

Agency Response to University of Wyoming Cooperative Fish and Wildlife Research Unit coordinated third party review of monitoring protocol for sage grouse populations in the Pinedale Anticline Project Area (PAPA)

**I. Lek Surveys**

Reviewer Assessment:

a.) Apply occupancy estimation methods (for surveys) which make it possible to estimate a true proportion of leks occupied from single surveys by correcting for probability of detecting activity from a single visit.

b.) The change requiring mitigation does not have a temporal component. Is the 30% decline calculated on per year basis or cumulative over several years?

Reviewer Recommendations:

1.) Define temporal component for mitigation if number of active leks fall below 30%.

2.) Routinely monitor all suitable habitats for leks using “occupancy estimation framework.” Accomplish via stratified sampling scheme with sample sizes to achieve 90% probability of detecting 30% decline with an alpha of +/- 10%.

Bureau of Land Management (BLM) and Wyoming Game and Fish Department (WGFD)

Biologist Response to Recommendation. #1:

Based on the verbiage in the 2008 Record of Decision (ROD), there was no mention of evaluating a cumulative change over several years. For sage grouse monitoring in the PAPO, lek occupancy is determined by conducting counts of all documented leks. Sampling is not part of the monitoring protocol.

To clarify the question raised by the reviewers of a temporal component when active leks fall below 30%, agency biologists recommend that the Matrix Criteria be modified to compare the number of active leks within the treatment area complexes to the average number of active leks for a series of 5 years. The Reviewers characterized the 30% threshold in terms of a decline from “*predevelopment number of active leks*”. Natural gas development on the PAPA began around 2000. The first year of significant lek count coverage by agency biologists occurred in 2003 and has continued through 2010. The average number of active leks from 2003 to 2007 is recommended as the baseline for comparison in the treatment area. Although this period is not predevelopment it is prior to full field development. Data collection was consistent and thorough and it avoids using counts that occurred during the historic low population levels from 1996 to 2000.

This annual comparison to the 2003 to 2007 5-year average would be conducted instead of comparing active lek status to a single baseline year of 2007 as described in the Mitigation Matrix. By incorporating a 5 year period as the baseline, a better representation of natural fluctuations in sage grouse numbers throughout the treatment area complexes would be used.

BLM and WGFD Biologist to Recommendation #2: It is agreed that routine monitoring of all suitable habitat for sage grouse leks should be incorporated into the ongoing monitoring protocol to ensure detection of any new leks that may show up each year. For clarification, we refer to those activities as Lek Searches not Lek Surveys.

Agency Biologists from WGFD and BLM recommend rather than implementing an occupancy estimation framework for lek surveys (see comments below in Item II. Lek Counts regarding lek counts vs. lek surveys) a more appropriate monitoring framework would entail systematic aerial and ground searches. Aerial searches covering all 6 lek complexes over a 3 year period (2 complexes/year) would be conducted over a 4-5 day period from April 1 to May 15. Flights would initiate at daylight and terminate after 2 hours. Systematic transects would be surveyed in each complex at 1 mile intervals. For years when complexes are not searched aerially, ground searches will be conducted. A minimum of 3 days per complex will be scheduled annually by Agency Biologists to search for potential new lek sites.

Budget: \$30,000 additional cost to current budget

## II. **Lek Counts**

### Reviewer Assessment:

- a.) Lek count protocol is a reasonably standard approach used by most state agencies.
- b.) Major drawback is this technique is not very sensitive to detecting population changes unless sample of leks is very large or a very high proportion of existing leks are counted.

### Reviewer Recommendations:

- 1.) Ensure lek surveys and counts are conducted in a standard manner by experienced personnel.
- 2.) Any leks not "counted" (in treatment or reference areas) should be treated as containing no (n=0) breeding males for analysis purposes.
- 3.) Sample sizes for lek counts per area (treatment vs. reference area) must meet 90% probability of detecting 30% decline with alpha of +/- 10%.

BLM and WGFD Biologist Response to Recommendation #1: This is already in place. There are a total of 49 occupied leks monitored in the treatment and reference areas combined. All 49 leks in both areas (treatment and reference areas) are presently monitored by agency personnel.

Budget: No changes from current budget

BLM and WGFD Biologist Response to Recommendation #2: Agency biologists agree with the Reviewers and for analysis purposes, any lek not meeting the "count" criteria (3

visits/lek; 7 days or more between visits from April 1 to May 15) will not be used in the data set for that year's analysis. Data will not be recorded as "zero" (unless no birds were actually observed) as recommended by the Reviewers.

Budget: No changes from current budget

BLM and WGFD Biologist Response to Recommendation #3: The goal for lek monitoring in the PAPA and entire Upper Green River Basin (UGRB) is to achieve "lek counts" (3 visits/lek; 7 days or more between visits from April 1 to May 15) for all occupied leks. In the entire UGRB from 2003 to 2008, the percent of "counts" recorded for all known leks averaged 78% ranging from 74% to 81%. In 2010, 98% of the PAPA treatment and reference area leks achieved "count" status. Leks classified as "surveys" are still visited a minimum of 2 times per season. The only reason a lek is counted less than three times and classified as a survey in a given year is due to weather conditions (mud/snow) that preclude human access to complete 3 site visits between April 1 and May 15.

To clarify how the "lek count" data would be analyzed, Agency Biologists recommend that the comparison between treatment and reference areas should use a running average of the most recent 2 years of data. This comparison would average peak numbers of males by lek within each respective area (treatment compared to reference complexes), compare that running 2 year average to the baseline average (years 2003-2007) and assess if a 30% change has occurred during the most recent 2 year period.

