2023 Utah Greater Sage-grouse Lek Count Report

Lek Counts
Adaptive Management Triggers
Aerial Search

Utah Division of Wildlife Resources.
November 2023

Abstract:

Greater Sage-grouse (Centrocercus urophasianus) lek counts are conducted annually within Utah with a goal of counting the peak number of males on all known leks in the state. Statewide lek counts within Sage-grouse Management Areas (SGMAs) were up 2.5% from 2022 counts, with 2985 male sage-grouse counted on 176 leks within SGMAs. During the lek counting period there was limited access due to above average snowpack, so even a slight increase in counts is a positive result. Counts relative to the previous year are inconsistent across the state with four SGMAs having increased counts, seven declining and one with no change. An additional 132 male sage-grouse were counted outside of SGMAs for total of 3117 male sage-grouse counted state-wide. Statewide 338 leks were counted at least once with males observed on 189 leks.

The Utah Bureau of Land Management and US Forest Service resource management plans contain a set of adaptive management triggers developed and evaluated in conjunction with the Utah Division of Wildlife Resources. In 2023, continued negative population growth resulted in a Hard Trigger in the Hamlin Valley Federal Population Area.

Systematic greater sage-grouse aerial lek searches are scheduled annually to document new or previously unknown leks. Surveys are conducted by a contractor using infrared (IR) imaging from a fixed wing aircraft. Surveys were conducted in the Panguitch, Hamlin Valley, Bald Hills and Parker Mountain-Emery SGMAs.

Background:

Sage-grouse life history is tightly woven around leks and leks are a visible center of important sage-grouse habitats. Leks are associated with critical nesting and early brood-rearing habitats, and generally located within nesting habitat used by nesting sage-grouse hens, with the majority of nesting within 3.1 miles of a lek. Annual counts of male sage-grouse on leks has been shown to accurately reflect population changes (Dahlgren et al. 2016). The effectiveness of lek counts as population index and relative ease of data collection leads to lek counts forming the basis of most sage-grouse management and population monitoring.

Greater sage-grouse (*Centrocercus urophasianus*) leks have been counted in Utah for over half a century, and the Utah Division of Wildlife Resources (DWR) maintains lek records extending back to 1959. The DWR focused tremendous energy and resources into locating sage-grouse leks and defining populations during the 1960s and 1970s. Records of lek locations and counts form one of the most extensive and continuous monitoring systems for this species across its range. While ground searching for new leks continues, the majority of work is directed toward monitoring known leks.

Over the time period for which data is available, there is a consistent cyclic behavior with a peak and trough every eight to 10 years. Since 1959, we have seen an increase in the

number of sage-grouse counted in Utah, however the raw counts are confounded by increasing levels of effort counting known leks and searching for unknown leks. To compensate for additional effort increasing total male counts, average males per lek is also calculated to provide an index of population change less impacted by counting effort. However, males per lek also has potential bias as increased search effort is likely to document smaller leks and decrease the average numbers of males per lek. Despite some bias in metrics, overall trend in lek counts is closely correlated with trends in populations. Lek counts accurately represent changes in sage-grouse populations over time.

Range wide loss of sagebrush habitat and concomitant decreases in populations have led to a number of petitions for listing under the Endangered Species Act. Greater sage-grouse were found warranted but precluded from listing in March of 2010, then in in October of 2015 were found not warranted for listing. However, they are still vulnerable to habitat loss and other factors and remain a species of greatest conservation need (SGCN; Utah Wildlife Action Plan). As a SGCN considerable management time, effort, and funding is dedicated to the conservation of greater sage-grouse.

Although tremendous effort has been invested in lek searches, many areas of the state are relatively poorly surveyed for the existence of sage-grouse leks. Leks also have the potential to shift locations over time in response to habitat and population changes, making continued lek searches necessary for ongoing monitoring of sage-grouse populations. Ground searches are conducted by Division employees, researchers, agency partners, private landowners, and others. New leks found via ground-based searches are incorporated into the state lek database as an active lek once reported and verified in a second year.

In addition to ground-based searches, aerial lek searches have enabled a more systematic search for leks in remote and poorly accessible areas throughout the state. Aerial searches allow leks to be found in remote areas, in areas with impassable roads, or areas that are otherwise inaccessible. Aerial searches also allow a large area to be surveyed more thoroughly than is possible via ground-based searches. Aerial surveys also eliminate the time necessary to obtain permission to access private lands or other limited access areas.

Goals and Objectives:
The goal of this project is to maintain monitoring continuity of sage-grouse leks in Utah, and to inventory sage-grouse habitat in the state to expand the lek database and mapping record.

The Utah Greater Sage-grouse Management Plan 2009 states as an objective with related strategies, 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.
    1. Annual lek surveys will form the base metric to determine and assess both annual and long term population status and trend.

2. Strive to survey all known, occupied and active, leks annually utilizing standard UDWR protocol.
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:

Greater Sage-grouse Lek Counts:

Greater sage-grouse lek counts are conducted in accordance with the protocol outlined in the 2009 Management Plan for Greater Sage-grouse in Utah, and the 2022 WAFWA Sage-grouse Monitoring Guidelines. The methods specify that a minimum of three counts at approximate weekly intervals be conducted at each known lek between March 20 and May 7. First counts are conducted in March or early April, depending on conditions to capture maximum male attendance which generally occurs mid-April, however date of maximum counts varies throughout the state. Counts are conducted from ½ hour before sunrise up to 1 ½ hours after sunrise. Sage-grouse are counted from a vehicle or on foot at sufficient distance to not disturb lekking activity. At each visit the lek is counted a minimum of three times in succession using binoculars or a spotting scope. For each count, the time and number of male, female and unknown sex are recorded. Additional data on weather conditions and count location is recorded for each visit. Data is recorded digitally using an ArcGIS Survey123 app on a smart phone or tablet. See the 2009 Management Plan for Greater Sage-grouse in Utah for detailed protocol.

At the close of the lek counting season, data is compiled at the DWR state office where the counts are incorporated into the long-term sage-grouse database.

Undetermined leks have had displaying males observed, but they were either discovered this year, seen in previous years without males being documented in subsequent years, or had only one male observed. Undetermined leks are included in summary statistics.

The 2019 Utah Conservation Plan for Greater Sage-grouse in Utah specifies that population areas are evaluated using the slope of a linear regression line fitted to the most recent 20 years of data. The slope of the regression line represents the number of male sage-grouse added or lost from counts per year over the 20 year period. Results in this report are also presented as an annual percent population change over the 20 year evaluation period. Percent change is calculated as the slope of the regression line divided by the average number of male sage-grouse counted over the same period, multiplied by 100.

Fixed Wing Infrared Lek Search:

Flight areas are prioritized based on known populations, past flight paths, state and regional priorities, data needs for state sage-grouse conservation efforts and flight cost.

Transects were flown by Owyhee Air Research using a cryogenically cooled thermal imager mounted in stabilized gimbal mounts on fixed wing aircraft. Flights are conducted

during morning periods from ½ hours before sunrise to 1 ½ hours past sunrise with weather conditions as specified in the Utah Lek Count Protocol. Polygons of the search area was provided to Owyhee Air Research who develops the flight plan and aircraft path within the specified polygon. Transects are flown at approximately 450 meters above ground level with and camera angle set to a predetermined tilt and zoom allowing for an approximately 500 meters swath of video coverage per pass. The pilot is responsible for flying pre-determined transects with a separate thermography specialist responsible for analyzing the video feed and operating the camera. Once detected along the transect, the aircraft orbits the detected grouse to view the potential lek from all angles, identify grouse to species, count number of birds, identify sex, and record the lek location. Flight data is entered into an excel spreadsheet and probable leks added to the internal DWR sage-grouse databases.

Results: Greater Sage-grouse Lek Counts

In Utah's Sage-grouse Management Areas, 311 greater sage-grouse leks were visited and 176 of those leks had at least one male counted. Across all leks counted within SGMAs there was a high count of 2,985 males, for an average of 17.0 males per lek (Figure 1).

Statewide a total of 338 greater sage-grouse leks were visited. Of the leks visited, 189 had at least one male counted. Across all counted leks where sage-grouse were detected there was a high count of 3,1171 males, for an average of 16.5 males per lek.

Within SGMAs, 17 leks counted were classified as undetermined. These undetermined leks contributed 168 males to the total count. There were no male sage-grouse counted on undetermined leks outside of SGMAs.

Overall counts on SGMAs were up 2.5% from 2022. Total counts were expected to continue increasing in 2023 after a nadir in the cyclic population counts in 2019-2021. Above average snowpack limited access to sage-grouse leks during the spring counting period, counts may have been higher without restricted and late access to some leks. Counts relative to the previous year are inconsistent across the state with four SGMAs having increased counts, seven declining and one with no change.

The peaks and lows continue to decrease with each cycle of the populations – the low years are lower and the high years do not reach the previous peaks. Previous low years in 2002, 2011 and 2019 had 3,034, 2,710 and 2,094 males counted respectively. At the same time, Utah increased counting effort visiting 192 leks in 2002, 266 leks in 2011, 305 in 2019, and 379 in 2022. Effort is increasing over time; with accompanying decrease in males per lek and total males; with equal effort across years we would likely see a steeper decline in long-term sage-grouse counts (Figure 2).

Individual SGMA populations are more variable than the statewide aggregation of counts (Table 1). Population trajectories for individual SGMAs are described below.

Figure 1. Total high count for all Sage-grouse Management Areas within Utah over the past 20 years and males counted per lek for leks with males present. The trend line is fitted to total males counted and represents an overall annual change across 20 years to approximate two population cycles.

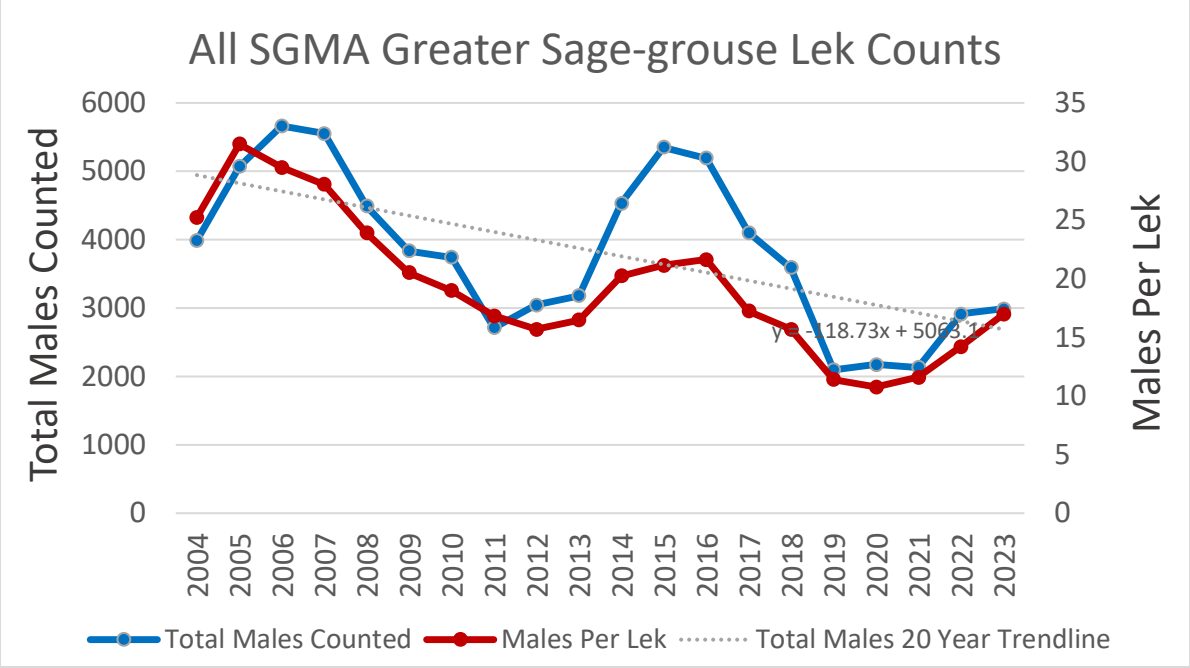


Figure 2. Number of leks visited each lekking season in Utah relative to the total number of males counted. More leks are being counted to maintain the same overall total male counts. Decrease in leks counted in 2023 may be primarily attributable to access limitations resulting from above average snowpack.

