

Date: March 11, 2023

[Testimony 5G Technology Bill-AMM.docx]

To: Members of the Committee on Energy, Utilities and
Technology (EUT)

From: Dr. Albert M. Manville, II; Certified Wildlife Biologist;
Retired Supervisory/Senior Wildlife Biologist, Div.
Migratory Bird Management, USFWS (17 yrs); Senior
Lecturer and Adjunct Professor, Advanced Academic
Programs, Johns Hopkins Univ. (23 yrs); Greenville
Jct., ME 04442 residence

Re: Testimony on LD 697 — Resolve, to Study the Effects of
5G Technology on Bird, Bee and Insect Populations and
the Effects of Long-term Exposure on Children

Sen. Lawrence, Rep. Zeigler, and Members of the EUT Committee. Thank you for the opportunity to provide my brief written testimony regarding LD 697 which I submit for the administrative record.

I am Albert M. Manville, Ph.D., a Certified Wildlife Biologist (by The Wildlife Society), and a full-time resident of Maine. I served for 17 years as a Branch Chief and then Senior Wildlife Biologist for the Division of Migratory Bird Management, U.S. Fish & Wildlife Service, HQ Office, retiring in 2014. I was my agency's national lead on all structural things impacting migratory birds. This included radiation from cellular and other broadcast towers, so-called "smart" technology devices, and related sources of non-thermal, radio frequency radiation (RFR) impacting birds and other wildlife. I also continue to teach part-time as a Senior Lecturer and Adjunct Professor for the Advanced Academic Programs, Johns Hopkins University, including teaching graduate field classes (one in Maine) with a section on impacts to wildlife from structural collisions, electrocutions, and electromagnetic frequencies (EMF). Until recently I ran a wildlife consulting LLC, addressing impacts from cellular tower bird collisions and radiation. I have published extensively on tower collision and radiation issues and concerns, among numerous other issues.

We are subjecting ourselves and all other living organisms — i.e., plants and animals, including the myriad species of wildlife, inclusive of birds, bees and beneficial insects — to this electro-smog. It impacts us 24/7. EMF now needs to be classified as an environmental pollutant and addressed accordingly. LD 697 will begin to deal with one aspect of this radiation — the growing threats from radiation frequencies of the millimeter wavelengths, the so-called 5G technology. Maine residents deserve to receive the most current and best available scientific information, recommendations for addressing best management practices to deal with effects of non-thermal radiation, and current facts about this 5G technology — not the industry hype presented ad nauseum in advertising on the radio, television, and electronic media. Some of Maine's residents, including my wife and I, are sensitive to EMF and need to know causes and consequences from the effects of this non-thermal radiation, and how best to address them. LD 697 could clearly help.

I've had the distinct pleasure of co-authoring a 3-part, peer-reviewed scientific paper published in 2021 in *Reviews in Environmental Health* (Levitt *et al.* 2021, with the cites and links referenced at the end of this testimony) on "The effects of non-ionizing electromagnetic fields on flora and fauna." It represents to date the most comprehensive review of some 1,000 peer-reviewed scientific papers assessing impacts from non-thermal, non-ionizing radiation on plants and animals, including research conducted by Ms. Levitt, Dr. Lai and myself. We evaluated 5G in detail in our paper, although we have much to learn about

likely impacts. In 2022, I co-authored a prospectus review in *Frontiers in Public Health* on an ecosystem approach to radiation impacts to plants and animals (Levitt *et al.* 2022; cite attached). I also am senior author of a paper on the pros and cons of using radio tracking devices on/in wildlife, currently submitted for publication but not yet accepted.

I am testifying in **favor** of LD 697, as amended, and recommend it be further amended to appoint an independent commission to oversee the proposed study and ideally help release subsequent, follow-up information about the results to the public. The model for establishing a commission regarding 5G has already been implemented in New Hampshire. To be clear, LD 697 must stipulate that all commission members have **no** vested interest in the study outcomes, be willing to present the current and best scientific facts, be willing to challenge and call out misinformation when it arises, and have no ties financially and/or professionally to the telecommunications industry or its consultants. Otherwise, any recommendations and/or study outcomes could be biased. A voluntary independent commission to oversee the study and provide outreach would be preferable and more cost effective than what was proposed in the original language of the bill.

