



## **Wireless Environmental and Agricultural Risks Warning Letter**

Prepared by Kirstin Beatty June of 2019

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### **General Statement: Rolling Back Wireless and Electromagnetic Exposures**

While halting all wireless emissions at once would be impossible, we must remove incentives for wireless communications, discourage further wireless infrastructure, and set up a hard-wired alternative system for communications and research whether safer wireless systems exist.<sup>1</sup> We can ban unnecessary new technologies and products, such as 5G, small cell towers, or use in children's toys. We can register wireless facilities, in order to inform the public.

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<sup>1</sup> The cellular network is incredibly more energy intensive than wired communications, and our spiraling digital device usage has offset any energy savings. For a relevant summary, see Kris De Decker's "Why we need a speed limit for the internet" published online at Resilience (dot org) October 21, 2015.

Doctors can inform patients of health risks and discourage use. Patients complaining of worsening symptoms around electromagnetic exposures can be considered seriously and measures taken to abate symptoms.

Electricity is part of the electromagnetic spectrum alongside wireless. The risks of shielded electricity may not usually be as great as existing wireless, but more research is needed to understand health risks and safety. In terms of electricity, we can design electrical systems with reduced or safer emissions and we can encourage the use of less electricity or safer use, thus generating fewer exposures. The United Kingdom Department of Health did set up a Stakeholder Advisory Group on ELF EMFs (SAGE) which has released a report with several recommendations meant to reduce health risks near high-voltage lines; the UK nonprofit Powerwatch has commentary and may offer advice on the subject.<sup>i</sup> Additionally, direct current may be safer, and simultaneously more reliable, or fifty hertz safer.

### **Wireless Impacts on our Environment and Agriculture**

Risks to health from wireless or electricity exposures may wrongly be assumed to be psychologically-derived or a problem belonging only to other people, rather than oneself. However, electromagnetic exposures impact all life, including the environment on which we depend for sustenance.

Existing honeybee studies have shown wireless causes hive desertion,<sup>ii</sup> stress,<sup>iii</sup> and curtails honey and egg production.<sup>iv</sup> Hive desertion has mimicked Colony Collapse Disorder, with worker bees leaving behind the queen and honey. Studies as far back as the 1970s have reported that the navigational abilities of bees is disturbed by high-voltage lines. High-voltage lines are also a component of the electromagnetic spectrum. A recent experimental study observed high-voltage lines may reduce pollination efficiency by causing changes in memory, learning, motor and foraging ability.<sup>v</sup>

A USDA yearly survey reports from 2017-2019 honeybee colony losses of **51%** for backyard beekeepers, compared to **23%** of losses a decade prior (2007-2008).<sup>vi</sup> Wild bees are also showing losses: from 2008 to 2013, wild bee diversity dropped 23%.<sup>vii</sup> We need bee diversity. Pollinator diversity insures flowers of different shape, color and size are pollinated.

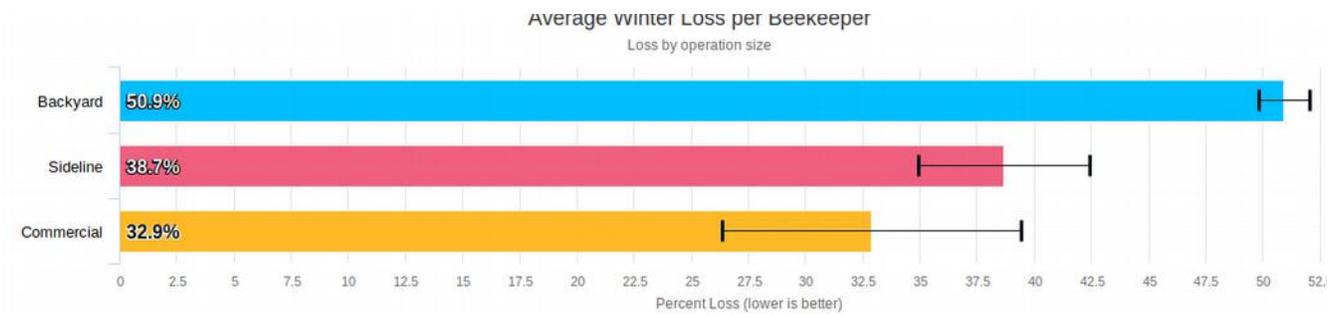


Illustration 1: 2017-2018 Honeybee losses by operation size (USDA Animal Plant Health Inspection Service (APHIS) Honey Bee Survey, a comprehensive examination of colonies throughout the US)

