



Mincing machines: an estimated 40,000 birds die a year in US wind turbine blades — conservationists worry that rare raptor populations are at risk.

Wind farms' deadly reputation hard to shift

What's 3% of a bird? The last seven centimetres of a swan's wingspan? The right foot of an ostrich? Or the annual death toll attributable to an average wind turbine? In the context of last week's report¹ by the US National Academy of Sciences (NAS) on the environmental impacts of wind-energy projects, it's the third definition that counts. It takes 30-odd turbines to reach a kill-rate of one bird a year.

The scientists who wrote the report naturally attached lots of caveats to this figure, which they gleaned from 14 studies they felt were of good quality. They acknowledged that rates can differ widely from site to site, and that although, as Hamlet said, there is a special providence in the fall of a sparrow, such a fall might not be quite as special, or worth avoiding, as the death of a bald eagle.

In the final analysis, though, whichever way you slice it, or them, America's birds seem to die in turbine blades at a rate no higher than 40,000 a year. Deaths due to domestic cats, on the other hand, are put at "hundreds of millions". It is possible, the panel noted, that the turbines are rather worse for bats; recent studies have turned up more of their carcasses than expected. But the numbers are still small.

The shadow of the waxwing slain

It is unlikely, though, that the study will allay the worries of bird-lovers who look on wind farms with loathing. For carbon-free power sources, wind turbines have an oddly bad reputation among conservationists: bird safety, like landscape aesthetics, is a common cause for complaint.

And the wind farms do not have a completely clean bill of health. As the NAS report pointed out, much of the data available is too narrow and site specific. "My personal opinion is that the evidence base is very poor," agrees Andrew Pullin, head of the Birmingham, UK-based Centre for Evidence-Based Conservation. The Royal Society for the Protection of Birds (RSPB), a British charity with a large membership and quite a lot of muscle, points to the fact that while its members oppose large offshore developments, evidence on British wind farms is limited to studies of small installations

onshore. It has also taken a vociferous stance against a vast 234-turbine wind farm planned for the Isle of Lewis in the Scottish Hebrides.

In Spain, the world's number three wind-power producer after the United States and Germany, published studies also suggest that the number of birds killed is low. But Spanish environmentalists feel the figures aren't telling the full story. Alvaro Camiña, an environmental consultant who monitors bird fatalities at 70 of the country's 140 wind-power farms, says that in the case of a widely accepted study published in 2004 (ref. 2), the field work was completed a decade earlier when turbines were much smaller.

Camiña, who is paid by the regional governments of Rioja, Valencia and Andalucía, recently submitted a report on his research to the Ministry of Environment in Madrid. It is due to be released soon. Of particular importance, he says, are

the number of raptors killed — for example, 866 griffon vultures (*Gyps fulvus*) since 2000. "It's important to know the mortality of large birds because they have a lower number of offspring. Even a small number of deaths can affect a population."

Raptors have long been a *cause célèbre* in the United States as well. The wind farms in California's Altamont pass have been cutting down golden eagles (*Aquila chrysaetos*) since they were opened in the 1980s. But Rick Koebe, president of PowerWorks, a California firm that owns turbines in Altamont, argues that this should be put into context.

"I heard that over 1,000 birds a year run into the Washington Monument. Should we tear that down? We're out here trying to do a job to save the Earth. We even save birds, since they are twice as vulnerable to pollution as humans."

Unsurprisingly enough, Koebe is against any further regulation of his industry: "If you give the Fish and Wildlife Service control over the wind-power industry," he says moodily, "there will be no more wind power." ■

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1. *Environmental Impacts of Wind-Energy Projects* National Academies of Science (2007).
2. Barrios, L. & Rodriguez, A. *J. Appl. Ecol.* **41**, 72-81 (2004).

Concern over teen suicides extends flu-drug probe

Japan is widening its investigation into whether certain influenza drugs could have dangerous side effects, including psychiatric problems and suicidal tendencies, in certain groups of people.

In March, the Japanese health ministry advised doctors that they should not prescribe teenagers the flu drug Tamiflu (oseltamivir) — made by Roche — after reports of some young people on the drug throwing themselves from buildings (see *Nature* 446, 358–359; 2007). Last week, the health ministry said that it would also look into the flu drugs Relenza (zanamivir) — made by GlaxoSmithKline — and amantadine.