Lin et al. (2023; doi: 10.1016/j.coesh.2023.100456) just published a study on “Exposures to radio-frequency electromagnetic fields and their impacts on children's health – What the science knows?”, in *Current Opinion in Environmental Science and Health*. The authors systematically reviewed epidemiological studies, and briefly reviewed the experimental animal or mechanistic studies used to evaluate the evidence for possible adverse non-thermal health effects on children. They used a search strategy and risk-of-bias assessment, summarizing existing data on cancer, birth outcome, neurocognitive development, and behavioral problems. Their conclusion: there was no sufficient evidence to determine adverse effects. However, this meta-review did not include adverse impacts from 5G which have yet to be determined let alone evaluated in children as well as in wildlife. Moreover, they did acknowledge that recent large-scale animal studies — such as what we reference in Levitt *et al.* 2021 — have shown carcinogenic findings, but the biological mechanisms have yet to be explained and/or are poorly understood. Lin et al. (2023) concluded that a well-designed, future study is needed to produce high-quality scientific evidence of the possible harmful effects of RFR exposure in children. I strongly concur but would suggest that a study on non-thermal effects must also include impacts to birds, bees and other beneficial insects — as LD 697 would do. With 5G now being implemented, LD 697 could provide additional opportunities to evaluate these potential non-thermal impacts of RFR exposure on children as well as to wildlife. To be clear, it would be unethical to actually perform a study of thermal effects on humans and wildlife.

However, most effects from EMF, including 5G, are likely to be non-thermal, with extremely low levels of radiation causing such aberrations as DNA strand breaks, and effects to DNA repair mechanisms, not as a result of heat stress (thermal effects). We're witnessing biological effects seen broadly across all taxa, including at frequencies of vanishingly low intensities. Currently, the Federal Communication Commission's (FCC) RFR standards are more than 35 years out of date, still based on thermal heating — inapplicable today due to the incredibly low levels of energy causing negative impacts to plants, animals — including us — and other organisms. FCC was sued by the Environmental Health Trust et al. in 2020; FCC lost. Yet the Commission has yet to justify their RF standards, to date failing to respond to some 1,800 peer-review studies showing harm from radiation imposed on plants and animals, including humans. 5G is particularly of concern to children, fetuses, plants, insects, and small birds such as hummingbirds and small songbirds many which are summer residents here in Maine. Bees and monarch butterflies, among others, are already in trouble here in Maine and elsewhere. These millimeter wavelengths resonate with animal and plant tissues particularly of these smaller organisms whose sizes are comparable in size to the millimeter frequency lengths. Birds have hollow feathers which have piezoelectric properties, allowing millimeter waves to penetrate deep into bird body cavities, disrupting crucial biological functioning.

I've published several research study protocols on assessing impacts from communication tower bird collisions while I worked for USFWS which could be used to evaluate impacts from radiation, with some modifications. A detailed literature review of all published 5G and other radiation studies affecting humans and wildlife should also be a part of the commission's assessments and work load.

5G is extremely complex, with signaling characteristics not well studied nor understood. To add to the complexity, there has been no required environmental review of 5G under the National Environmental Policy Act (NEPA) by the FCC before its rollout, specifically requiring an Environmental Impact Statement (EIS). What the public does not realize: 5G will require millions of "small cell" antennas placed very close together — by some estimates on the roof tops of every 2-5 houses or on the street poles in front of our homes — to provide ubiquitous coverage. These radiation waves are easily attenuated and diffracted by structures requiring huge numbers of antennas. We'll see this technology in our rural communities as well.

In summary, the timing for LD 697 is excellent, and urgent. Maine residents need to know that our Legislature is trying to address a growing radiation and ecological problem, based on the existing evidence with some potentially frightening consequences. Please "vote out to pass as amended." Thank you.

Respectfully submitted.

Links to EMF and Wildlife papers 2021

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Links to 2022 papers:

- Henry Lai & B. Blake Levitt (2022) The roles of intensity, exposure duration, and modulation on the biological effects of radiofrequency radiation and exposure guidelines, Electromagnetic Biology and Medicine, 41:2, 230-255, DOI: [10.1080/15368378.2022.2065683](https://doi.org/10.1080/15368378.2022.2065683)
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Albert Manville
Greenville Junction
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