



## **ADVICE FROM AN EXPERT** *by Mick Sagrillo*

### **PUTTING WIND POWER'S EFFECT ON BIRDS IN PERSPECTIVE**

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Electricity generated from renewable energy resources is an environmentally-preferred alternative to conventionally produced electricity from fossil fuel and nuclear power plants. Many people believe that wind turbines should be part of the solution to a healthier environment, not part of the problem.

Over the past fifteen years, a number of reports have appeared in the popular press about wind turbines killing birds. Some writers have gone so far as to dub wind generators "raptor-matics" and "cuisinarts of the sky". Unfortunately, some of these articles have been used as "evidence" to stop the construction of a wind generator in someone's back yard. The reports of dead birds create a dilemma. Do wind generators really kill birds? If so, how serious is the problem?

A confused public oftentimes does not know what to believe. Many people participate in the U.S.'s second largest past time, bird watching. Other's are truly concerned about the environment and what they perceive as yet another assault on our fragile ecosystem. Unwittingly, they rally behind the few ill-informed obstructionists who have realized that the perception of bird mortality due to wind turbines is a hot button issue, with the power to bring construction to a halt.

Birds live a tenuous existence. There are any number of things that can cause their individual deaths or collective demise. For example, bird collisions with objects in nature are a rather common occurrence, and young birds are quite clumsy when it comes to landing on a perch after flight. As a result, about 30% of total first-year bird deaths are attributed to natural collisions.

By far, the largest causes of mortality among birds include loss of habitat due to human infringement, environmental despoliation, and collisions with man-made objects. Since wind turbines fall into the last category, it is worthwhile to examine other human causes of avian deaths and compare these to mortality from wind turbines.

#### **Death by....**

Utility transmission and distribution lines, the backbone of our electrical power system, are responsible for 130 to 174 million bird deaths a year in the U.S.<sup>1</sup> Many of the affected birds are those with large wingspans, including raptors and waterfowl. While attempting to land on power lines and poles, birds are sometimes electrocuted when

their wings span between two hot wires. Many other birds are killed as their flight paths intersect the power lines strung between poles and towers. One report states that: "for some types of birds, power line collisions appear to be a significant source of mortality."[2](#)

Collisions with automobiles and trucks result in the deaths of between 60 and 80 million birds annually in the U.S.[3](#) As more vehicles share the roadway, and our automotive society becomes more pervasive, these numbers will only increase. Our dependence on oil has taken its toll on birds too. Even the relatively high incidence of bird kills at Altamont Pass (about 92 per year) pales in comparison to the number of birds killed from the Exxon Valdez oil spill in Alaska. In fact, according to author Paul Gipe, the Altamont Pass wind farm would have to operate for 500 to 1000 years to "achieve" the same mortality level as the Exxon Valdez event in 1989.

Tall building and residential house windows also claim their share of birds. Some of the five million tall buildings in U.S. cities have been documented as being a chronic mortality problem for migrating birds. There are more than 100 million houses in the U.S. House windows are more of a problem for birds in rural areas than in cities or towns. While there are no required ongoing studies of bird mortality due to buildings or house windows, the best estimates put the toll due collisions with these structures at between 100 million and a staggering 1 billion deaths annually.[4](#)

Lighted communication towers turn out to be one of the more serious problems for birds, especially for migratory species that fly at night. One study began its conclusion with, "It is apparent from the analysis of the data that significant numbers of birds are dying in collisions with communications towers, their guy wires, and related structures."[5](#) Another report states, "The main environmental problem we are watching out for with telecommunication towers are the deaths of birds and bats."[6](#)

This is not news, as bird collisions with lighted television and radio towers have been documented for over 50 years. Some towers are responsible for very high episodic fatalities. One television transmitter tower in Eau Claire, WI, was responsible for the deaths of over 1,000 birds on each of 24 consecutive nights. A "record 30,000 birds were estimated killed on one night" at this same tower.[7](#) In Kansas, 10,000 birds were killed in one night by a telecommunication tower.[8](#) Numerous large bird kills, while not as dramatic as the examples cited above, continue to occur across the country at telecommunication tower sites.