A study that ended in 2006 flagged up all three drugs for their potential side effects, but found no clear evidence that Tamiflu was to blame for the teenagers' abnormal behaviour. The latest investigation is expected to report its results by this winter's flu season.

Power cut endangers marine lab experiments

An island research lab off the coast of California scrambled to save a number of marine experiments earlier this month because it had no back-up generators when an unexpected wildfire shut down power.

The Wrigley Marine Science Center, on Catalina Island about 30 kilometres from Los Angeles, lost power shortly after the 10 May brush fire burned down power poles. Operated by the University of Southern California, the centre's biggest loss was

about 100 million oyster larvae, which were being used in a genomics study to examine gene expression in various environments. With power out, electrical seawater pumps could not be operated, so the larvae were put to sea.

Staff members imported boatloads of dry ice to save a decade's worth of frozen specimens.

US gives green light to rice with breast-milk proteins

The US Department of Agriculture (USDA) has approved one of the first large-scale plantings of a food crop genetically modified to contain human proteins. The crop will be planted in Kansas.

Ventria Bioscience in Sacramento, California, has made strains of rice that produce proteins found in breast milk — lysozyme, lactoferrin and human serum albumin. Ventria says it aims to use the rice to make drinks that can combat diarrhoea, and dietary supplements to treat anaemia.

The USDA approved the crop after receiving 29 positive comments from the public and 20,005 negative ones. In the end, the department decided that fears the rice would escape into the environment or the food supply were not warranted.

Telescope on a plane takes to the skies — at last

After years of being grounded by budgetary delays, the US/German Stratospheric Observatory for Infrared Astronomy (SOFIA) is getting airborne at last.

The 2.5-metre telescope is mounted aboard a Boeing 747 that will fly above



C. THOMAS/NASA

Airborne observatory SOFIA is several years late.

atmospheric water vapour. NASA rededicated the plane, the *Clipper Lindbergh*, on 21 May, the eightieth anniversary of Charles Lindbergh's solo flight across the Atlantic.

In the past month SOFIA has successfully completed its first two test flights, says Eric Becklin, chief scientist for the project at the Universities Space Research Association, the Columbia, Maryland-based nonprofit organization overseeing the project.

SOFIA, which cost US\$700 million, will soon move from Waco, Texas, where it was built, to NASA's Dryden Flight Research Center at Edwards Air Force Base in California, for further tests. It is expected to make its first science observations in early 2009.

Creationist museum to open in Kentucky

American families looking for an educational activity this summer could find themselves lured into the newest and splashiest museum in Petersburg, Kentucky — a \$27 million Creation Museum.

Minister Ken Ham and his Answers in Genesis group say they built the museum as a counterpoint to traditional science and natural-history museums. Exhibits include baby *Tyrannosaurus* playing with human children, and a reproduction of part of the Grand Canyon, explained as being formed by Noah's flood.

There is a Museum of Creation and Earth History in Southern California, but the Kentucky museum is larger and expects to draw families on themed outings.

Protesters are planning a 'Rally for Reason' at the museum's 28 May opening. Science advocates have complained, saying the museum misrepresents scientific understanding of Earth history.

Correction

The News story 'Wind farms' deadly reputation hard to shift' (*Nature* 447, 126; 2007) said that on average each wind turbine kills 0.03 birds every year. In fact, this is the figure only for birds of prey. The overall average for all birds is 4.27 deaths per turbine per year.

Virtual journey to the centre of the Earth

The Earth Simulator Center in Yokohama, Japan, has a new attraction along with its supercomputer: a mini-theatre that will allow scientists to interact with data in three dimensions.

The theatre extends the experience of working with complex dynamic systems. "You can place a massless virtual dust particle in the middle of a typhoon and watch what happens to it in the same way that a golf player drops grass to test the wind," says Akira Kageyama, a simulation specialist at the centre. He hopes the facility will open to all Earth Simulator users in the near future.

Visitors have been known to duck to avoid oncoming objects thrown by a virtual typhoon or even to run into the walls while viewing the inside of Earth's core.