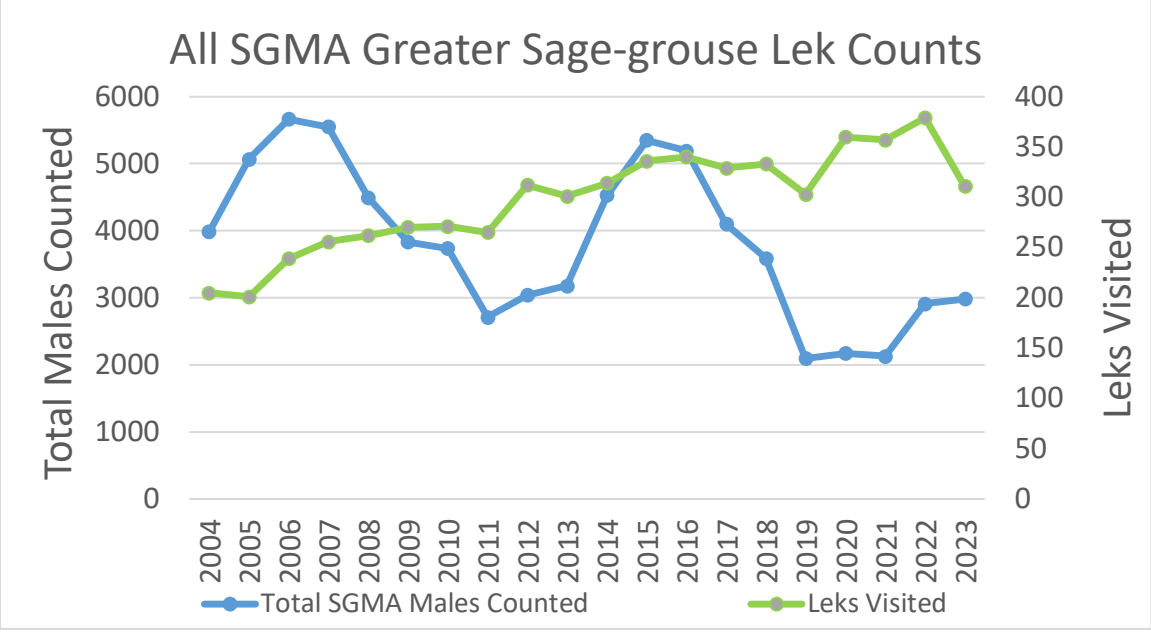


Table 1. Summary data for male greater sage-grouse high counts within each of Utah's Sage-grouse Management Areas and statewide for the 2023 lek counting season. See methods for definitions of fields.

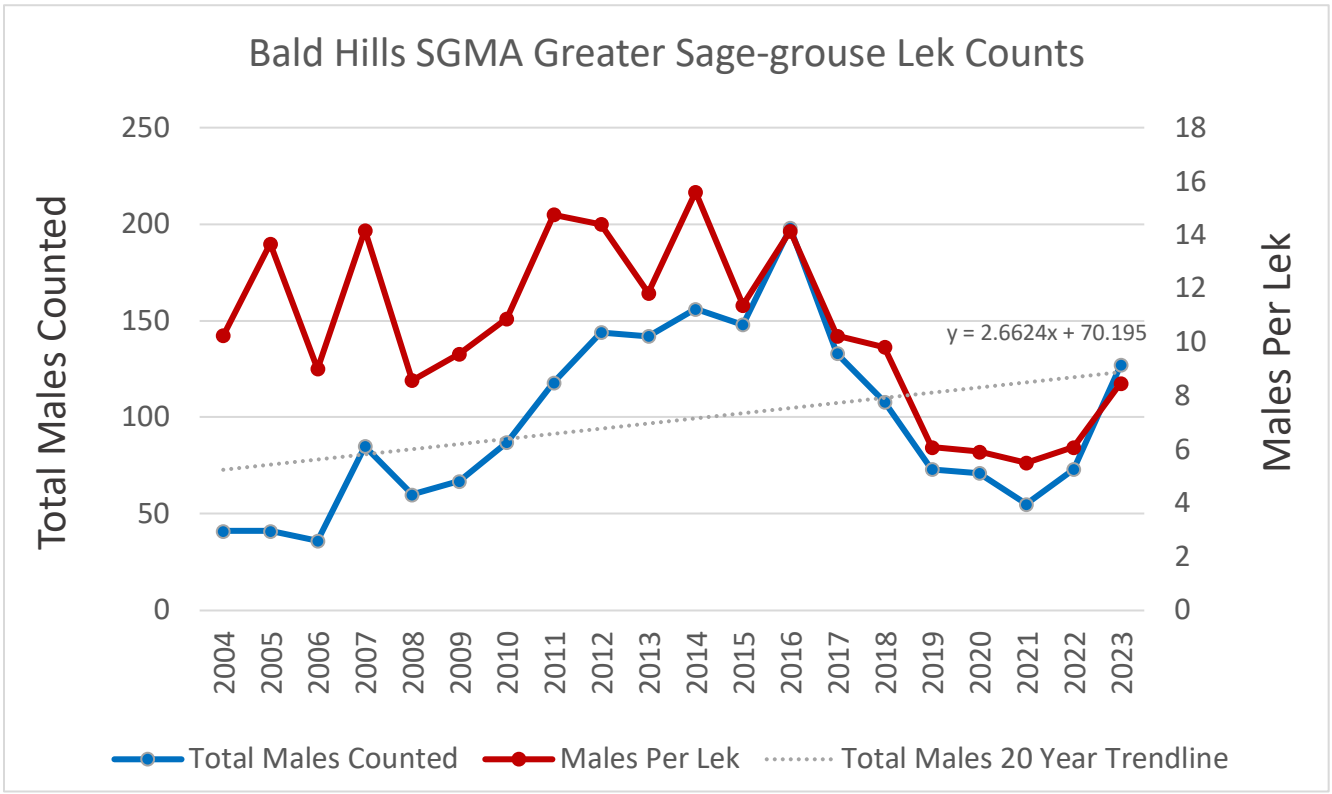
	Leks with Males	Total Leks Visited	Total Males Counted	Average Males per Lek (leks > 0)	Percent Change 2022 to 2023	20 Year Regression Slope (male/year)	20 Year Average Count	% Change Per Year over 20 Years	Undetermined Leks Found	Percent of UT Population
Bald Hills	15	17	127	8.5	74.0	2.7	98.2	2.7	1	4.1
Box Elder	32	61	457	14.3	-8.4	-30.3	653.6	-4.6	1	14.7
Carbon	9	16	90	10.0	-26.2	0.1	135.1	0.0	0	2.9
Hamlin Valley	4	9	38	9.5	-11.6	-3.1	77.8	-3.9	0	1.2
Ibapah	3	4	41	13.7	0.0	-0.4	40.8	-0.9	0	1.3
Panguitch	14	31	189	13.5	-3.6	-7.4	302.6	-2.5	1	6.1
Parker Mountain-Emery	38	73	771	20.3	62.0	-24.4	816.0	-3.0	1	24.7
Rich-Morgan-Summit	23	40	529	23.0	-30.2	-52.1	958.7	-5.4	0	17.0
Sheeprock Mountains	4	9	53	13.3	32.5	-4.6	63.4	-7.3	0	1.7
Strawberry Valley	5	9	93	18.6	-36.3	1.0	101.4	1.0	1	3.0
Uintah	29	42	597	20.6	15.0	-0.2	568.8	0.0	1	19.2
Non-SGMA	13	27	132	10.2	-29.8	-4.0	260.6	-1.5	0	4.2
All SGMA	176	311	2985	17.0	**2.5**	-118.7	3816.4	-3.1	6	95.8
All Leks	189	338	3117	16.5	**0.5**	-122.3	4055.7	-3.0	6	100.0

Bald Hills

In the Bald Hills SGMA 17 leks were visited, of those male sage-grouse were detected on 15. A total of 127 male sage-grouse were counted, for an average of 8.4 males per lek. From 2022 to 2023 the Bald Hills SGMA counts increased by 74%. This annual increase was a welcome reversal of the consistent downward trend from 2016 to 2021, however current counts are still below recent high counts, and similar to the previous low count in 2008.

Overall, counts in the Bald Hills SMGA have trended up over the past 20 years when fitted to a 20 year trend line, at an average rate of 2.7% per year. However, that growth rate is based on counting 17 leks per year in 2023, relative to only 7 leks per year at the beginning of the evaluation period. One potential new lek was found.

Figure 3. Average males per lek for all leks with at least one male counted and total number of males counted within the Bald Hills Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.

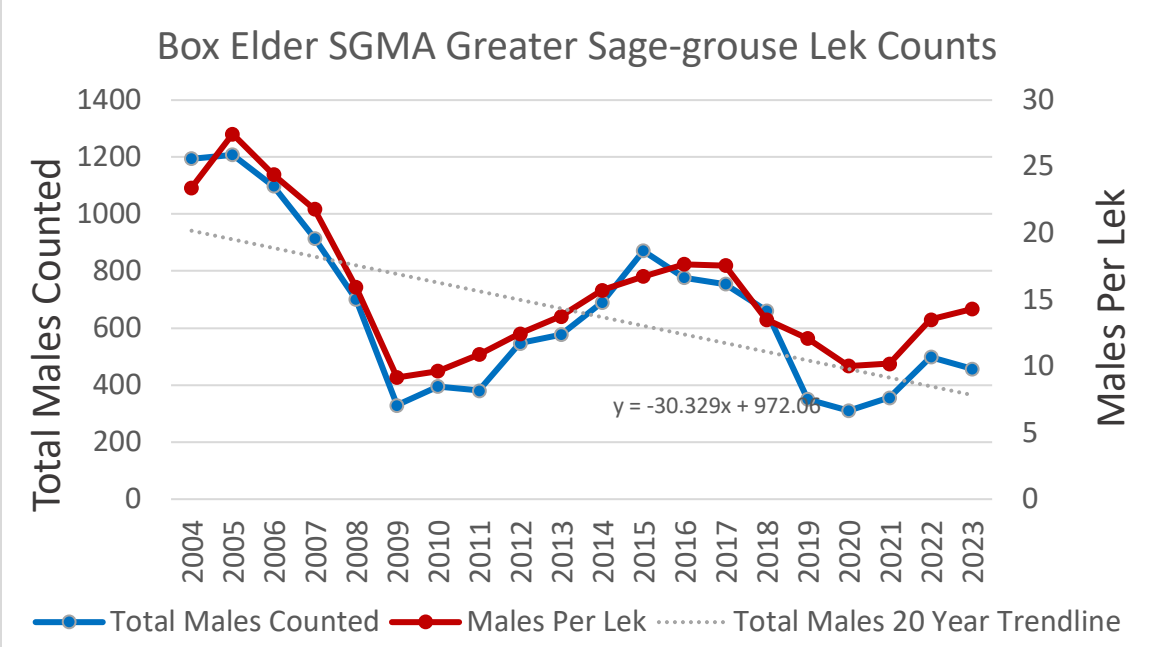


Box Elder

In the Box Elder SGMA 61 leks were visited, of those male sage-grouse were detected on 32. A total of 457 male sage-grouse were counted, for an average of 14.3 males per lek. From 2022 to 2023 the Box Elder SGMA counts decreased by 8.4%. This annual decrease may be impacted by above average snowpack limiting access to may leks until later in the lekking season, and completely precluding counts at others. Counts have trended down over the past 20 years, decreasing at an average annual rate of 4.6% per year.

There has been significant expansion of conifer cover into sagebrush habitat within the SGMA, however large areas of habitat have been restored in the SGMA in recent years. As restoration projects are completed in the area we hope to see an increase in population and a shift to a positive long term trend. One potential new lek was found.