Budget: No changes from current budget

### **III. Nest Success**

#### Reviewer Assessment:

- a.) Many leks associated with treatment and references are relatively close in proximity and may confound data interpretation. Hens from one area may nest in other area (i.e. re-nest example).
- b.) 7 day post evaluation to detect re-nesting for predated nests is inadequate. Also, no mention of nest abandonment due to observer disturbance and how to handle occurrences.
- c.) Unclear if the 0.5 km movement threshold is measured from previous nest, leks, mapped nesting habitat, and/or sources of disturbance.

#### Reviewer Recommendations:

- 1.) Only capture/collar hens from treatment and reference areas that are spatially separated by at least twice the average distance of lek to nest movements – usually 5-6 km. Also, leg band all captured birds.
- 2.) Quantify effects of temporal (seasonal) and persistent (>2 or more seasons) disturbance on nest site selection using Thiessen polygon analysis.
- 3.) Nesting success should be modeled (logistic regression or Cox's proportional hazards).

BLM and WGF D Biologist Response to Recommendation #1-3: Agency Biologists recommend that this monitoring component be dropped from the Wildlife Monitoring and Mitigation Matrix. A total of 3 graduate level research projects (Lyon 2000, Holloran 2005, and Kaiser 2006) have been completed in the PAPA over the past 12 years. Results from these research projects indicate adult female sage grouse nest in previously selected sites regardless of changes in gas development activities at those sites. In addition, the research indicated nesting success did not differ significantly between disturbed and undisturbed nest sites. There are a variety of factors influencing nest success (weather, shrub cover, herbaceous plant cover, and predation). Continuing to document nest success cannot be justified based on the body of research recently completed.

Budget: \$120,000 for monitoring nests +/- \$50,000 annually for capture and collaring (to maintain n=100) cost reduction to current budget

Lyon, Alison G. May 2000. The potential effects of natural gas development on sage grouse (*Centrocercus urophasianus*) near Pinedale, Wyoming. Thesis. University of Wyoming, Laramie, USA.

Holloran, M. J. 2005. Greater sage-grouse (*Centrocercus urophasianus*) population response to natural gas field development in western Wyoming. Dissertation. University of Wyoming, Laramie, USA.

Kaiser, R. C. 2006. Recruitment by greater sage-grouse in association with natural gas development in western Wyoming. Thesis. University of Wyoming. Laramie, USA.

#### **IV. Brood Habitat Use**

##### Reviewer Assessment:

a.) Sampling once per month is not adequate to assess habitat use and may result in lost birds and unknown mortalities.

##### Reviewer Recommendations:

- 1.) Evaluate early brood and late brood habitat separately.
- 2.) Occasionally flush collared hens to assess if hatched nests are actually brooding.
- 3.) Separate brood rearing habitat from summer/fall habitat and increase sampling effort to 4 times / month.

BLM and WGF D Biologist Response to Recommendation #1-3: The assessment and recommendations provided by the Reviewers are appropriate. However, brood habitat selection is not a Matrix component and this monitoring activity should be deleted from any future Request for Proposals (RFPs). The mention of habitat selection in the Matrix should have referenced only the habitat selection at actual nest sites as part of the nest success monitoring. The brood habitat use component was included in the RFP only to take

advantage of an additional data collection opportunity (provide some idea of brood habitat use) while the contractor was tracking monthly sage-grouse hen distribution and monitoring mortalities.

Budget Change: \$30,000 to \$50,000 cost savings to current budget

**V. Winter Distribution**

Reviewer Assessment:

- a.) Winter distribution changes depending on winter conditions and need 3-5 years to define “normal” winter movements.
- b.) Need to mark both males and females from both treatment and reference areas with large enough sample size to assess occupancy.

Reviewer Recommendations:

- 1.) Need collared birds to improve precision of winter use estimates and apply weighted use area estimates analogous to weighted home range estimates.
- 2.) Use standard distance estimation approaches or mark-resight methods in order to detect 30% decline in winter use.

BLM and WGFD Biologist Response to Recommendation #1-2: Agency Biologists propose to conduct systematic aerial surveys for the next 4 to 5 years to assess winter sage grouse use in both the treatment and reference areas instead of radio-collaring additional birds and modeling winter habitat use as recommended by the Reviewers. It is acknowledged that there is a need for additional winter sage grouse data and that this data will help managers understand seasonal impacts of energy development on sage- grouse in the UGRB. Agency Biologists propose conducting one mid-winter (January) flight over a 5 to 7 day period to systematically survey both treatment and reference areas at ½ mile intervals.

Overtime (next 4-5 years), this data will provide the basis for refining existing sage grouse winter concentration areas and winter use maps. Once a more complete understanding of winter sage grouse distribution is achieved, a more rigorous monitoring protocol could be established to determine how sage grouse use their winter range throughout the season and to assess if a 30% decline in winter habitat use occurs (i.e. collar large sample of birds and apply distance estimation method as recommended by Reviewers) as a result of ongoing energy development. In the interim, Agency Biologists propose suspending the 30% criteria in favor of presence/absence monitoring while additional winter use data is collected for the next 4-5 years to document sage grouse use of winter concentration sites.

Budget: annual cost \$50,000 to \$70,000 (\$30,000 was included in current budget)

**VI. Noise Level Monitoring**

Reviewer Assessment:

a.) Lek edges can change between years, need standard placement of noise monitors.

Reviewer Recommendations:

1. Measuring noise impacts needs more thought.
2. Methods should be standardized to allow for repeat measurements.

BLM and WGF D Biologist Response to Recommendation #1-2: Agency Biologists agree with the Reviewers recommendations regarding noise monitoring. It is recommended that experts in noise monitoring in sage grouse habitat be consulted before continuing with additional monitoring efforts.

Budget Impact: TBD