Expert Environmental and Agricultural Wireless Risks Letter

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,[i] stress,[ii] and curtails honey and egg production.[iii] 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.[iv]

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). [v] Wild bees are also showing losses: from 2008 to 2013, wild bee diversity dropped 23%.[vi] We need bee diversity. Pollinator diversity insures flowers of different shape, color and size are pollinated.

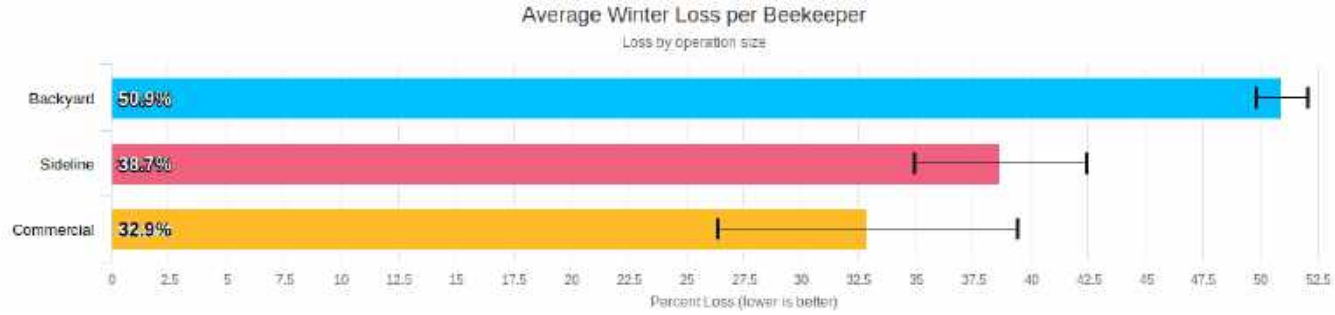

Illustration 1: Illustration 1: 2017-2018 Honeybee losses by operation size (USDA Animal Plant Health Inspection Service (APHIS) Honey Bee Survey, a comprehensive examination of colonies throughout the US)

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%)."[vii] 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.[viii] 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.[ix] [x] For context, since three decades, insects have declined by 75%.[xi]

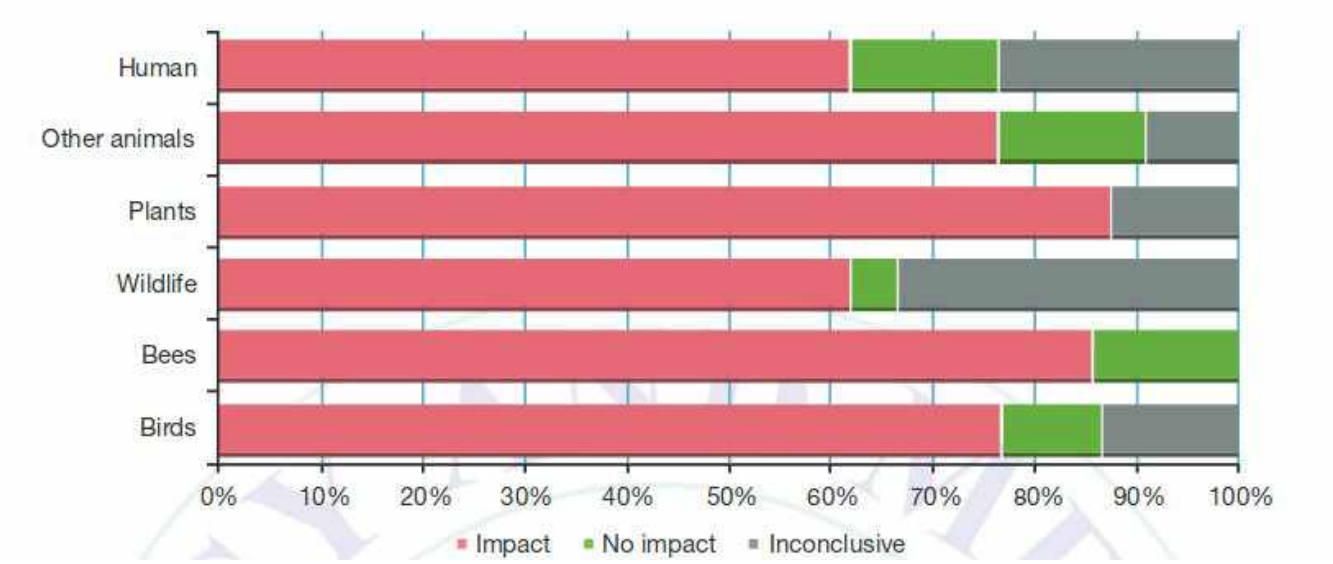

Illustration 2: Percentage of studies reported harmful effect of EMR [wireless] in various groups of organisms in 919 studies, MOEF Report (2010).

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.[xii] 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."[xiii]

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.[xiv] [xv] 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.[xvi] By 2050, temperatures are expected to meet or exceed this 2°C rise. Large old trees are in global decline: disappearing.[xvii]

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.[xviii]

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.[xix] 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.[xx]

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.

Expert Signatures:

Dr. Alfonso Balmori, Ph.D., Biologist,
Consejería de Medio Ambiente Junta de Castilla y León, Spain

Dr. Daniel Favre, Doctor philosophiae naturalis,
(Association Romande Alerte), Switzerland

Dr. Olle Johansson,Ph.D., Retired Experimental Dermatology Unit,
Dept. of Neuroscience, Karolinska Institute, Sweden

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