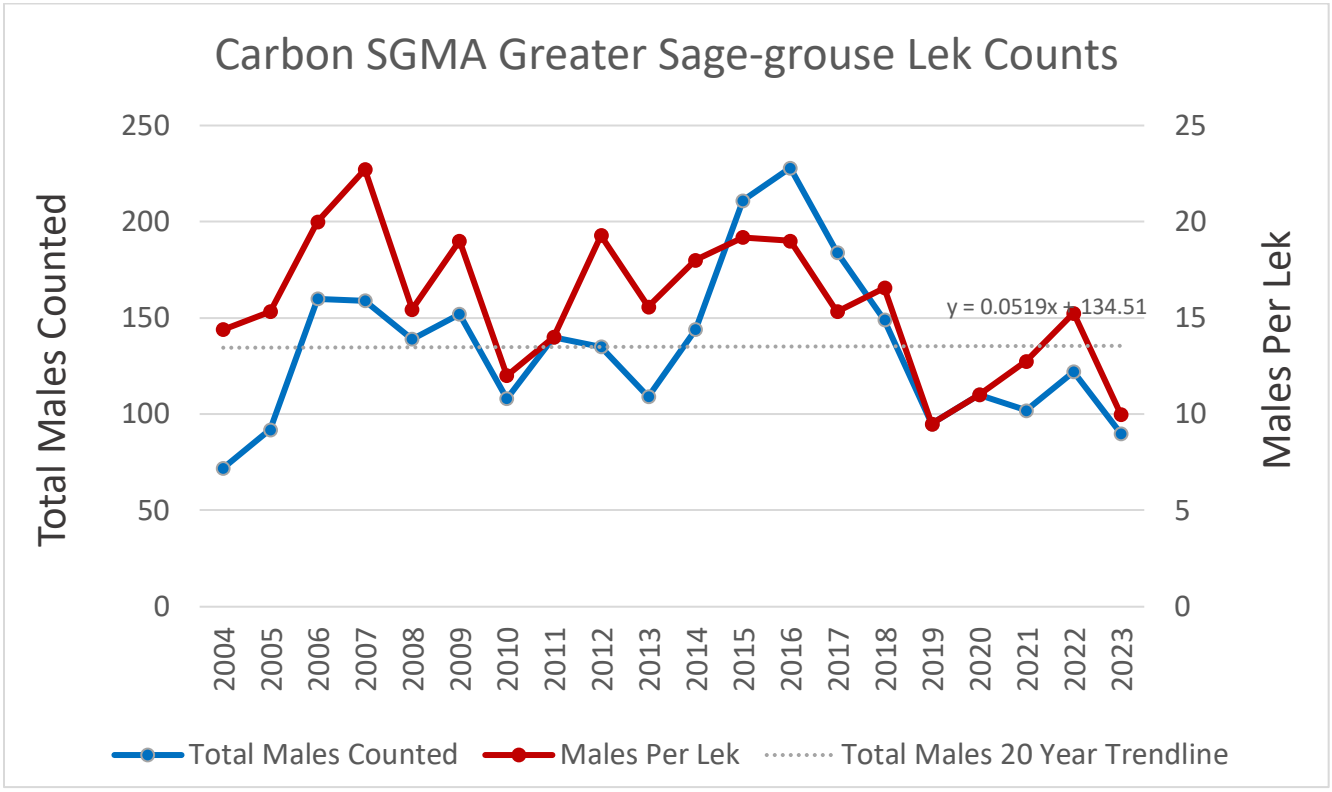
Figure 4. Average males per lek for all leks with at least one male counted and total number of males counted within the Box Elder Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



Carbon

In the Carbon SGMA 16 leks were visited, of those male sage-grouse were detected on 9. A total of 90 male sage-grouse were counted, for an average of 10.0 males per lek. From 2022 to 2023 the Carbon SGMA counts decreased by 26.2%. Counts in the SMGA have been flat over the past 20 years, increasing at an average annual rate of 0.0% per year. No new leks were found.

Figure 5. Average males per lek for all leks with at least one male counted and total number of males counted within the Carbon Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.

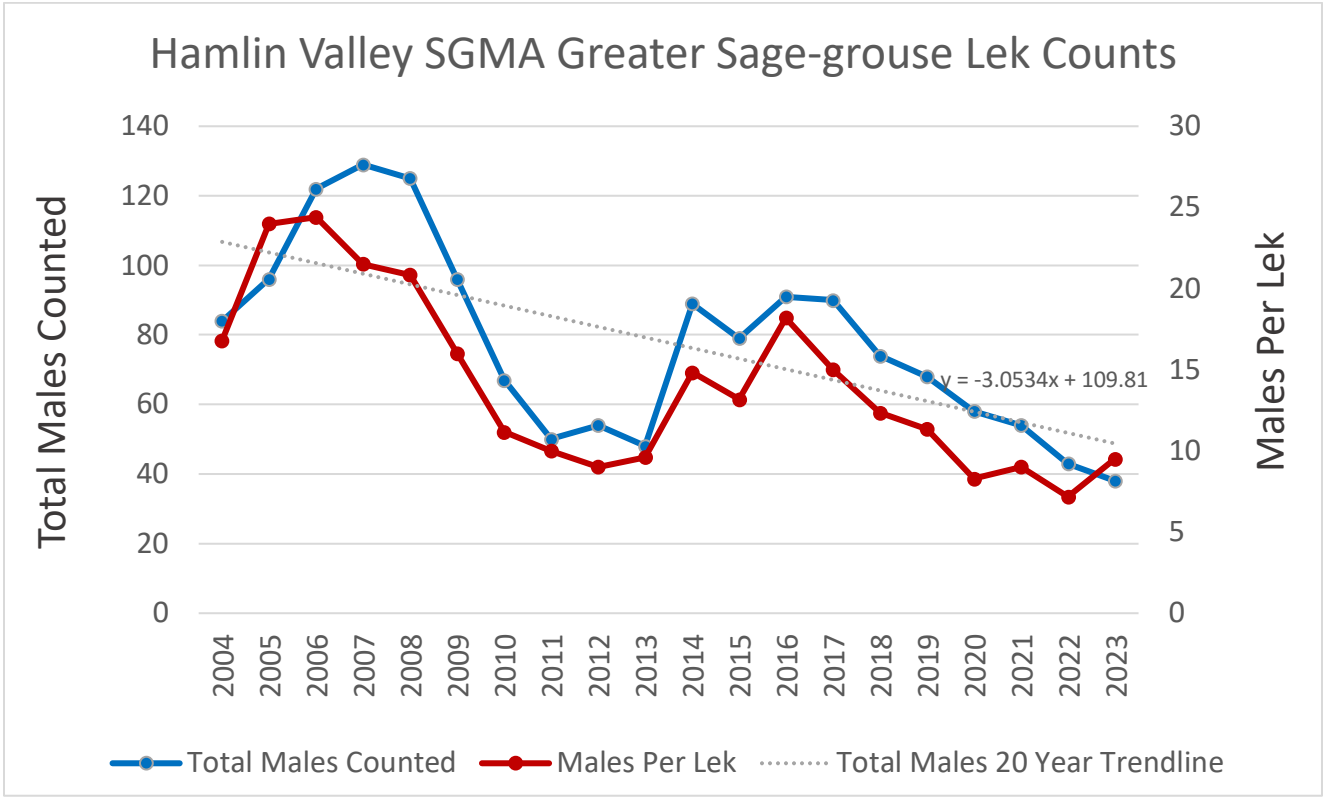


Hamlin Valley

In the Hamlin Valley SGMA 9 leks were visited, of those male sage-grouse were detected on four. A total of 38 male sage-grouse were counted, for an average of 9.5 males per lek. From 2022 to 2023 the Hamlin Valley SGMA counts decreased by 11.6%. This annual decrease does not follow expected population cycles and may be linked to extreme drought reducing survival and reproductive success. Counts in the SGMA have trended down over the past 20 years, decreasing at an average annual rate of 3.9% per year, or an average loss of 3.0 males per year. No new leks were found.

The Hamlin Valley population area met criteria for hard federal adaptive management triggers for a second consecutive year (Table 2). Hard triggers were indicated by lambda of less than one in six consecutive years for all PHMA leks and lambda of less than one in 8 of 10 years for all PHMA leks. Contact the BLM or consult the BLM's causal factor analysis for more information on federal management plan triggers.

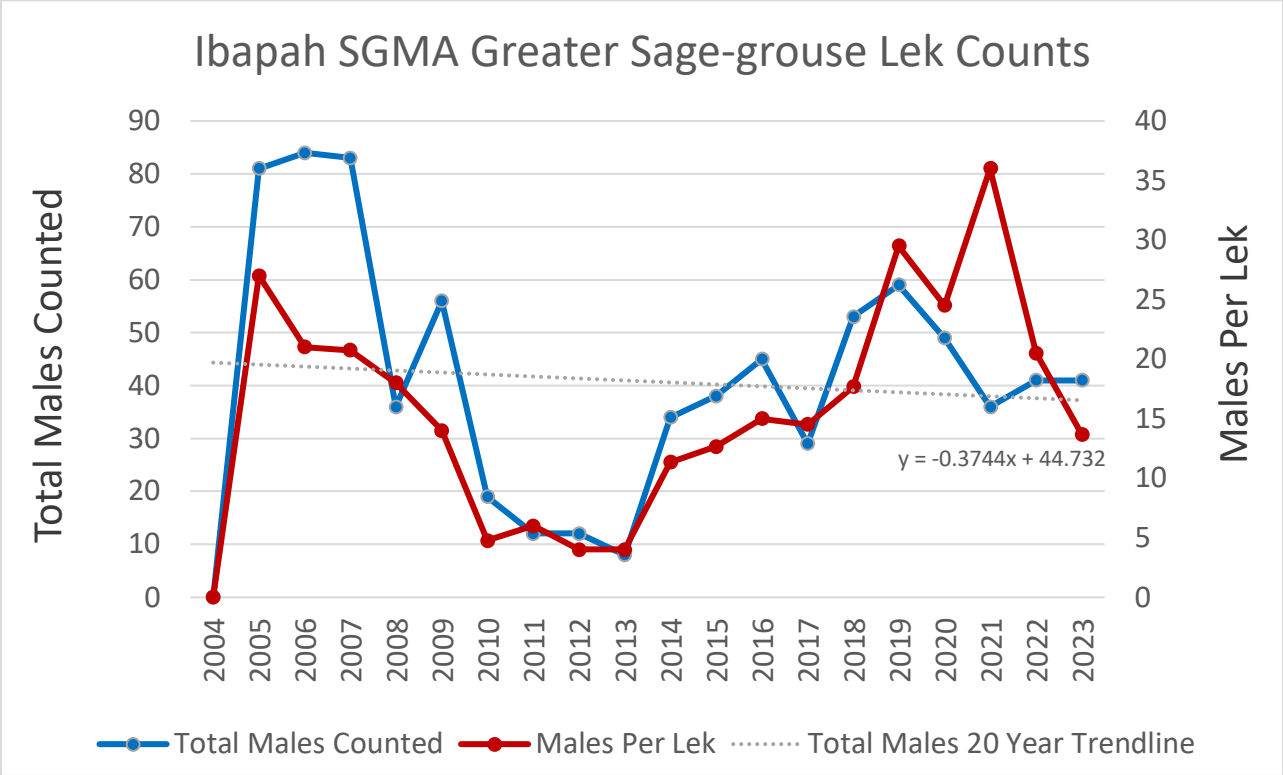
Figure 6. Average males per lek for all leks with at least one male counted and total number of males counted within the Hamlin Valley Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



Ibapah

In the Ibapah SGMA four leks were visited, of those male sage-grouse were detected on three. A total of 41 male sage-grouse were counted, for an average of 13.6 males per lek. From 2022 to 2023 the Ibapah SGMA counts were the same in total number of birds. Annual counts in this area are variable due to limited number of leks in the area. Counts were essentially flat over 20 years with an average annual decrease of 0.9% per year. No new leks were found.

