



By Carolyn Raffensperger

Say It Loud: Noise Pollution Hurts, Kills

Part of our common heritage is the acoustic ecology, the soundscape of geologic forces and living things in concert. Animals use sound to signal power, warn off predators, and define the family or feeding guild. Frogs use their croaking choir to mask the location of any individual, making it harder for owls and coyotes to identify one prey. Whale song can change from season to season, adding choruses, rewriting verses, refining the melody. Bats echolocate dinner. Moths, many bats' favorite prey, have evolved strategies like fuzzy wings that absorb bat signals, or making sounds that (falsely) advertise that they are poisonous to bats.

But the sonic landscape is under siege from human activities that threaten the tranquility of national parks, the survival of marine mammals, and the capacity of human children to learn. I write this on a day when a National Guard helicopter is flying over my house, a car alarm is going off repeatedly, and two neighbors are mowing their lawns. There ought to be a law.

Actually, there is a law, or at least there was one. In the 1970s, under the Noise Control Act, EPA established 70 decibels as a safe average for a 24-hour day. "Safe" is a measure of hearing threat and does not account for other human health problem like stress or loss of sleep. Under OSHA standards, workers can be exposed to up to 85 dB for eight hours. (Decibels are calculated on a logarithmic scale, so 85 is *much* higher than the 70 considered safe under the NCA.) Employers are required

to administer a hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels.

Much of the concern about noise pollution, including the NCA, has been related to airports and aircraft. In June, the medical journal *Lancet* published a report by British researchers that said that school children ages 9-10 exposed to high levels of aircraft and traffic noise suffered delays in reading age of up to two months for every five-decibel increase in aircraft noise. The children experienced increased stress, and reduced quality of life, although paradoxically their memories improved.

Planes are not just disturbing schools but national parks. The tourist flights over the Grand Canyon have been so noisy that in 1987 Congress directed the Federal Aviation Authority and the National Park Service to achieve "natural quiet" which, after much wrangling, is now defined as when half of the park is free of aircraft noise 75 percent to 100 percent of the time. In 2000 the FAA issued a rule limiting commercial air tours in the designated Grand Canyon National Park Special Flight Rules Area. This year, the agencies, the industry, and environmentalists have entered into a mediated dispute resolution process to decide how to further regulate the noise pollution in the canyon. In addition, scientists will be measuring natural ambient sound in five vegetation zones during 2005. These data will be combined with the FAA tour flight data and radar to evaluate noise pollution and assess a predictive model. The question is how successful have the FAA and the Park Service been at restoring natural quiet?

Natural quiet isn't important just for the pleasure of tourists, but also for the creatures who call the parks home. Scott Creel, a biologist at Montana State University, and his colleagues documented fecal glucocorticoid hormone stress levels in Yellowstone Park elk and wolves. They found that these stress hormones increased with proximity to snowmobile noise. Creel also observed the stress hormones declining in Voyageurs Park wolves

correlated with a 37 percent decline in snowmobile traffic between 1998 and 2000.

For some creatures artificial sound can go beyond elevated stress hormones and result in death. In early 2000, 16 beaked whales beached themselves in the Bahamas in a mass stranding that the Navy linked to mid-frequency sonar. Another mass die-off of whales occurred later that year in the Canary Islands, following naval operations by U.S. and NATO warships.

In early June, the Natural Resources Defense Council brought the latest in a series of suits in U.S. District Court over the impact of military sonar on whales. NRDC sought information from the National Marine Fisheries Service, which is housed in the Department of Commerce. NRDC was using the Freedom of Information Act to obtain information about recent strandings and deaths of marine mammals.

At the time of the suit NMFS had only provided 12 documents, about 25 pages worth, in response to the FOIA. Among materials sought by NRDC are documents relating to a mass whale stranding along the Outer Banks of North Carolina in January. NRDC believes that the NMFS is hiding "box-loads of data that show the devastating impact of military sonar on whales." The Navy's sonar systems generate sound of extreme intensity to locate objects in the ocean. NRDC said, and bioacousticians concur, sonar can injure and kill marine mammals, which have extraordinarily sensitive hearing.

At issue in these suits is the murky confluence of national security and the environment. The Bush administration's attempts to exempt military activities from environmental regulation was rebuffed by a federal judge in 2002, who rejected arguments that sonar use was exempt from the National Environmental Policy Act.

"To most people, noise and power go hand in hand," former Secretary of the Interior James Watt once said. I wonder if Watt knew the word noise comes from the Latin word "nausea."

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