

# WILDLIFE AND WIRELESS: POLICY IS NEEDED TO PROTECT FLORA AND FAUNA

**Escalating levels of wireless RF\* radiation from the proliferation of 4G and 5G telecommunication antennas pose serious risks to wildlife and the natural world. Accumulating research studies have found numerous adverse effects at levels much lower than the U.S. Federal Communication Commission (FCC) legal limits and ICNIRP limits for cell tower emissions.**

## No Safety Standards

The FCC's federal exposure limits were designed for humans, not wildlife. "Safe" levels of RF exposure for wildlife and plants have never been developed by any scientific or government entity.

## Serious Regulatory Gaps

There is no U.S. federal agency measuring or monitoring the current levels of RF in the environment, monitoring the scientific research or gathering data on wildlife impacts from wireless infrastructure.

## No Environmental Review

There has been no review of the environmental impact of the 5G infrastructure buildout which the FCC states will require 800,000 new wireless "small" cells.

## Higher Exposures

Birds, insects and other airborne species fly, nest and perch close to transmitting antennas. "Small" cells and cell towers emit plumes of RF radiation which can greatly exceed FCC limits, even when measured at distances 10 to sometimes over 40 feet away from the antennas. Yet base station antenna emissions are "legal" because telecom compliance tests *for RF only consider areas inhabited by people*. Wildlife habitat is ignored.

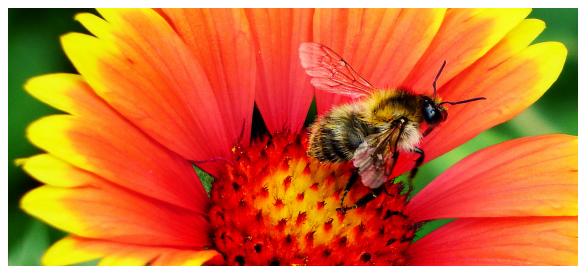
## Pollinators at Risk

5G networks will include higher frequencies — submillimeter and millimeter waves — which *studies* have found uniquely absorb at higher intensities into the bodies of bees and insects. Studies on bees and other insects have long linked cell tower frequencies and EMF exposure to increased stress, decreased honey production, memory impacts, and altered pupal development ([Thill et al. 2023](#)).

## Damage to Tree Canopy

Trees are being cut down, aggressively trimmed and their roots disturbed to build "small" cell infrastructure. A ten-year *field study* found damage to trees after years of RF exposure from cell antennas ([Waldmann-Selsam et al 2016](#)).

**The need for regulatory action is urgent. Immediate steps must be taken to reduce environmental levels of RF and develop safety standards to ensure wildlife and their habitat are protected now and in the future.**



***"In addition to its impact on humans, radiofrequency radiation poses harmful effects to flora and fauna."***

*— Natural Resources Defense Council Amicus Brief in EHT et al. v the FCC*

\*RF = radiofrequency EMF = non-ionizing electromagnetic fields including extremely low frequency

# SCIENCE ON FLORA, FAUNA, WIRELESS AND NON-IONIZING RADIATION

## The Science is Adequate To Trigger Regulatory Action To Protect Wildlife

A landmark research review on wildlife by U.S. experts of over 1,200 studies entitled “Effects of non-ionizing electromagnetic fields on flora and fauna” published in *Reviews on Environmental Health* found adverse effects from EMF\* exposure at very low intensities, including impacts to orientation and migration, reproduction, mating, nest, den building and survivorship (Levitt et al., 2021). Effects were found in all species studied.

“A review of the ecological effects of RF-EMF” published in *Environment International* found RF had a significant effect on birds, insects, other vertebrates, other organisms and plants in 70% of the studies. Development and reproduction in birds and insects were strongly affected (Cucurachi et al., 2013).

Scientific evidence indicates that EMFs should be “considered seriously as a complementary driver for the dramatic decline in insects, acting in synergy with agricultural intensification, pesticides, invasive species, and climate change” (Balmori, 2021).

A 2022 Oregon State University study investigated the long-term behavioral effects to zebrafish from short-term exposures to 5G’s midband 3.5 GHz. The researchers found “subtle but significant abnormal responses...that suggest potential long-term behavioral effects,” and they concluded, “Overall, our study suggests the impacts of RFRs on the developing brain, behavior, and the metabolome should be further explored” (Dasgupta et al., 2022).