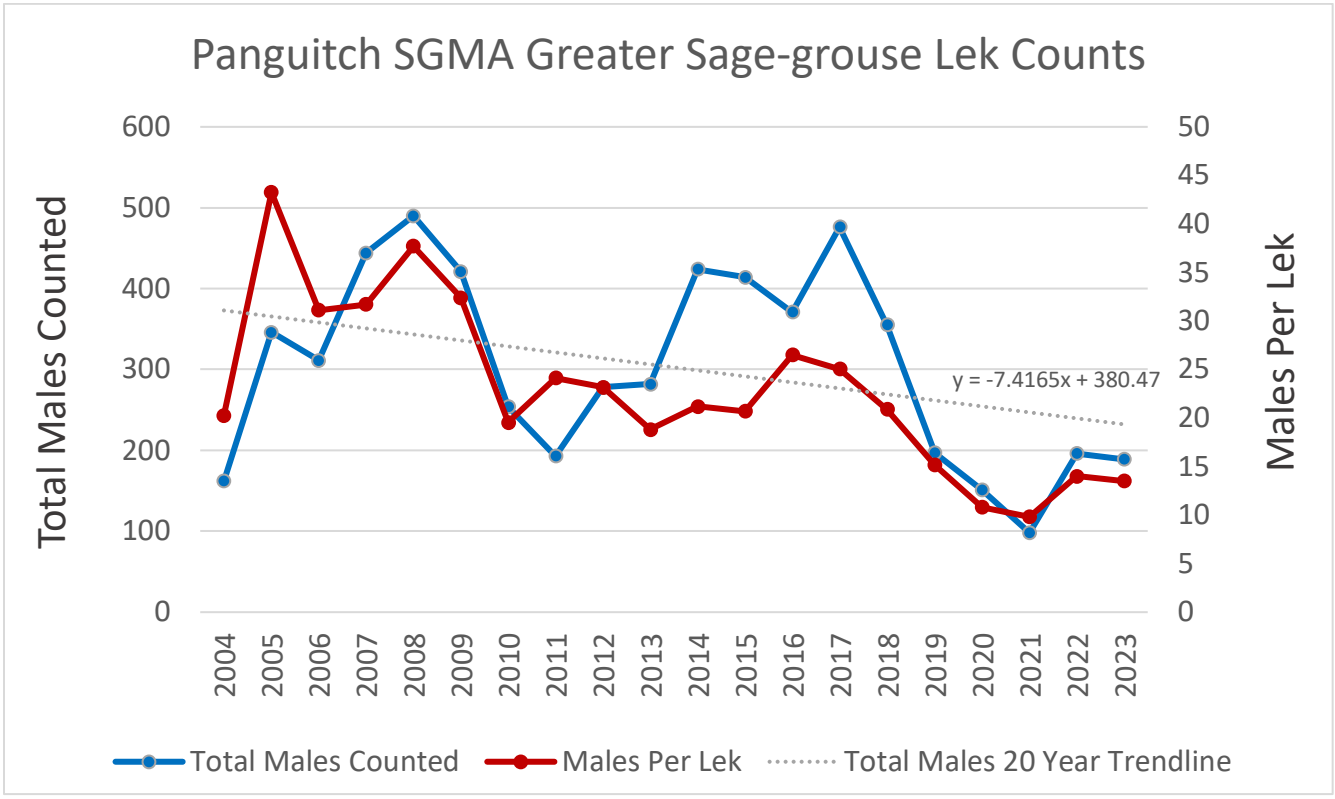
Figure 7. Average males per lek for all leks with at least one male counted and total number of males counted within the Ibapah Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



Panguitch

In the Panguitch SGMA 31 leks were visited, of those male sage-grouse were detected on 14. A total of 189 male sage-grouse were counted, for an average of 13.5 males per lek. From 2022 to 2023 the Panguitch SGMA counts decreased by 3.6%. This lack of population increase following a low in the population cycle and one year of increase may be attributable to limited access and reduced count effort* due to above average snowpack. Counts declined on average over the past 20 years, decreasing at an average annual rate of 2.5% per year. One potential new lek was found.

Figure 8. Average males per lek for all leks with at least one male counted and total number of males counted within the Panguitch Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.

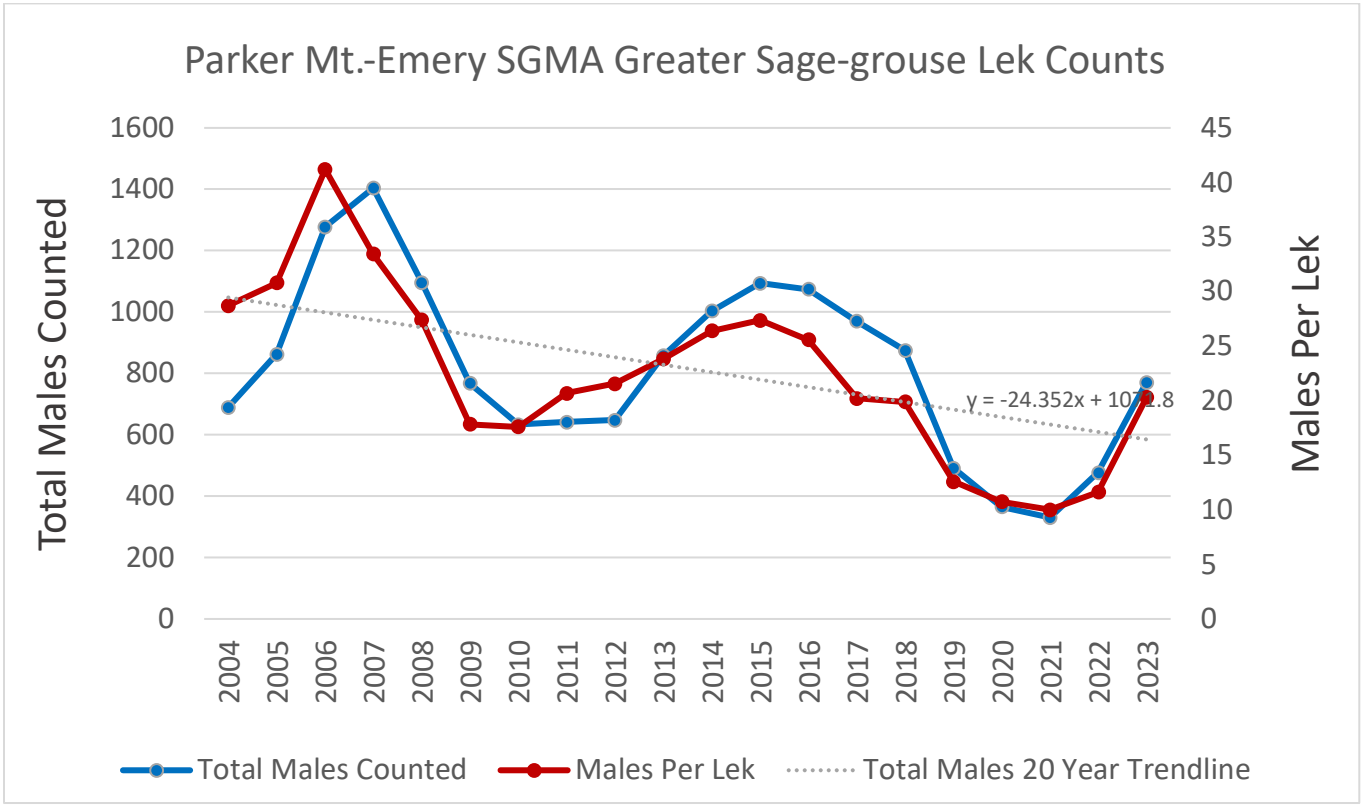


* Effort measured as leks visited. Staff put in significant effort to reach and count leks with poor, late, or no road access.

Parker Mountain-Emery

In the Parker Mountain-Emery SGMA 73 leks were visited, of those male sage-grouse were detected on 38. A total of 771 male sage-grouse were counted, for an average of 20.3 males per lek. From 2022 to 2023 the Parker Mountain-Emery SGMA counts increased by 62.0%. This annual increase following historic low counts brings overall counts back up to levels slightly above the low point in the last population cycle (2010-2012). The SGMA trended down over the past 20 years, decreasing at an average rate of 3.0% per year, or an average loss of 24 males per year from the population. One potential new lek was found, which contributed significantly to 2023 totals with 109 males counted.

Figure 9. Average males per lek for all leks with at least one male counted and total number of males counted within the Parker Mountain-Emery Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



Rich-Morgan-Summit

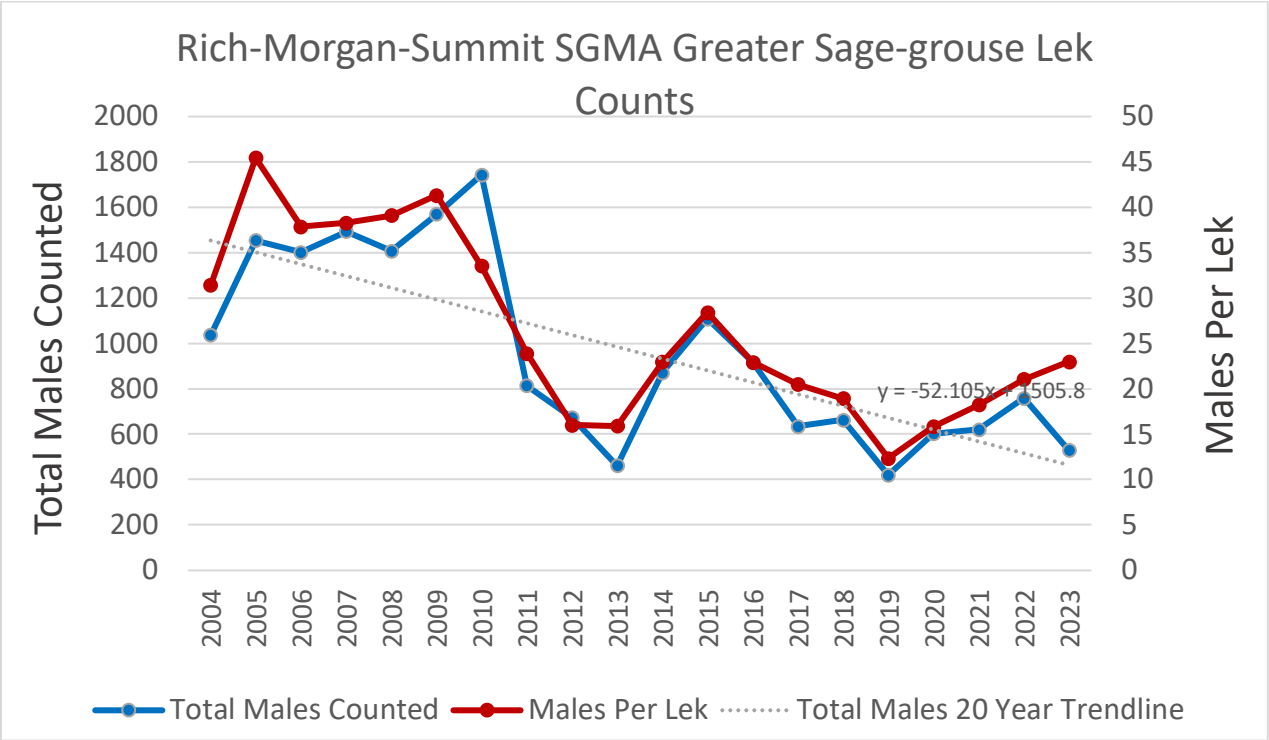
In the Rich-Morgan-Summit SGMA 40 leks were visited, of those male sage-grouse were detected on 23. A total of 529 male sage-grouse were counted, for an average of 23.0 males per lek. From 2022 to 2023 the Rich-Morgan-Summit SGMA counts decreased by 30.2. The SGMA trended down over the past 20 years, decreasing at an average rate of 5.4% per year, or an average loss of 52 males per year from the population.

A decrease in the number of leks counted in 2023, with only 40 visited relative to 51 visited in the previous year, is likely a significant contributing factor to the decline seen in this year's counts. This is one of the higher elevation sage-grouse areas in the state, and access challenges due to above average snow pack were significant. When only counts used for hunting permit calculations are compared, which only includes areas of the SGMA outside of the DLL property, counts were even with the previous year (311 males counted in both 2022 and 2023).

Males per lek increased year over year, continuing an increasing trend that started in 2020, indicating that the population is likely continuing to increase despite low total numbers.

No new leks were found.

