indicate grouse sightings at locations 225, 226, 227, 228, and 229. The map includes a north arrow in the upper left corner and a scale bar at the bottom left, ranging from 0 to 12 miles. A legend in the bottom right corner identifies the yellow circle as 'Grouse Sightings' and the blue line as 'Alton Coal\_flight\_two\_04092012'. Various geographical features are labeled, including 'Dixie National Monument', 'Pink Canyon', 'Sagehen Canyon', and 'Dixie National Forest'. The map also shows a grid of latitude and longitude lines.

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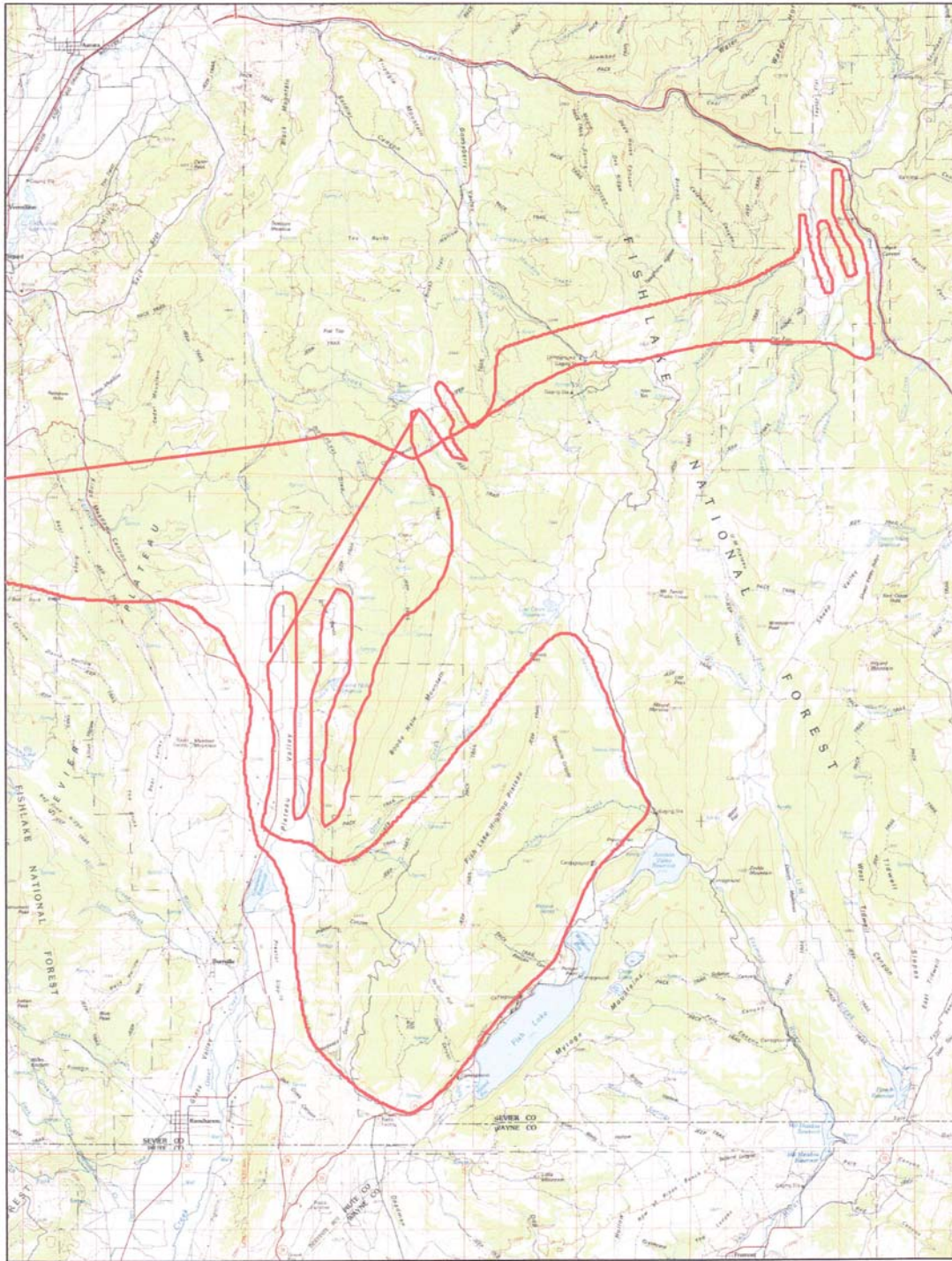


## Alton Coal Grouse flight #3 - April 30, 2012



**Figure 5. Flight path of Alton Coal #3 in the Southern Region.**





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**Figure 6. Flight path of Johnson Ranch in the Southern Region.**