Studies on other insects demonstrate similar or other types of electromagnetic harm, underlining the risks. A 2013 review of 55 ecological studies found the percentage of studies finding wireless effects “highest for plants (90%) and insects (90%).”<sup>viii</sup> A 2010 review for the Ministry of Environment and Forests in India noted more than 80% or near 90% of studies indicating wireless impacts on bees and plants.<sup>ix</sup> If this were not enough of an impact, additional research suggests higher frequencies used for 5G will cause thermal effects, or heating, of some insects: this may damage insect parts.<sup>x xi</sup> For context, since three decades, insects have declined by 75%.<sup>xii</sup>

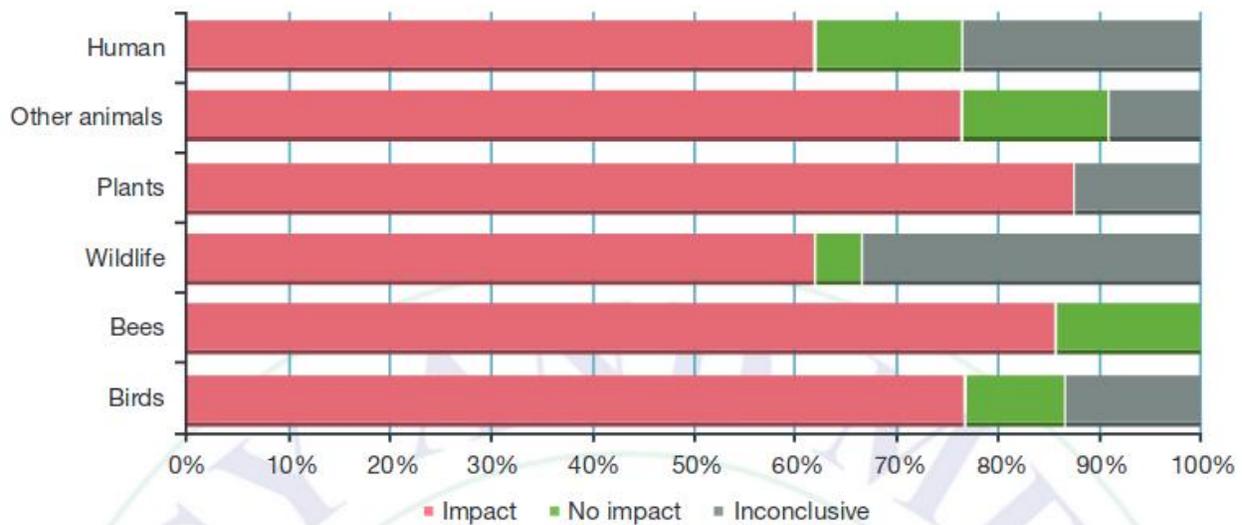


Illustration 2: Percentage of studies reported harmful effect of EMR [wireless] in various groups of organisms in 919 studies, MOEF Report (2010).

A 2016 review of wireless impacts on plants includes, among a long list of impacts, interference with photosynthesis, gene expression modification, and

inhibition of germination and growth.<sup>xiii</sup> If this were not enough, recent findings indicate cell towers can alter the soil in a way likely to cause “soil infertility” and a “reduction in yield and productivity of crops.”<sup>xiv</sup>

We cannot afford to harm or lose plants or insects. We cannot afford losses in plant growth. We depend on plants as the lungs of the planet, storing carbon, lowering temperatures, providing habitat, clean water and food.