Figure 10. Average males per lek for all leks with at least one male counted and total number of males counted within the Rich-Morgan-Summit Sage-grouse Management Area in 2020. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



Sheeprock Mountains

In the Sheeprock Mountains SGMA 9 leks were visited, of those male sage-grouse were detected on four. A total of 53 male sage-grouse were counted, for an average of 13.3 males per lek. From 2022 to 2023 the Sheeprock Mountains SGMA counts increased by 32.5%.

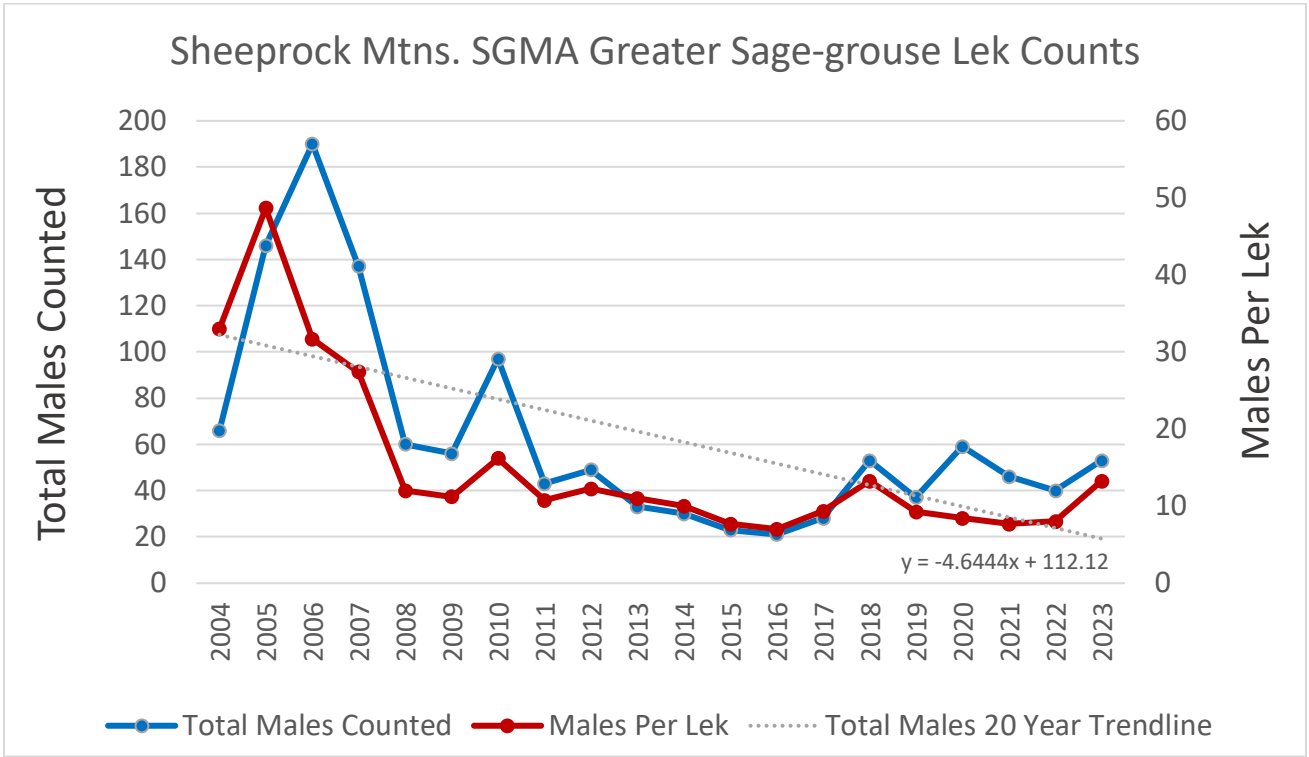
The Sheeprock Mountains SGMA has had long term declines in population and counts are down over the past 20 years, decreasing at an average annual rate of 7.3% per year.

The SGMA has been the focus of intense conservation effort, with habitat restoration, predator control and population augmentation. In 2016, 2017, 2018, and 2019 106 female and 40 male sage-grouse, for a total of 146, were released on active leks in the SGMA.

The overall increase in years after releases is partially attributed to direct additions of males to leks, however the increase is larger than the number of males released indicating there may be a related increase in production within the SGMA.

No new leks were found.

Figure 11. Average males per lek for all leks with at least one male counted and total number of males counted within the Sheeprock Mountains Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.

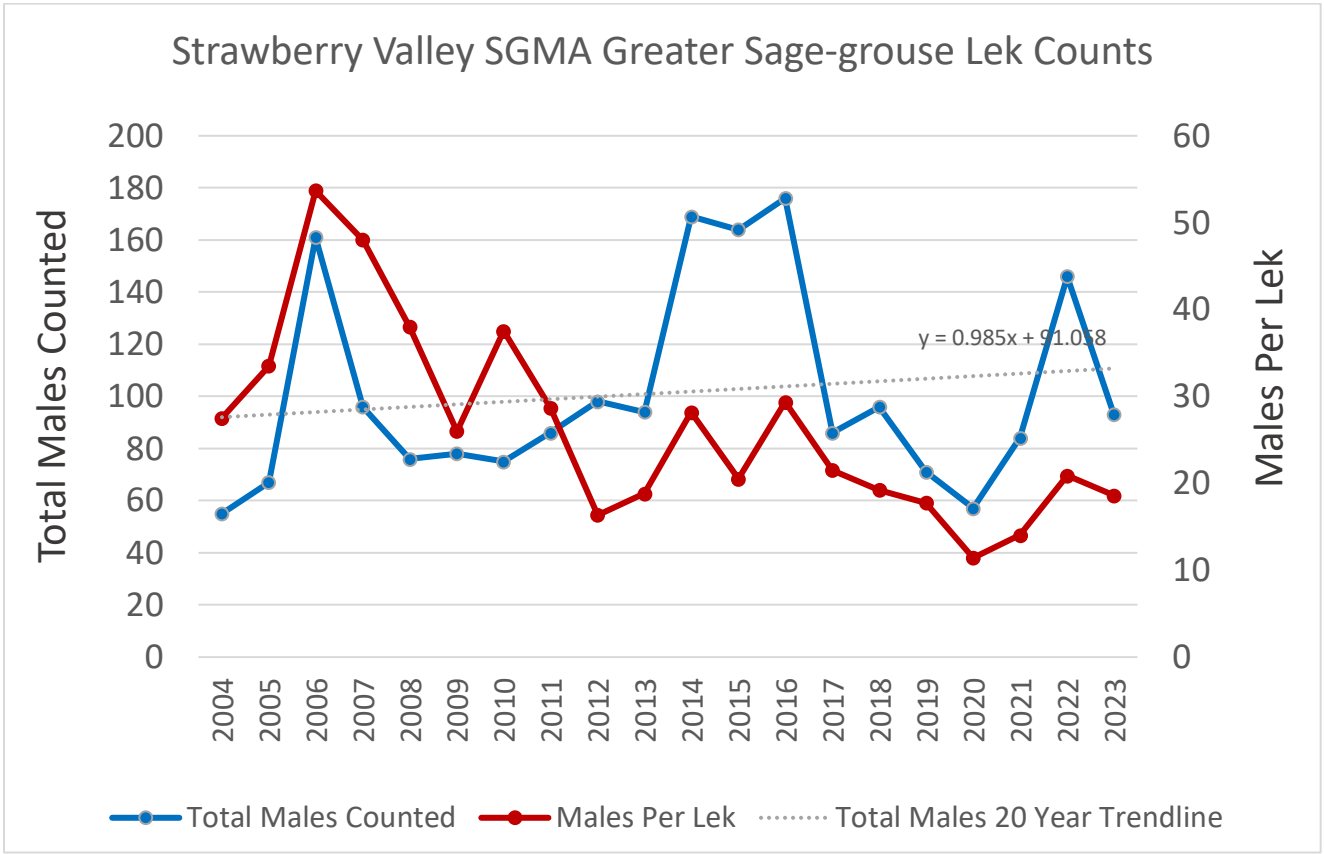


Strawberry Valley

In the Strawberry Valley SGMA nine leks were visited, of those male sage-grouse were detected on five. A total of 93 male sage-grouse were counted, for an average of 18.6 males per lek. From 2022 to 2023 the Strawberry Valley SGMA counts decreased by 36.3%. Generally, counts were up over the past 20 years, increasing at an average annual rate of 1.0% per year. No new leks were found.

Counts were impacted by above average snowpack limiting access to leks and delaying lekking behavior. The decline in total counts is a least partially attributable to reduced access.

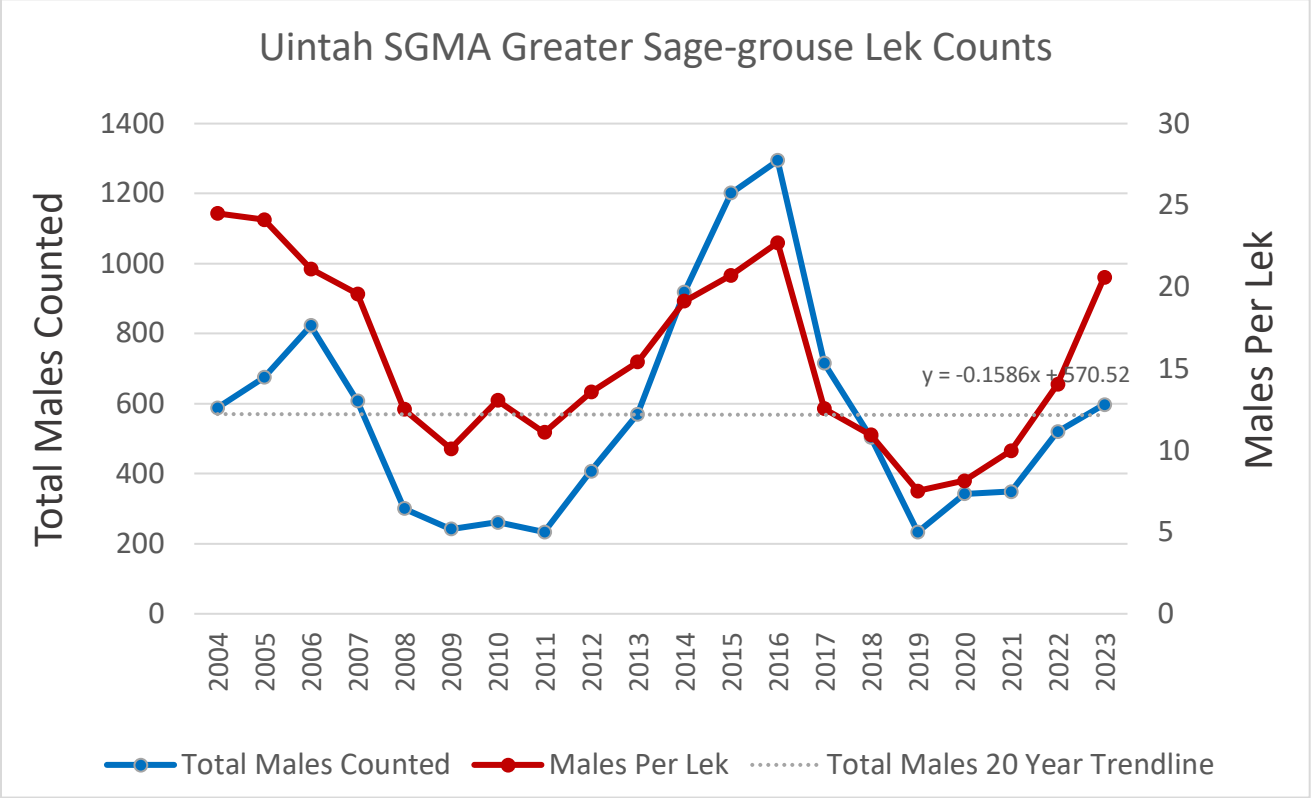
Figure 12. Average males per lek for all leks with at least one male counted and total number of males counted within the Strawberry Valley Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



Uintah

In the Uintah SGMA 42 leks were visited, of those male sage-grouse were detected on 29. A total of 597 male sage-grouse were counted, for an average of 20.6 males per lek. From 2022 to 2023 the Uintah SGMA counts increased by 15.0%. Overall counts are flat up over the past 20 years, increasing at an annual rate of 0.0% per year. No new leks were found.

