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The Joys of Winter Birding

News for Members



**The**  
**SONG SPARROW**

by Zofia Laubitz and Sarah Marshall

## How Do Wind Turbines and Oil and Gas Infrastructure Affect Birds? Empirical Evidence Based on Citizen-Science Data

Presented by Erik Katovich - October 7, 2024

by Zofia Laubitz

The subject our October speaker, Erik Katovich, presented could hardly have been more topical: how energy infrastructures affect birds. We've all heard stories of ducks floundering in oil sands tailing ponds, dead birds, bats and even insects littering the ground below wind turbines, and similar disasters. Erik is an assistant professor in Environmental and Natural Resource Economics at the University of Connecticut, whose research focuses on understanding how we can best govern natural resources and extractive industries to achieve sustainability. He's also a lifelong birder who has capitalized on data from citizen science – specifically, the Christmas Bird Count (CBC) – to investigate bird population trends in the vicinity of wind turbines and hydraulic fracturing (“fracking”) for shale gas in the United States. Note that word “population”: it’s an important one!



**CBCs have been carried out for a century and a quarter** and cover the continent. Erik realized that these counts, carried out in the same locations year after year, would provide an outstanding dataset on changes in bird populations over time. He chose to study the effects of wind power and shale gas fracking because both technologies have expanded rapidly, as the USA shifts away from coal and toward natural gas and renewable energies. Specifically, Erik measured the effects of wind turbines and fracking installations on bird populations in the lower 48 states from 2000 to 2020, using advanced statistical methods and CBC data.

There has been much media coverage of how wind turbines kill birds; interestingly, there has been far less discussion of the effects of oil and gas exploration, including fracking. Wind turbines have been estimated to kill from 140,000 to 670,000 birds each year in the USA; these numbers are based on the collection of bodies under turbines, which are then extrapolated to the whole country. For purposes of comparison, building strikes kill some 600 million birds per year, while cats kill 1 billion or more.

**The effects of fracking** include air, water, noise and light pollution; road traffic and dust; diversity declines and avoidance behaviors; and landscape fragmentation. Flares from big fracking sites are extraordinarily bright. Erik showed us a satellite photograph of the USA at night, which revealed that some sites emit more light – way more light – than large cities like New York and Los Angeles!

Erik used the difference-in-differences statistical method to compare treated CBC count circles (those that contain fracking wells or wind turbines) with control circles (those that contain no wells or turbines). The number of count circles affected by energy infrastructures has grown since 2000. He controlled for other factors that might influence count results, such as weather and number of counters in a circle. Because he was using data from counts that take place in December, the impacts he found affect birds that are present at that time of year – not the peak period for bird numbers!

**Erik's results** were illustrated with some of the most eloquent, easily interpretable graphs it has been my pleasure to behold. And the results were equally clear. For fracking, there was a mean overall 15% decline in bird populations following construction of a shale gas well in or near a count circle. The impact was greatest on grassland, non-urban and long-distance migratory birds, as well as raptors. For wind turbines, on the other hand, there were NO significant effects on subsequent CBC results in nearby circles! As Erik emphasized, this does not mean that wind turbines don't kill birds –



they do. But the effects aren't significant at the population level. Moreover, as the number of fracking wells in an area increases, the decline in bird populations becomes even greater. This is not true of turbines; larger wind farms don't have larger impacts. As for changes over time, effects at shale gas sites appear immediately during construction and continue for years thereafter. But wind turbines have no significant impact even during construction, when activity at the site is greatest.

Erik focused more closely on sensitive bird habitats such as migratory stopovers, breeding grounds, biodiversity hot spots – in other words, Important Bird Areas (IBAs). When shale gas wells are drilled inside IBAs, the negative effects are even greater than they are elsewhere: bird populations and diversity are significantly reduced. On the other hand, even when wind turbines are planted right inside an IBA, there are no significant negative impacts on bird populations. As Erik stressed, we should strive to minimize the effects of all energy infrastructures on wildlife. In particular, we should avoid drilling shale gas wells in IBAs. And even though wind turbines are demonstrably less harmful, we should seek out ways to make them less dangerous to wildlife; various methods are being tested, such as painting the blades different colours.

This fascinating talk dispelled some widespread myths about an important renewable energy source. Not only that but it relied on a citizen science initiative that many of us have participated in – the Christmas Bird Count – reminding us that our volunteer efforts each year can contribute to important scientific findings and, hopefully, to greener technologies.

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## Sandhill Cranes on the Rise in Quebec

### Presented by Christine Lepage - November 4, 2024

by Sarah Marshall

Our November speaker, Christine Lepage, has been a waterfowl biologist with the Canadian Wildlife Service since 1994. Her work mainly focuses on the conservation of sea duck populations in Quebec, through aerial surveys, banding and telemetry monitoring. More recently, however, the situation of Sandhill Cranes (SACR) in the province has piqued her curiosity. About 20 years ago, Christine was in a helicopter doing an aerial survey of waterfowl, and saw her first SACR! That was very special, and since then the Sandhill Crane has become one of her favourite species. Christine has published over 42 peer-reviewed publications and is the co-author of many others. You can read more about the SACR and Christine's work in the Fall 2024 issue of Quebec Oiseaux.



**The numbers of breeding SACR** has increased significantly over the past 30 years in Quebec and the presentation provided an overview of the population trend and described the field work that surrounded a telemetry study of SACR, carried out between 2019 and 2022, by the CWS.

**An introduction to SACR:** They live a long time, for a bird. It is not unusual to find birds that are more than 20 years old. In one case, one was caught and had been banded 40 years prior! The pair stays together for life, and they return to the same nest year after year. They usually lay two eggs, on an open scrape-like nest in peatland and boggy areas. Since the 1990s, each month of May, the CWS has been conducting aerial waterfowl (American Black Duck, Ring-necked Duck, Common Merganser, Common Goldeneye, Canada Goose and Green-winged Teal) surveys by helicopter in Ontario, Quebec and the Atlantic provinces. Helicopter surveys involve hovering over habitats, manually counting species. Since SACR live in the same habitats as the waterfowl intended for survey, they also have been spotted. The number of breeding pairs has been noted since the 1990s, so trends and the progression of occupancy of the SACR in the province can be evaluated over time. The occupancy within the territory is plotted on a map in a grid with each dot representing a set 10 x 10 metre area. In the past 30 years, there has been an increase of breeding numbers, density and territory of SACR in Quebec. For example, in 2002 there were only five 'dots' occupied; in 2010 there were 21 'dots' occupied and in 2020 there were 43 'dots' occupied! Through ground observations, it is confirmed that several of the 'dots' have more than one breeding pair. Last spring, there were 7,400 breeding pairs of SACR in Quebec, which represents a 9% increase per year in the province, specifically in the western half of Quebec.