Scientists have observed that rain forest trees are experiencing slower growth and greater mortality; they are not replenishing at a rate equal to losses nor absorbing carbon dioxide at expected rates.<sup>xv xvi</sup> Trees are dying more swiftly than replacements are born. The rain forest, in tune with El Niño, plays a major role in stabilizing climate. Global warming of 2° Celsius is expected to cause loss of 20-40% of the rain forest.<sup>xvii</sup> By 2050, temperatures are expected to meet or exceed this 2°C rise. Large old trees are in global decline: disappearing.<sup>xviii</sup>

What is not considered are the impacts of wireless communications on tree and plant growth and mortality. A 2016 study documents 60 trees, of 700 visited, that showed “damage patterns not attributable to diseases, pests, drought, or other environmental factors” and where trees were in areas of high wireless exposure: damage included dead branches, stunted growth, death of the main trunk, and “prematurely yellow or brown” leaf edges in ranges of 80 to 100% of species.<sup>xix</sup>

Climate change is expected to interfere with plant growth by interfering with photosynthesis. Climate change is expected to stunt the growth of trees. Wireless can do the same and more.

The previously mentioned study on soil infertility also noted a rise in soil bacteria resistant to antibiotics. A 2016 study also noted millimeter frequencies, or higher 5G frequencies, alter bacteria properties in way likely to induce antibiotic resistance.<sup>xx</sup> There are consequences to using wireless communications which are still being studied, but we do not know what we do not know. How might bacterial changes impact natural plant or mammal resistance, for example?

Then, for those that love not just trees, but mammals, many research studies indicating harm have actually been carried out on wildlife or lab animals, often finding detrimental impacts on birds, mice, and rats. In addition to asynchronous growth (large and small) and poor coordination, one 2010 study showed 90%

mortality of frog eggs and tadpoles exposed to mobile cell phone antennae 140 meters distant.<sup>xxi</sup>

Opponents *might* say contrary research exists. However, one does not drink a substance when 60 to 90 of 100 clearly become ill drinking the substance or the effect is unknown. The majority of studies show clear biological impacts, often detrimental. Of the existing thousands of studies from past and present and around the world, to think so many researchers are wrong is foolish. There is a pattern of harm, regardless if it can be proven for any one species or disease. Too many things have not been investigated, indicating a failure of due diligence, and nevertheless enough research exists to show a clear threat exists.