The number of telecommunication towers in the U.S. currently exceeds 77,000, and this number could easily double by 2010. The rush to construction is being driven mainly by our use of cell phones, and to a lesser extent by the impending switch to digital television and radio. Current mortality estimates due to telecommunication towers are 40 to 50 million birds per year.[9](#) The proliferation of these towers in the near future will only exacerbate this situation.

Agricultural pesticides are "conservatively estimated" to directly kill 67 million birds per year.[10](#) These numbers do not account for avian mortality associated with other pesticide applications, such as on golf courses. Nor do they take into consideration secondary losses due to pesticide use as these toxic chemicals travel up the food chain. This includes poisoning due to birds ingesting sprayed insects, the intended target of

the pesticides.

Cats, both feral and housecats, also take their toll on birds. A Wisconsin Department of Natural Resources (DNR) report states that, "recent research suggests that rural free-ranging domestic cats in Wisconsin may be killing between 8 and 217 million birds each year. The most reasonable estimates indicate that 39 million birds are killed in the state each year."[11](#)

There are other studies on the impacts of jet engines, smoke stacks, bridges, and any number of other human structures and activities that threaten birds on a daily basis. Together, human infrastructure and industrial activities are responsible for one to four million bird deaths per day!

### **But what about wind turbines?**

Commercial wind turbines

Since the mid-1980's, a number of research organizations, universities, and consultants have conducted studies on avian mortality due to wind turbines. In the U.S., these studies were prompted because of the relatively high number of raptors that were found dead at the Altamont Pass Wind Farms near San Francisco.

After dozens of studies spanning nearly two decades, we now know that the Altamont Pass situation is unusual in the U.S. The high raptor mortality there was the result of a convergence of factors, some of which were due to the bad siting in the local ecosystem while others were due to the wind turbine and tower technology used at the time. In fact, a very different situation exists not far away at the San Geronio Pass Wind Farms near Palm Springs. A 1986 study found that 69 million birds flew through the San Geronio Pass during the Spring and Fall migrations. During both migrating seasons, only 38 dead birds were found during that typical year, representing only 0.00006% of the migrating population.

A report recently prepared for the Bonneville Power Administration in the Northwest U.S. states that "raptor mortality has been absent to very low at all newer generation wind plants studied in the U.S. This and other information regarding wind turbine design and wind plant/wind turbine siting strongly suggests that the level of raptor mortality observed at Altamont Pass is quite unique."[12](#)

The National Wind Coordinating Committee (NWCC) completed a comparison of wind farm avian mortality with bird mortality caused by other man-made structures in the U.S.

The NWCC did not conduct its own study, but analyzed all of the research done to date on various causes of avian mortality, including commercial wind farm turbines. They report that "data collected outside California indicate an average of 1.83 avian fatalities per turbine (for all species combined), and 0.006 raptor fatalities per turbine per year. Based on current projections of 3,500 operational wind turbines in the US by the end of 2001, excluding California, the total annual mortality was estimated at approximately 6,400 bird fatalities per year for all species combined."[13](#)

This report states that its intent is to "put avian mortality associated with windpower

development into perspective with other significant sources of avian collision mortality across the United States."<sup>14</sup> The NWCC reports that: "Based on current estimates, windplant related avian collision fatalities probably represent from 0.01% to 0.02% (i.e., 1 out of every 5,000 to 10,000) of the annual avian collision fatalities in the United States."<sup>15</sup> That is, commercial wind turbines cause the direct deaths of only 0.01% to 0.02% of all of the birds killed by collisions with man-made structures and activities in the U.S.

### **Back in Wisconsin**

My home state of Wisconsin is a good example of current research. In December of 2002, the report "Effects of Wind Turbines on Birds and Bats in Northeast Wisconsin" was released. The study was completed by Robert Howe and Amy Wolf of the University of Wisconsin-Green Bay, and William Evans. Their study covered a two-year period between 1999 and 2001, in the area surrounding the 31 turbines operating in Kewaunee County by Madison Gas & Electric (MG&E) and Wisconsin Public Service (WPS) Corporation.