## U.S. RF Exposure Limits: Unchanged Since 1996

The U.S. has among the most lenient rules regarding allowable RF emissions from cell towers. Many countries, such as Italy, Switzerland, Israel, China, Russia and India, have environmental RF limits 10 to 100 times lower (more stringent). India dropped its RF limits to 1/10th of U.S. limits after an Inter-Ministerial Committee set up by the Ministry of Environment and Forests reviewed the research on birds, bees, plants and animals and found the majority of studies found impacts.

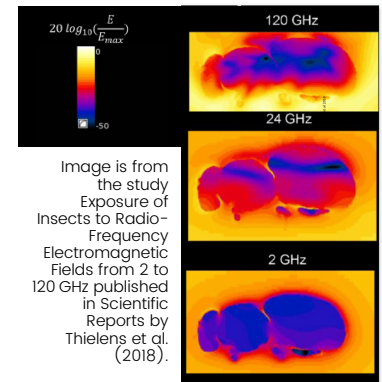
However, none of these countries have safety standards based on science identifying a “safe level” for wildlife and plants.

**“The electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today.”**

– U.S. Department of the Interior 2014 letter detailing studies showing impacts to birds from cell tower radiation.

**“The Federal Communications Commission also completely failed even to acknowledge, let alone respond to, comments concerning the impact of RF radiation on the environment.”**

– U.S. Court of Appeals for the D.C. Circuit Ruling in EHT et al. v. FCC



This is an image of the normalized electric field strength (dB) into a Western Honey Bee at various wireless frequencies. It shows that as the wavelengths are higher (as will be used in 5G) the absorption in the bodies of insects also increases, even when the power is the same.

## Norway Maple Tree, Damaged by Cell Antennas



Side facing the RF transmitter: 2,100  $\mu\text{W}/\text{m}^2$       Opposite side: 290  $\mu\text{W}/\text{m}^2$



Image: Tree Observation Guide by Helmut Breunig 2017.

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# FACTSHEET: EMFS, WILDLIFE AND THE ENVIRONMENT

## SCIENTIFIC RESEARCH

### SCIENTIFIC REVIEWS

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Kaur, S., Vian, A., Chandel, S., Singh, D. H., Batish, D., & Kohli, R. (2021). [Sensitivity of plants to high frequency electromagnetic radiation: Cellular mechanisms and morphological changes](#). *Reviews in Environmental Science and Bio/Technology*, 20.

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Levitt, B. B., Lai, H. C., & Manville, A. M. (2021). [Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment](#). *Reviews on Environmental Health*, 37(1), 81–122.

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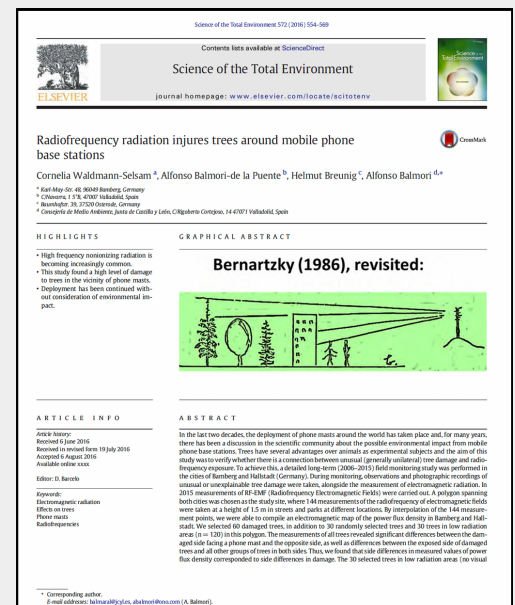
Jérémy S. P. Froidevaux, Laura Recuero Virto, Marek Czerwiński, Arno Thielens, and Kirsty J. Park (2023) [Addressing Wildlife Exposure to Radiofrequency Electromagnetic Fields: Time for Action](#) *Environmental Science & Technology Letters*

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Sivani, S, and D. Sudarsanam. (2012): ["Impacts of radio-frequency electromagnetic field \(RF-EMF\) from cell phone towers and wireless devices on biosystem and ecosystem-a review"](#). *Biology and Medicine* 4, no. 4 202-216.



“Tree damage caused by mobile phone base stations 2021”



Waldmann-Selsam, C., et al. “Radiofrequency radiation injures trees around mobile phone base stations.” *Science of the Total Environment*, 2016



International Conference on Trees and Electromagnetic Radiation