Noise Measurement for Sage-grouse
V 1.0

Overview

As a general guide in sage-grouse habitat management areas, collaborate with state wildlife agencies to incorporate noise measurements at lek perimeters when field crews perform yearly lek counts. Noise information should then be provided to state-based interagency Adaptive Management teams and working groups for assessment.

Specific to new land-use authorizations, some standards restrict permitting of new activities in sage-grouse habitat management areas that will increase noise 10dB above ambient during lekking. The protocol below should be used to assess potential noise levels before activities are permitted, permitted with restrictions, or denied.

Protocol

Two Estimates of Noise Level are Required:
1) Noise Level for a Proposed Activity and 2) Ambient Noise Level at Lek Site

Elements Specific to Measuring Noise Level for Proposed Activity

- Identify an equivalent activity in habitat similar to the proposed activity, or use citations or previous data to estimate noise production at the same distance from the lek site as the proposed activity

Specific to Measuring Ambient Noise Level at the Lek Site

- Measurements should be made at multiple (3-4) locations at the edge of the lek site. Measurements made within a lek should be avoided, especially when birds are lekking.
- For human activities that have been initiated within 10 years before the measurement, sample only when those anthropogenic sources are not producing noise, or measure at another similar location where the noise source is not detectable above ambient sound

Common Elements to Measuring Noise Level for Proposed Activity and Ambient Level at Lek

- Due to the difficulty of measuring ambient noise levels in quiet conditions, both empirical sampling and ambient noise modeling, or equivalent, proxy sites and times may be used if justifiable.
- Measurements should be made by qualified personnel experienced in acoustical monitoring.
- Measurements should be made with a high quality, calibrated Type I (noise floor < 25 dB) sound level meter (SLM) with a microphone windscreen and (where applicable) environmental housing.
- At a minimum, the L90 (level at which measured noise is lower 90% of the time) should be collected. Other critical metrics may be collected for consideration if desired: L50, L90, L10, Leq, and Lmax. All measurements should be collected in A-weighted decibels (dBA).
- Measurements should be collected during times when noise exposure is most likely to affect greater sage-grouse— nights and mornings (i.e. 6 pm – 9 am) and should be taken at a minimum

of greater than 1 hour of suitable climatic conditions (e.g. not during a thunderstorm or noisy natural event). Preferred data collection period is 3-10 days for 3-15 hours each day.

- Environmental conditions should be measured throughout noise measurement periods so that measurements made during unsuitable conditions (e.g. loud weather events) can be excluded.
- Accurate location data should be collected for each measurement location. Surveyors also should catalog the type and location of all nearby sources of anthropogenic noise.

Evaluating Proposed Activity

A. If the estimated noise level (L90) of the proposed activity is below the average ambient noise level (given the considerations above), no sound restrictions on the permit are necessary

B. If the estimated noise level (L90) for the proxy measurement is >10dB above the ambient at the potentially impacted lek, do not authorize the activity, require noise abatement mitigations (e.g. mufflers, insulation), or restrict operations during lekking dates designated in the Plan Amendment so that excessive noise is not produced from 6 p.m. to 9 a.m.

References:

- Patricelli, G. L., Blickley, J. L., and S. L. Hooper. 2013. Recommended management strategies to limit anthropogenic noise impacts ongreater sage-grouse in Wyoming. Human–Wildlife Interactions 7:230–249.
- *Ambrose, S., and C. Florian. 2013. Sound Levels of Gas Field Activities at Greater Sage-Grouse Leks, Pinedale Anticline Project Area, Wyoming. Prepared for Wyoming Game and Fish Department Cheyenne, WY*