

AOS/ SCO 2017 American Ornithology Conference
Symposia Proposal

1. Type of Event: Symposium

2. Title of Event: Mechanisms Underlying Avian Response to Energy Development

3. Organizers: Lindsey Sanders, Wyoming Cooperative Research Unit, University of Wyoming, sanders.lindsey@gmail.com

4. Invited Speakers:

1. Anna Chalfoun, University of Wyoming. Natural gas fields as ecological traps for nesting sagebrush songbirds.
2. Lindsey Sanders, University of Wyoming. Are food subsidies from reclaimed areas sustaining nest-predator populations on natural gas fields?
3. Julia Shonfield, University of Alberta. Impacts of energy development and disturbance on owls in the boreal forest at multiple scales.
4. Nicola Koper, University of Manitoba. Understanding why energy development affects birds: effects of perch sites, infrastructure, traffic and noise
5. Patricia Rosa, University of Manitoba. Effects of petroleum infrastructure on abundance and productivity of grassland birds: role of anthropogenic noise
6. Paulson Des Brisay, University of Manitoba. The role of stress in mediating effects of petroleum infrastructure on fitness
7. Alexandra Heathcote, University of Manitoba. Effects of petroleum infrastructure and its noise on stress in songbird nestlings.
8. Laura Farwell, West Virginia University. Avian community response to forest fragmentation across the Marcellus region
9. Petra Wood, West Virginia University. Response of Louisiana waterthrush and their benthic prey to shale gas development.

5. Preferred Duration: We would prefer a full-day session of regular length talks, and plan to incorporate more research into renewable energies to fill the remaining talk slots (L. Sanders is currently in contact with two researchers studying biofuels who are interested in participating, and plans to contact researchers studying wind energy as well). However, if only a half-day slot is available, we would be amenable to shortening this list slightly and instead having a symposium focused around oil and gas development, rather than covering a larger breadth of energy extraction practices.

6. Description: Energy development is a rapidly expanding source of human disturbance. Global energy consumption is expected to increase by 1.5% each year until 2040 (International Energy Outlook, 2016), and with the development of unconventional extraction technologies such as shale gas and hydraulic fracturing, production is projected to continue increasing to meet these demands. The negative effects of energy development on avian communities are

many, and are manifested via behavioral avoidance of development sites, decreased habitat quality, decreased reproductive success and increased predation risk, to name a few. Patterns of negative avian response to energy development have been documented around the globe across a myriad of species and habitat types. Research into the mechanisms underlying these patterns is less common, but is a crucial step towards understanding observed patterns of avian decline. Without an understanding of *why* birds respond the way they do to human disturbance, we will have no way of mitigating those effects in the future.

This symposium will showcase a number of recent studies investigating the response of avian communities to energy development, and the mechanisms underlying those responses. Talks will cover an array of energy extraction practices, from wind energy to biomass fuels, but with emphasis placed on avian response to oil and gas extraction activities, as these practices combined account for over 50% of global energy consumption (International Energy Outlook, 2016). Within each of these disturbance types, we will explore a variety of means by which human activities associated with energy extraction may be altering avian communities. For example: At what scale does disturbance from energy development most affect avian populations? Are birds behaviorally avoiding nesting near specific infrastructure on gas fields? How are communities of nest predators or food resources altered by this disturbance? Is stress from nesting near energy infrastructure lowering avian fitness? Our goal is to highlight a variety of potential mechanisms of avian decline associated with a variety of energy extraction practices, and bring researchers together to discuss the breadth of this problem.

The current speakers in this symposium are predominantly women. Although both men and women were invited to speak in this symposium, we are pleased to have such a large number of women participating, as it highlights the important research women are doing at the forefront of this field.

7. Rationale: Energy extraction poses a threat to avian communities inhabiting a variety of habitat types with different life history strategies around the globe. With the projected expansion of energy infrastructure in the coming years, even populations that are currently unthreatened by development may one day soon experience its effects. The practical applications of research into mechanisms of avian response to energy development are manifold, as this information is necessary for developing effective management strategies for birds living near energy extraction and can help to inform management of birds living near a wide variety of other human disturbances as well. Nearly every avian population worldwide is currently experiencing some form of human disturbance, making this symposium relevant to a large number of researchers planning to attend this conference. The theme for this year's conference is 'Birds in the Anthropocene,' making this topic especially timely, as it explores how human activities are changing the context in which many avian communities evolved.