- i SAGE. Powerwatch. Available at <https://www.powerwatch.org.uk/elf/sage.asp>
- ii Sainudeen, Sahib.S. (2011) Electromagnetic Radiation (EMR) Clashes with Honey Bees. *International Journal of Environmental Sciences*,.1(5). Available at <http://www.ipublishing.co.in/jesvol1no12010/EIJES2044.pdf>
- iii Favre, Daniel. (2011) Mobile phone induced honeybee worker piping. *Apidologie*. 42: 270-9. Available at <https://link.springer.com/article/10.1007%2Fs13592-011-0016-x#page-1>
- iv Sharma, V.P. and N.K. Kumar. (2010) Changes in honeybee behaviour and biology under the influence of cellphone radiations. *Current Science*. 98(10):1376-8. Available at <https://www.emf-portal.org/en/article/18302>
- v Shepherd S, Lima MAP, Oliveira EE, Sharkh SM, Jackson CW, Newland PL (2018) Extremely Low Frequency Electromagnetic Fields impair the Cognitive and Motor Abilities of Honey Bees. *Sci Rep*. 8 (1): 7932. doi:10.1038/s41598-018-26185-y Available at <https://www.emf-portal.org/en/article/35181>
- vi Report: Loss by operation size. Description: Average winter colong loss reported by backyard beekeepers (managed fewer than 50 colonies), sideline beekeepers (managed between 51 and 500 colonies) and commercial beekeepers (managed more than 500 colonies). National Management Survey. Bee Informed Partnership. Available online at <https://bip2.beeinformed.org/survey/>
- vii Koh, I., Lonsdorf, E. V., Williams, N. M., Brittain, C., Isaacs, R., Gibbs, J., & Ricketts, T. H. (2016). Modeling the status, trends, and impacts of wild bee abundance in the United States. *Proceedings of the National Academy of Sciences of the United States of America*, 113(1), 140–145. doi:10.1073/pnas.1517685113
- viii S.Cucurachi, W.L.M.Tamis, M.G.Vijver, W.J.G.M.Peijnenburg, J.F.B.Bolte, G.R.de Snoo. (2013) A review of the ecological effects of radiofrequency electromagnetic fields (RF-EMF). *Environment International*. 51:116-140
- ix Cited by S Sivani, D Sudarsanam, Department of Advanced Zoology and Biotechnology, Loyola College, Chennai, Tamil Nadu, India (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 (4): 202–216. Available online at [http://www.biolmedonline.com/Articles/Vol4\\_4\\_2012/Vol4\\_4\\_202-216\\_BM-8.pdf](http://www.biolmedonline.com/Articles/Vol4_4_2012/Vol4_4_202-216_BM-8.pdf)
- x Arno Thielens, Duncan Bell, David B. Mortimore, Mark K. Greco, Luc Martens & Wout Joseph, Exposure of Insects to Radio-Frequency Electromagnetic Fields from 2 to 120 GHz, *Scientific Reports* volume 8, Article number: 3924 (2018) Available at <https://www.nature.com/articles/s41598-018-22271-3>
- xi Kostoff R, Personal communication with Kirstin Beatty, May 2019
- xii Hallmann et al. (2017) Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, Stenmans W, Müller A, Sumser H, Hören T, Goulson D. More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLOS ONE*. 2017;12:e0185809 doi: 10.1371/journal.pone.0185809.
- xiii Vian A, Davies E, Gendraud M, Bonnet P (2016) Plant responses to high frequency electromagnetic fields. *Biomed Res Int*. 2016: 1830262. Available at <https://www.emf-portal.org/en/article/29052>
- xiv EA Adebayo, AO Adeeyo, AA Ayandele, IO Omomowo (2014) Effect of Radiofrequency Radiation from Telecommunication Base Stations on Microbial Diversity and Antibiotic Resistance. *Journal of Applied Sciences and Environmental Management*. 18(4) <http://dx.doi.org/10.4314/jasem.v18i4.16> Available at <https://www.ajol.info/index.php/jasem/article/view/112366>
- xv Brienen, R. J. W., Phillips, O. L., Feldpausch, T. R., Gloor, E., Baker, T. R., Lloyd, J., & Zagt, R. J. (2015). Long term decline of the Amazon carbon sink. *Nature*, 519, 344–348. <https://doi.org/10.1038/nature14283>
- xvi Adriane Esquivel-Muelbert et al. Compositional response of Amazon forests to climate change. *Global Change Biology*, 2018; DOI: 10.1111/gcb.14413
- xvii Adam D (2009 Mar 11) Amazon could shrink by 85% due to climate change, scientists say. *The Guardian*. Available at <https://www.theguardian.com/environment/2009/mar/11/amazon-global-warming-trees>
- xviii Main, D. (2012 6 Dec) Big, old trees in decline world wide. *LiveScience*. <https://www.livescience.com/25310-big-trees-in-decline.html>
- xix Waldmann-Selsam C; Balmori-de la Puente A; Breunig H; Balmori A (2016) Radiofrequency radiation injures trees around mobile phone base stations. *Sci Total Environ*. 2016: 572:554-569 (ISSN: 1879-1026) Available at [https://www.researchgate.net/publication/306435017\\_Radiofrequency\\_radiation\\_injures\\_trees\\_around\\_mobile\\_phone\\_base\\_stations](https://www.researchgate.net/publication/306435017_Radiofrequency_radiation_injures_trees_around_mobile_phone_base_stations)
- xx Diana Soghomonyan Karen Trchounian Armen Trchounian (2016) Millimeter waves or extremely high frequency electromagnetic fields in the environment: what are their effects on bacteria? *Applied Microbiology and Biotechnology*. 100(11): 4761–4771 <https://doi.org/10.1007/s00253-016-7538-0>
- xxi Balmori, A (2010) Mobile phone mast effects on common frog (*Rana temporaria*) tadpoles: the city turned into a laboratory. *Electromagnetic Biology and Medicine*. 28:31-35. <https://doi.org/10.3109/15368371003685363> Available at <https://pdfs.semanticscholar.org/7bc5/0401da3ae9a5589893a08d49792c605002d3.pdf>