Figure 13. Average males per lek for all leks with at least one male counted and total number of males counted within the Uintah Sage-grouse Management Area. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.

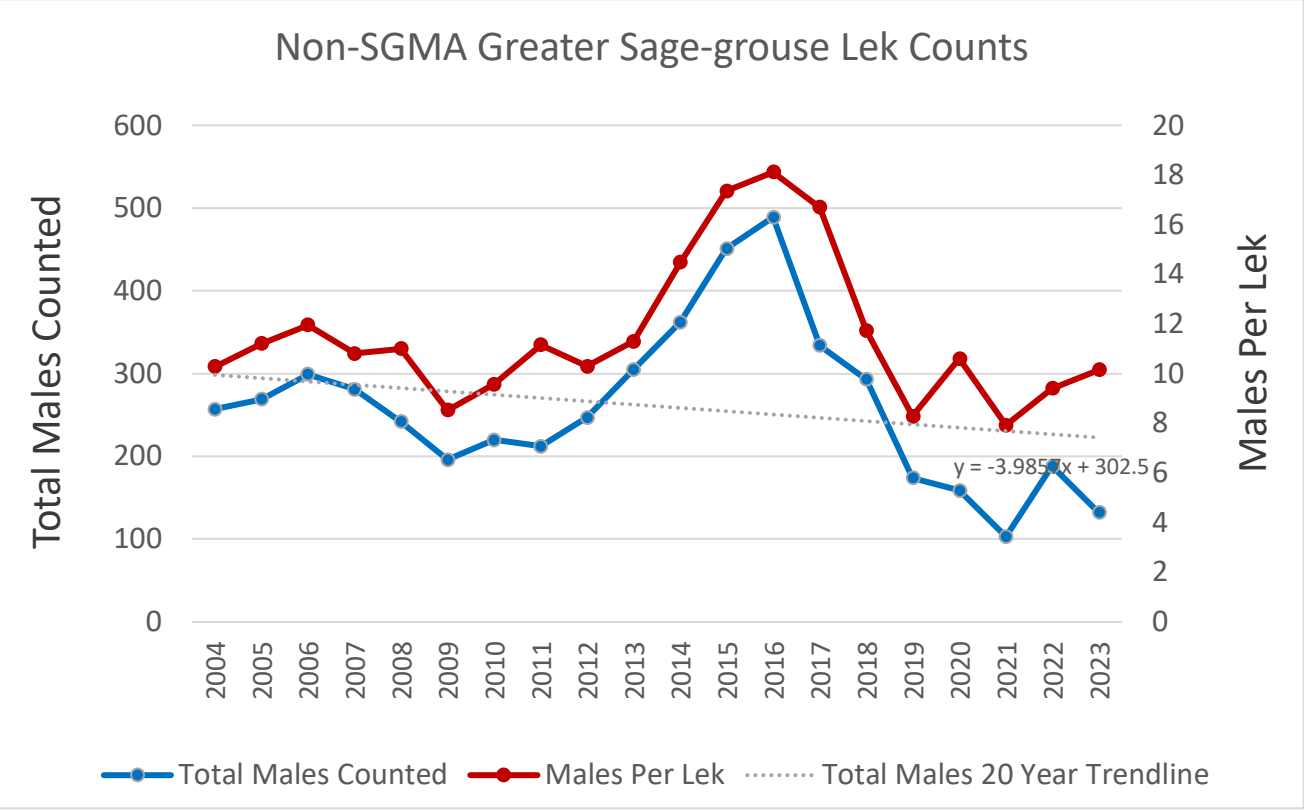


Non-SGMA

Outside of designated SGMAs 27 leks were visited, of those male sage-grouse were detected on 13. A total of 132 male sage-grouse were counted, for an average of 10.2 males per lek. From 2022 to 2023 the Non-SGMA counts decreased by 29.8%. Counts were down over the past 20 years, decreasing at an average annual rate of 1.5% per year.

No new leks were found.

Figure 14. Average males per lek for all leks with at least one male counted and total number of males counted outside of Sage-grouse Management Areas. Trend line represents a linear regression for total males counted over the last 20 year approximating two population cycles.



BLM and USFS Adaptive Management Triggers

The Utah Bureau of Land Management and US Forest Service changes management actions based on a set of adaptive management triggers developed in conjunction with the Utah Division of Wildlife Resources. These adaptive management triggers are based on metrics of males per lek on *trend leks* (MPL) in each federal population area and overall population change (lambda) for all leks within federal Priority Habitat Management Area in each federal population area. It is important to note that the BLM population areas are similar to DWR Sage-grouse Management Areas; however there are differences in area and leks included. The federal plans containing the following adaptive management triggers are included here for informational purposes. The State of Utah continues to manage greater sage-grouse based on the Utah 2019 Conservation Plan for Greater Sage-grouse and 2009 Greater Sage-grouse Management Plan.

Triggers are defined as:

<u>Soft Triggers</u>

1a) 4 consecutive years of 10% or greater annual decline in average males per lek in each year, based on "trend leks"

OR

1b) 6 consecutive years of declining average males per lek in each year, based on "trend leks"

OR

1c) 40% or greater decline in average males per lek in any single year, based on "trend leks" for the 4 years covered by lambda values in soft trigger question 2

OR

1d) 50% or greater decline in average males per lek in a 4 consecutive year period, based on "trend leks"

AND

2) Lambda of less than 1 in 4 consecutive years, based on all leks in the PHMA.

<u>Hard Triggers</u>

a) 4 consecutive years of 20% or greater annual decline in average males per lek in each year, based on "trend leks"

OR

b) Average males per lek, based on trend leks, drops 75% below the 10-year rolling average males per lek in any single year (not a 75% decrease, but a decline under 25% of the 10-year rolling average)

OR

c) Lambda of less than 1 in 6 consecutive years, based on all leks within the PHMA

OR

d) Lambda of less than 1 in 8 years of a 10 year window, based on all leks within the PHMA

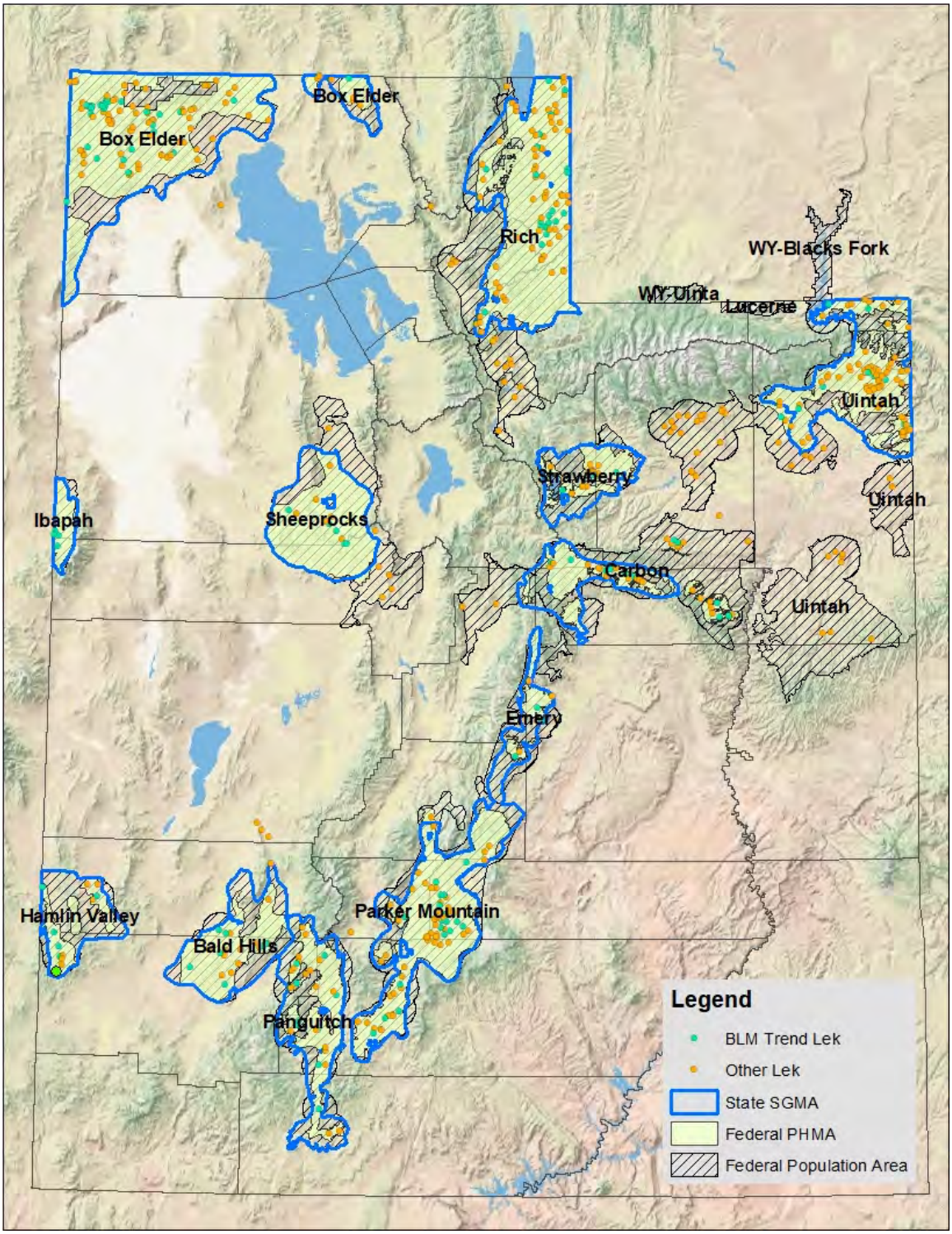
Table 2. BLM population areas and trigger status for 2022 lek counts. Red indicates trigger. Blue indicates no trigger. Lambda is calculated on all leks in PHMA within each population area.

Federal Population Area	Soft Trigger	Hard Trigger	Note
Bald Hills	No	No	Trigger criteria not met.
Box Elder	No	No	Trigger criteria not met.
Carbon	No	No	Trigger criteria not met.
Emery	No	No	Trigger criteria not met.
Hamlin Valley	No	Yes	Hard Trigger: Lambda of less than on in 6 consecutive years (H.c); Lambda of less than one in 8 of 10 years (H.d).
Ibapah	No	No	Trigger criteria not met.
Panguitch	No	No	Trigger criteria not met.
Parker	No	No	Trigger criteria not met.
Rich	No	No	Trigger criteria not met.
Sheeprock Mountains	No	No	Trigger criteria not met.
Strawberry Valley	No	No	Trigger criteria not met.
Uintah	No	No	Trigger criteria not met.

Table 3. A history of federal population adaptive management triggers. Red indicates a hard trigger. Orange indicates a soft trigger. Yellow indicates one of two need criteria for a soft trigger was met, but a trigger was not indicated. OK = No Triggers, OK (W) = Warning without trigger, S = Soft Trigger, H = Hard Trigger.

	2016	2017	2018	2019	2020	2021	2022	2023
Bald Hills	OK	OK	OK	OK (W)	OK (W)	S, H	OK (W)	OK (W)
Box Elder	OK	OK	OK	OK (W)	OK (W)	H	OK	OK
Carbon	OK	OK	OK	OK (W)	OK (W)	OK (W)	OK (W)	OK
Emery	OK	OK	OK	OK (W)	S	OK (W)	OK (W)	OK
Hamlin Valley	OK	OK	OK	OK	OK (W)	S	S, H	H
Ibapah	OK	OK	OK	OK	OK	OK	OK	OK
Panguitch	OK	OK	OK	OK (W)	OK (W)	S, H	OK (W)	OK (W)
Parker	OK	OK	OK	S	S	H	OK	OK
Rich	OK	OK	OK	OK	OK	OK	OK	OK
Sheeprocks	H	OK	OK	OK	OK	OK	OK	OK
Strawberry	OK	OK (W)	OK (W)	OK (W)	OK (W)	OK (W)	OK (W)	OK
Uintah	OK	OK (W)	OK (W)	OK (W)	OK (W)	OK (W)	OK (W)	OK

Figure 18: State of Utah Sage-grouse Management Areas relative to Federal Priority Habitat Management Areas and Federal Greater Sage-grouse Population Areas with federal trend leks and other leks.