The report found that over the study period, 25 bird carcasses were found at the sites. The report states that "the resulting mortality rate of 1.29 birds/tower/year is close to the nationwide estimate of 2.19 birds/tower.<sup>16</sup> The report further states, "While bird collisions do occur (with commercial wind turbines) the impacts on global populations appear to be relatively minor, especially in comparison with other human-related causes of mortality such as communications towers, collisions with buildings, and vehicles collisions. This is especially true for small scale facilities like the MG&E and WPS wind farms in Kewaunee County."<sup>17</sup>

The report goes on to say, "previous studies suggest that the frequency of avian collisions with wind turbines is low, and the impact of wind power on bird populations today is negligible. Our study provides little evidence to refute this claim."<sup>18</sup>

So, while wind farms are responsible for the deaths of some birds, when put into the perspective of other causes of avian mortality, the impact is quite low. In other words, bird mortality at wind farms, compared to other human-related causes of bird mortality, is biologically and statistically insignificant. There is no evidence that birds are routinely being battered out of the air by rotating wind turbine blades as postulated by some in the popular press.

### **Home-sized wind systems**

How does all of this impact the homeowner who wishes to secure a building permit to install a wind generator and tower on his or her property? They will likely still be quizzed by zoning officials or a concerned public with little to go on but the sensational headlines in the regional press. But while the press may or may not get the facts right, peoples' concerns are real, and need to be addressed with factual information such as is presented here.

While there have been any number of studies done on bird mortality caused by commercial wind installations, none have been done on the impact of home-sized wind systems on birds. The reason? It is just not an issue, especially when "big" wind's

impact on birds is considered biologically insignificant.

When confronted with the question of why there were no studies done on home-sized wind systems and birds, a Wisconsin Department of Natural Resources person familiar with these issues responded, "it is not even on the radar screen." There has never been a report or documentation of a home-sized wind turbine killing birds in Wisconsin.

The Wisconsin Department of Natural Resources, or any other government or research organization for that matter, just does not have the financial resources to conduct a study just because a zoning official requests it, especially given the lack of evidence nationwide that any problem exists with home-sized turbines. Based on our best available information, the relatively smaller blades and short tower heights of residential wind energy systems do not present a threat to birds.

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### **Notes:**

1. National Wind Coordinating Committee Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States (NWCC), p. 10.
2. NWCC, p. 10.
3. NWCC, p. 8.
4. Tower Kill p. 2.
5. Communication Towers: A Deadly Hazard To Birds p. 19.
6. Battered By Airwaves p. 6.
7. Battered By Airwaves p. 4.
8. Communication Tower Guidelines Could Protect Migrating Birds p. 2.
9. NWCC p. 12.
10. The Environmental and Economic Costs of Pesticide Use p. 1.
11. Cats and Wildlife: A Conservation Dilemma p. 2.
12. Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting and Mortality information from Proposed and Existing Wind Developments p. 7.
13. NWCC p. 2.
14. NWCC p. 1.
15. NWCC p. 2.
16. Effects of Wind Turbines on Birds and Bats in Northeast Wisconsin p. 68.
17. Effects of Wind Turbines on Birds and Bats in Northeast Wisconsin p. 75.
18. Effects of Wind Turbines on Birds and Bats in Northeast Wisconsin p. 67.

### **References:**

Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States; National Wind Coordinating Committee; West, Inc.; August, 2001

Battered By Airwaves; Wendy K. Weisenel; Wisconsin Department of Natural Resources; October, 2002.

Cats and Wildlife: A Conservation Dilemma; John S. Coleman, Stanley A. Temple, and

Scott R. Craven; University of Wisconsin-Extension; 1997.

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Tower Kill; Joe Eaton; Earth Island Journal; Winter, 2003

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