

# Norwegian Study Suggests a Way to Make Wind Farms Safer For Birds

By Eric Stavney Mukilteo, WA

## **An experiment at the Smøla Wind-Power Plant near Trondheim shows promise in reducing bird fatalities.**

Researchers at the Norwegian Institute for Nature Research have found a simple way to reduce bird fatalities at a wind turbine farm. In a study published in *Ecology and Evolution* in July 2020, Roel May, et al. set up an experiment at Smøla wind-power plant located on an island west of 70 mi (115 km) west of Trondheim.

Bird strikes are not uncommon in wind farms, and the frequency of deaths varies by the location of the farm and the kinds of birds flying through. So for the wind-power industry, which positions itself as ecologically friendly, reducing the impact on wild populations is especially important.

Previous studies of bird strikes have suggested that birds have trouble seeing the blur of whirling propellers as white-tailed eagle strikes, followed by a lesser number of willow ptarmigans and common snipes. Some of this makes sense, but some is counterintuitive.



*The survival of white-tailed eagles, Haliaeetus albicilla, was most strongly affected in the outcome of the study. Photo: Stian LysbergSolum / NTB scanpix*

The ptarmigan deaths can be explained perhaps by their limited forward vision. Ptarmigans have their eyes located more around the sides of their heads, so they have a blind spot straight ahead of them when flying. But they also don't usually fly very high or very far. Most of the dead ptarmigans at the Smøla Wind Farm were found at the base of the turbine towers, with intact

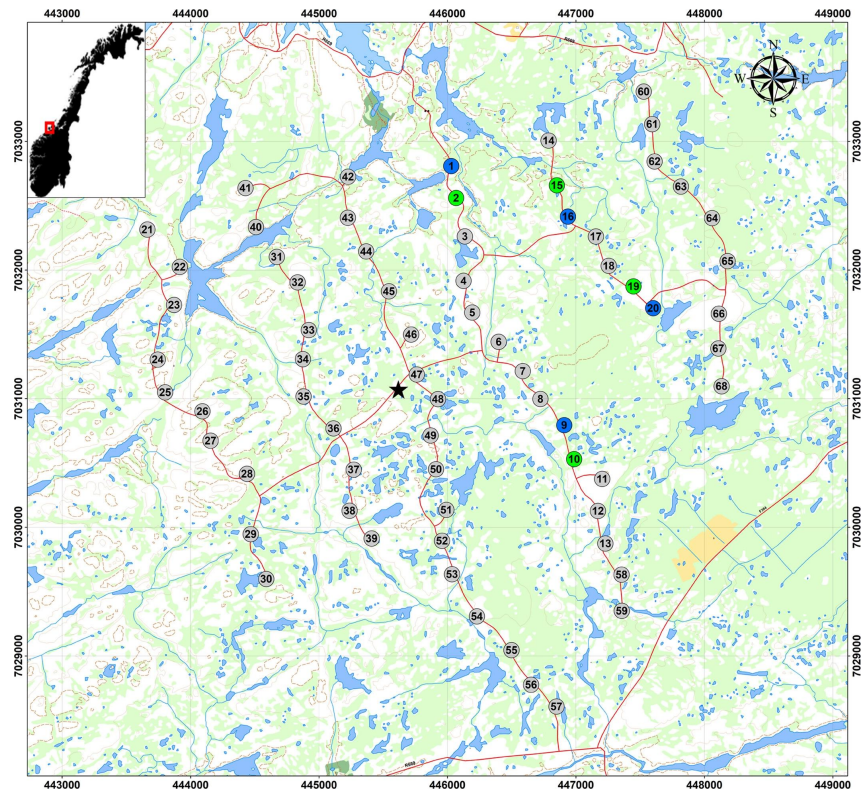
carcasses, suggesting that lacking good forward vision, they may fly straight into the turbine towers.

But the white-tailed eagles struck by the turbine blades are harder to explain. Some deaths were expected because of the large population of eagles on Smøla. Eagles, however, have excellent binocular forward vision, and theoretically should be able to see the whirling blades better than other birds. It could be that eagles may spend more time searching the ground for prey than watching where they're flying.

The experiment went like this: first, bird carcasses were collected around the 68 Smøla wind turbines, and identified by species, as part of regular maintenance activities for seven years. Then the researchers began their study by painting one of the propeller blades black on each of 4 turbines scattered through two different rows on the farm. Then scientists counted bird carcasses around those four, and four other "control" turbines, for four years.

Scientists hypothesized that the whirling white turbine blades are hard to see, but if one was black, the whole propeller would stand out better when turning. Painting one blade, rather than all blades creates a stronger difference in the whirl of blades.

The study found that white-tailed eagle fatalities dropped by over 70% around the turbines that were painted, while those around other turbines were about the same.



*The Smøla wind farm is located on Smøla Island on the west coast, near Trondheim. Four wind turbines (2, 10, 15, and 19) had one propeller painted; four others (1, 9, 16, 20) served as unmodified controls. From Ecology and Evolution journal under a Creative Commons license.*

This would seem to be a strong recommendation to the wind farm industry to paint propeller blades. But painting a blade on the wind farm required workers to use a lift to reach the blades, and only do it in calm weather. The researchers point to how much easier and cheaper it would be if one blade was painted before propellers are installed when wind farms are being built.

Painting one blade didn't seem to affect the ptarmigans much, who continued to fly into the towers. A different solution, such as alternating stripes on the towers, might work for them.

The scientists concluded that while bird fatalities were greatly reduced in this experiment, they note this study was performed only at one wind farm in Norway, and involved a relatively small number of bird species common to that area. More studies are needed to see if this may be a dependable way to reduce bird fatalities at wind farms in other areas and with other bird populations.

Jethro Gauld, a biologist from the University of East Anglia, who was not involved in this research, would like to see similar studies done in Southern Spain, where many wind farms overlap with the migratory flight paths of millions of birds.



*One of three blades was painted black on the four study experimental turbines, which was thought to help birds see the whirling blades more easily. From Ecology and Evolution journal under a Creative Commons license.*

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