Results: Fixed Wing Infrared Lek Search

Fixed wing infrared lek searches were conducted on the mornings of April 1, 2, 5, 6, 7, 8, 14, 15, 16, 17, 20, and 21 by Owyhee Air Research in the Southern Region. This year's survey was supported with $50,000 in funding provided by the Bureau of Land Management in addition to the ongoing $25,000 in funding provided by the Utah Division of Wildlife Resources. Lek searches covered approximately 253,000 acres made up of approximately 82,000 acres in the Panguitch SGMA, 88,000 acres in the Hamlin Valley SGMA and 83,000 acres in the Bald Hills SGMA.

One objective of the 2023 lek search effort was to determine if lek had moved to new locations on the Panguitch SGMA East Bech, Dog Valley or Skutumpah area. The lek search effort documented one previously undocumented lek with 11 males visible. The lek may be a satellite of the Dog Valley lek. Follow up in future years is necessary to confirm the lek, or determine if it was a result of altered distribution due to the high snow pack, or a new independent lek.

In addition to lek searches, additional flight time was used to count sage-grouse leks on the Parker Mountain portion of the Parker Mountain-Emery SGMA in areas that were difficult to access due above average snowpack limiting ground access. On Parker Mountain 27 Leks were counted from the air, documenting 198 greater sage-grouse, (78 male and 120 female).

This was the sixth year the UDWR has utilized aerial infrared surveys to search for greater sage-grouse. Previous searches have been successful in detecting new leks that DWR staff, university researches and previous helicopter lek searches were not able to locate. Sage-grouse populations regularly fluctuate on a 8-10 year period, and the populations have just come off record low counts. Low populations makes it unlikely that any new leks would be discovered, as sage-grouse more commonly expand into new areas when populations are high and contract to larger, well established leks when populations are low. In addition, the searches were conducted at the southern end of greater sage-grouse range in an area of low density populations. Based on previous year's aerial lek search results, we are confident in the methodology, and that lack of new lek detections reflects an absence of new leks to be found.

Figure 15: Flight path of 2023 aerial infrared fixed wing lek searches in Pine Valley within the Hamlin Valley SGMA. No new leks, or other sage-grouse were detected.

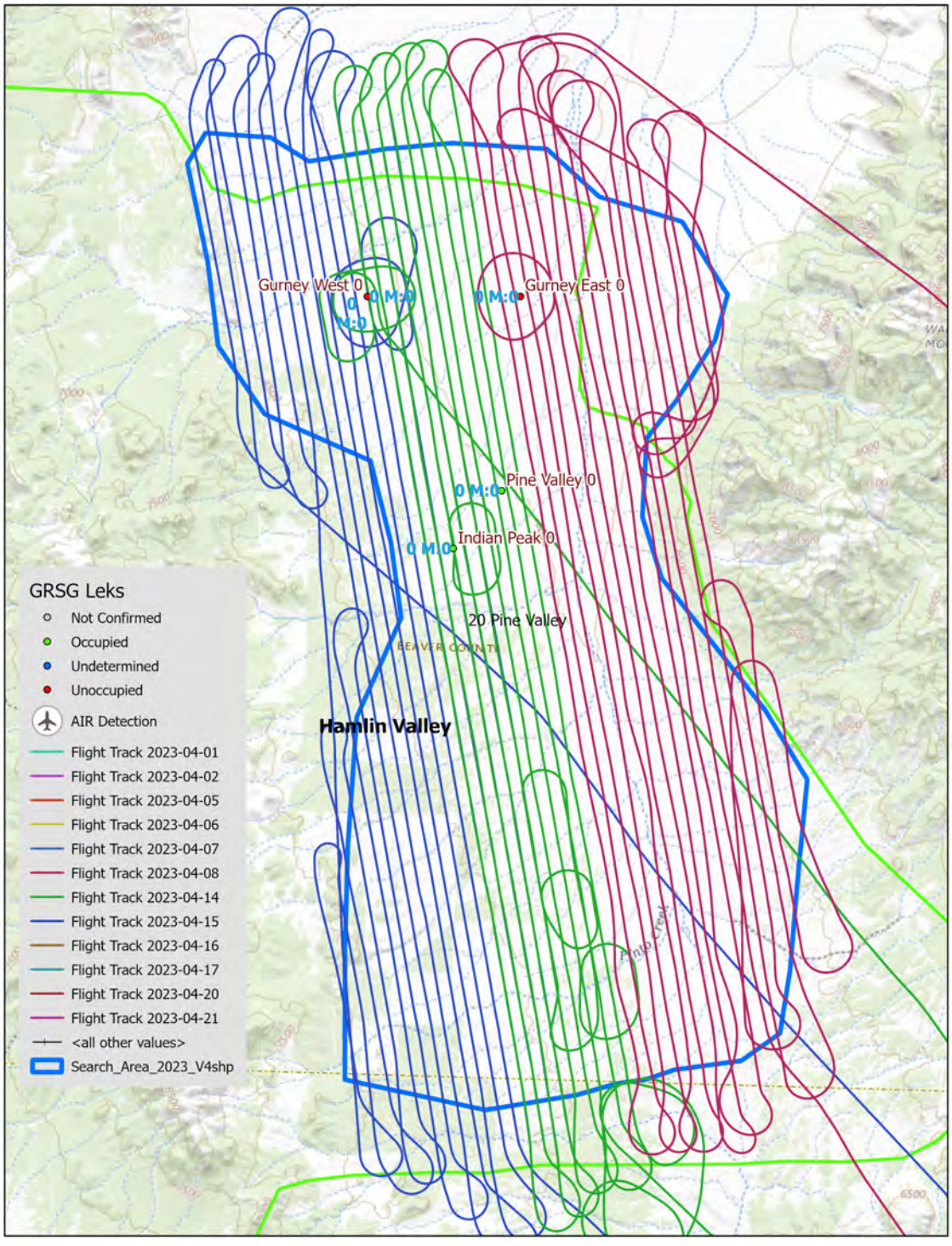


Figure 16: Flight path of 2023 aerial infrared fixed wing lek searches in the Bald Hills SGMA. No new leks were detected. Sage-grouse were observed on leks within transect areas. Additional counts were conducted on leks independent of transects to supplement ground counts due to limited assess.

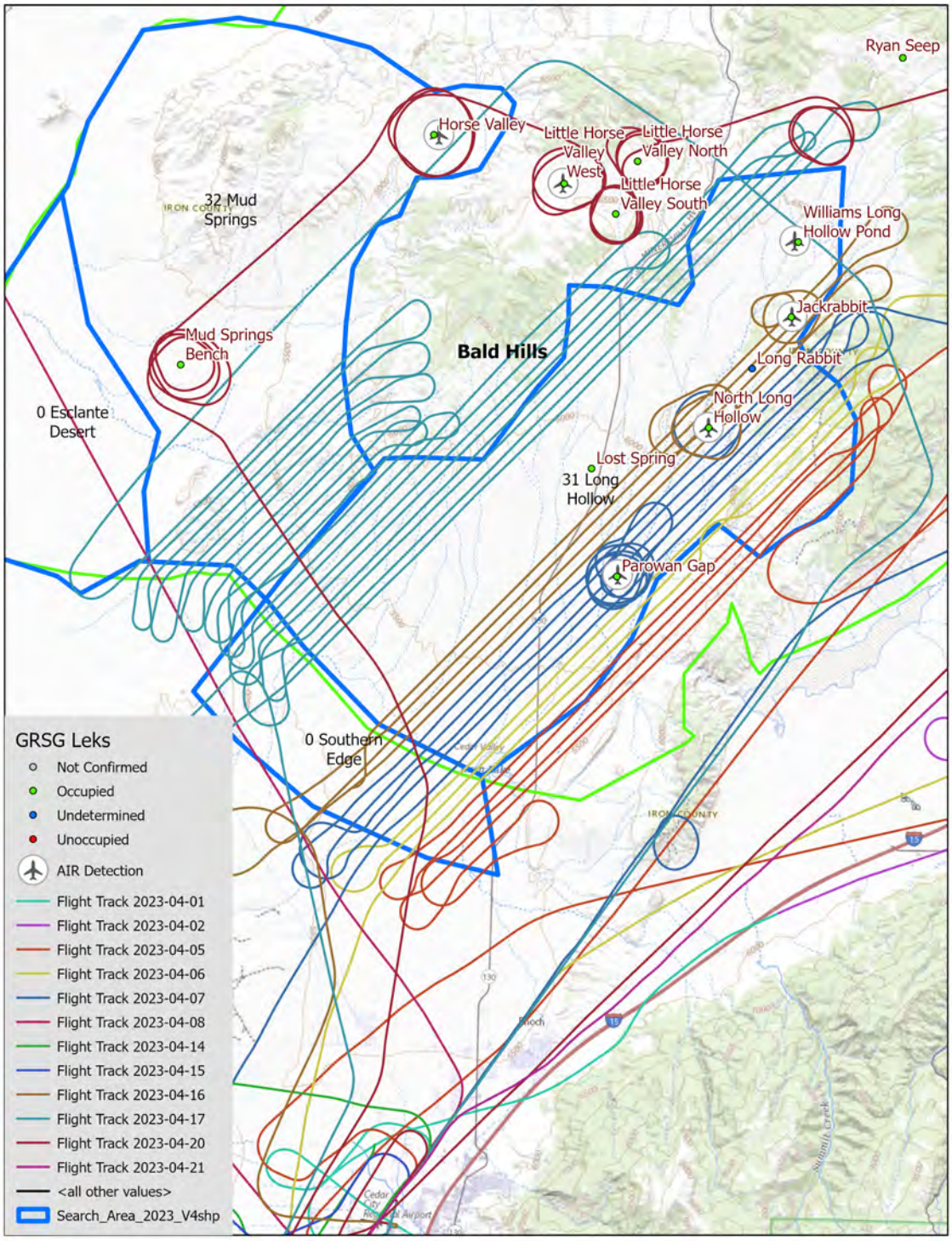


Figure 17: Flight path of 2023 aerial infrared fixed wing lek searches in the Panguitch SGMA Coyote Bench, Dog Valley and East Bench areas. One new lek was detected (Dog Valley Satellite). Additional counts were conducted on leks independent of transects to supplement ground counts due to limited assess.

