SAGE-GROUSE PROJECTS IN THE PATRICELLI LAB

What our lab does. Our research focuses on a wide variety of aspects of *animal communication* and how it relates to the behavior, ecology, evolution, and conservation of animals. We are interested in why animals use the signals that they do, how the environment shapes these signals, and how things that we as humans do affect the way animals communicate.

Why we study sage-grouse. Sage-grouse are a large chicken-like bird native to dry areas of the interior West. They are excellent subjects for communication studies for many reasons. For example:

1. Sage-grouse are declining throughout much of their range; in part related to natural gas and coal-bed methane development. Previous research suggests that noise from this development may be an important factor in these declines, noise that may be interfering with the grouses' ability to communicate.
2. Sage-grouse form *leks*, where females are free to compare and choose their mates from among many males that are clustered on small territories. Only a small fraction of the males will get to mate. Females base their choice largely on the courtship display of the males, meaning their courtship signals are the key to understanding why a few lucky males are chosen and the rest are not.

The 'Noise' Project. To study the effects of noise from energy development on the grouse, we first recorded sounds from a variety of potential noise sources to see how loud the energy development actually is. Additionally, we are now in the second year of an experimental study to use outdoor speakers to broadcast some of these sounds at leks that are currently not impacted. We will compare the numbers of birds as well as the behaviors of birds at these leks and at control leks that are equivalent except for the experimental noise.

The 'Monument Lek' Project. Here we are interested in determining what separates the 'good' males from the rest to study how sexual selection is shaping courtship in this species. We use an array of many microphones to record the males' displays and to pinpoint where they are on the lek. We also use a robotic female grouse as a stimulus to record males from the perspective of a female and to examine trade-offs in how males display. We relate these variables to mating success that we measure from videos of courtship behavior.

Opportunities in the Patricelli lab. We are eager to have students working with us on both projects. Assistants will begin by helping us analyze videotapes of grouse leks. We ask for a minimum commitment of 5-6 hours per week, in blocks of 2-3 hours at a time. Course credit is available. We also invite assistants to attend our weekly lab meetings in which we informally discuss current topics in behavioral and evolutionary ecology (among other things). Finally, we encourage students who have been with us for a time to talk to us about developing more independent projects related to the sage-grouse or other projects of interest.