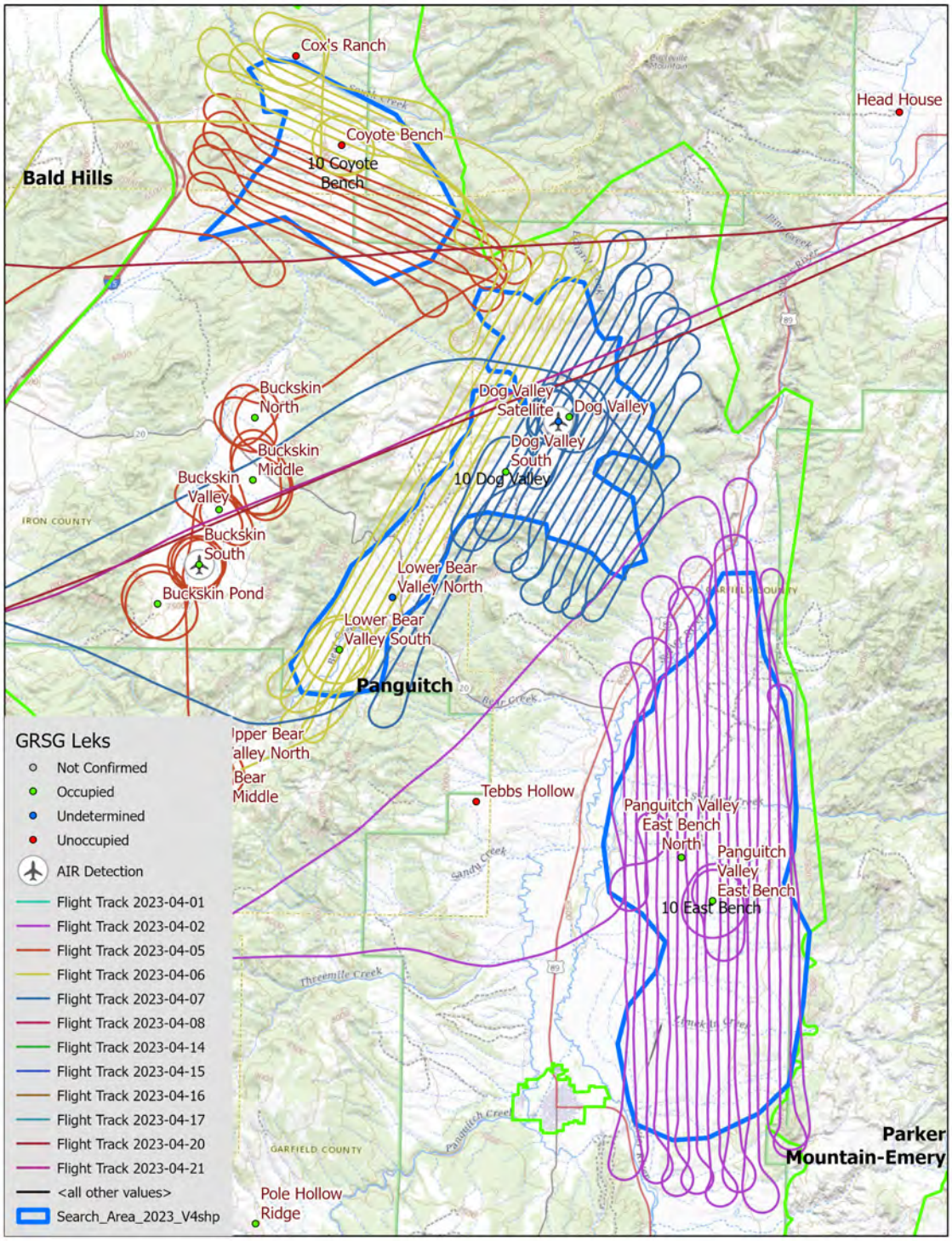


Figure 18: Flight path of 2023 aerial infrared fixed wing lek searches in the Panguitch SGMA Skutumpah area. No new leks, or other sage-grouse were detected.

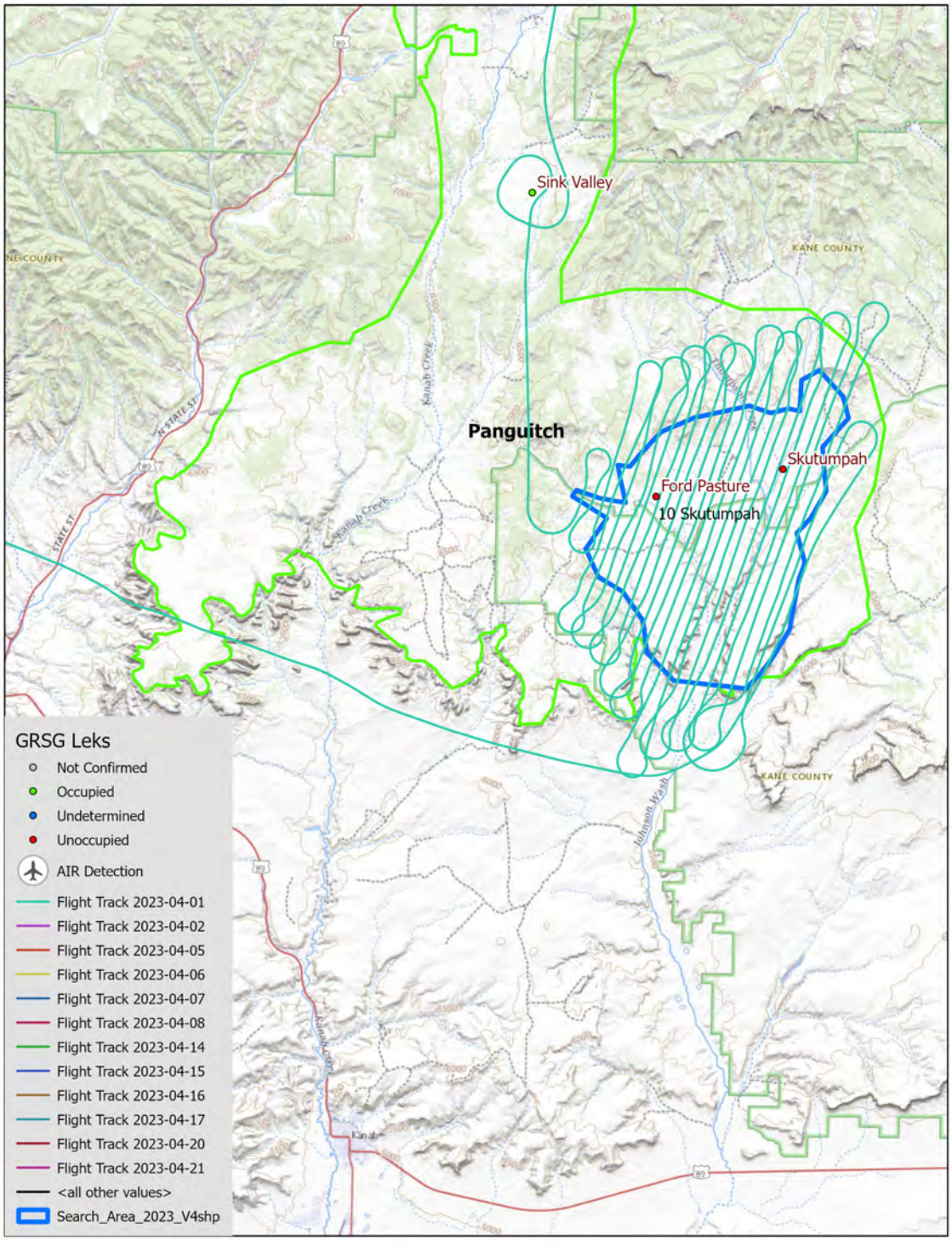


Figure 19: Flight path of 2023 aerial infrared fixed wing lek counts in the Parker Mountain-Emery SGMA Parker Mountain area. Counts were conducted to supplement ground counts in areas that were inaccessible to ground counts due to above average snow pack.

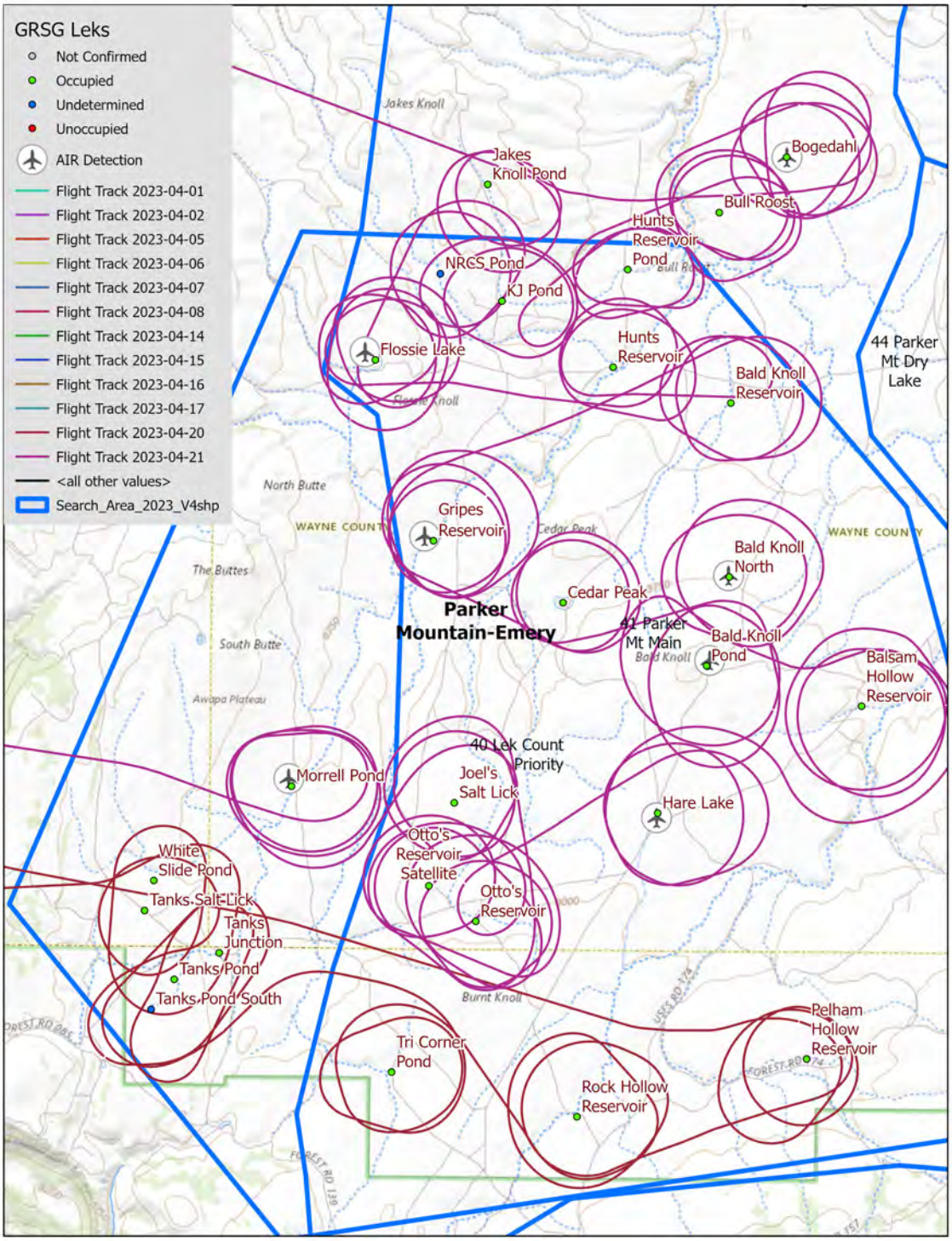


Table 4: Estimated area searched within each SGMA

SGMA	Area	Estimated Area Searched (Acres)
Panguitch	Dog Valley	20500
Panguitch	Coyote Bench	11400
Panguitch	East Bench	30900
Panguitch	Skutumpah	19100
Panguitch	SGMA Total	**81900**
Hamlin Valley	Pine Valley	88000
Hamlin Valley	SGMA Total	88000
Bald Hills	Long Hollow	65000
Bald Hills	Southern Edge	8000
Bald Hills	Mud Springs	10000
Bald Hills	SGMA Total	**83000**
Parker Mountain-Emery	Parker Mountain	NA – Counts Only
Total Area Searched		**252900**

Table 5: 2023 aerial detections of greater sage-grouse. Count totals are redacted and replaced with yes/no due to data protection policies.

Date	Lek Name	Time	Males	Females	Latitude	Longitude
4/5/2023	Buckskin South	7:55	Y	Y	38.01435	-112.60074
4/7/2023	Parowan Gap	6:38	Y	Y	37.93493	-112.99671
4/7/2023	New Satellite Lek - Dog Valley Satellite	7:18	Y	N	38.06755	-112.43960
4/16/2023	North Long Hollow	6:13	Y	Y	37.98816	-112.95718
4/16/2023	Jackrabbit	6:38	Y	N	38.02837	-112.92053
4/16/2023	Williams long hollow pond	7:27	Y	Y	38.05539	-112.92002
4/20/2023	Horse Valley	6:07	Y	N	38.09065	-113.08179
4/20/2023	Little Horse Valley West	6:17	Y	N	38.07432	-113.02526
4/20/2023	Horseshoe pond	6:46	Y	Y	38.12290	-112.83191
4/20/2023	Poorman Ridge	6:59	Y	N	38.11740	-112.76696
4/21/2023	Morrell Pond	5:57	Y	N	38.17595	-111.82864
4/21/2023	Hare Lake	6:20	Y	Y	38.17066	-111.76041
4/21/2023	Bald Knoll North	6:32	Y	Y	38.20616	-111.74746
4/21/2023	Bald Knoll Pond	6:37	Y	Y	38.19374	-111.75080
4/21/2023	Gripes Reservoir	6:47	Y	Y	38.21156	-111.80384
4/21/2023	Flossie Lake	7:06	Y	Y	38.23840	-111.81516
4/21/2023	Bogedahl	7:32	Y	Y	38.26740	-111.73726