Safe ICT NZ

Safe Information and Communication Technology for New Zealand

7/11/21
Submission on Creating a Digital Strategy, with focus on environmental effects.

Tēnā Kōrua
Our aspiration is that a Digital Strategy for Aotearoa includes recognising the science, being carried out on electromagnetic fields/frequencies' harm to other species, and protection for our unique species.

Other species are potentially more at risk from artificial electromagnetic frequencies/fields' than ourselves. We no longer rely on our magneto perception to navigate, but birds do. We do not communicate with electromagnectic frequencies, but bees do. Our body size mitigates some of the harm from electromagnetic frequencies but a native bee or butterfly does have that advantage. We move about, but trees which stay constantly within an antenna's radiation, have a chlorophyll decline that is logarithmic.

Therefore we are making four recommendations:

1. Regarding the use of radio-tracking devices (with no control animals) on endangered species. Take the trackers off the birds and protect their nests from unnatural frequencies.

New Zealand researchers are using various radio frequency tracking devices in the study of, and supposed protection of, our endangered species, when the literature reviews of the biological effects from artificial electromagnetic fields conclude that "No level above natural is safe."

We believe that the low fertility and unusual development disorders in the kakapo breeding problems can be explained by their exposure to EMF since this type of problem is well documented with similar species. We are concerned that, as with other species, continued reproductive organ damage could result in complete sterility. I will expand on this in further detail:

Abnormal embryos from exposed hens' eggs

In hen-house studies, the abnormality rate of embryos is at least doubled by the use of low electromagnetic fields in the order of 60 MHz, and 100 MHz (1). In an earlier study exposing chicken eggs to a GSM phone caused a 75% mortality rate versus the control group of sixteen deaths (2). Why would trackers using the frequencies of 138-235 MHz be any safer for kakapos, kiwis and blue penguins? Certainly, there is no research proving safety.

Obvious disorders in Kakapos also found in other wildlife telemetry

We are already seeing unusual developmental disorders, such as the dura of the Kakapo chick Esperance-1-B-19 being pushed out of its skull, and requiring surgery. There is an assumption that the Kakapo breeding problems are due to in-breeding but EMF radiation effects observed in other species would also explain what is a highly unusual disorder.

Wildlife telemetry affects survival, behaviour, orientation and sex ratio:

More male than female chicks are being found in our kakapos, and in other wildlife telemetry programmes. (3) As well as sex ratios, Alfonso Balmori's review paper on Wildlife Telemetry points out that in animals studied using wildlife telemetry, the animal's survival, orientation, and behaviour, are also affected. The weight of the device and nature of attachment are considered to have these negative effects, rather than the RF radiation. However, the detrimental results appear to be the same regardless of the weight, age, or mode of locomotion of the bird. This would suggest that something other than the weight of the tracking devices and attachment methods is causing the problems for wildlife (3).

Once again a tracked male bar-tailed Godwit has been in the news because he hasn't reached his destination. Although head winds have been blamed, both the increasing outputs of EMFs from cell phone towers etc, and the trackers cannot be ruled out. "Current evidence indicates that exposure at levels that are found in the environment (in urban areas and near base stations) may particularly alter the receptor organs ability to orient in the magnetic field of the earth." -Balmori (12).

EMFs are clearly not neutral to birds since scientists have demonstrated the ability to manipulate bird's flight direction with them (5). High frequency RF fields produced a response in many types of neurones in the avian Central Nervous System (6).

Progressive sterility

Animals with an incredibly high fertility rate, that is mice and rats, have been made sterile in three to five generations with exposure to radio frequencies. In these mouse and rat studies, both the developing fallopian tubes, and developing eggs (oocytes) were deformed by RF radiation, causing a progressive drop in the number of rodent births, and the mice and rats to quickly become sterile (7). The mice exposed to 0.168W/cm2 become sterile after five generations, while those exposed to 1.053W/cm2 became sterile after only three generations (8).

Mutation of sperm is also of concern: Dr Martin Pall says:"DNA damage known to be produced by these EMFs occur in human sperm and may also occur in human eggs, leading to large increases in mutation in any children born. It is thought that an increase in mutation frequency of 2.5 to 3-fold will lead to extinction because of accumulation of large numbers of damaging mutations. We may already be over this level, and if so, simply continuing our current exposures will lead to eventual extinction. Further increases in exposures will be more rapidly self-destructive" (9). Surely this must also apply to all species.

Stress proteins, oxidative stress, lack of immunity, and DNA damage

Apart from deformities, increased mortality, reproductive stresses, and the behavioural disorders discussed above, studies of RF exposure on other species have demonstrated the production of stress proteins (10) of oxidative stress, and of single and double strand DNA damage, (11) leading to a lack of immunity and cancers. We need to protect our vulnerable species from all of the above.

Protection of endangered species from EMF exposures is also needed

In mice, as well as sterility, fetal radiofrequency radiation exposure led to neuro-behavioral and neuro-developmental disorders such as impaired memory, hyperactivity and decreased anxiety, upon exposures to 800–1900 Mhz frequencies (8). Why would this be any different in our endangered species?

Endangered species need to be protected as much as possible from additional EMF sources as well as tracking and monitoring devices. Balmori's research on multiple bird species in an urban park, found that as the mobile base stations increased, silent areas increased, i.e., male songbirds left, eggs were abandoned, bird couples left without breeding, bird couple numbers declined, and 67% of birds suffered an important population decrease. With the decline of species which are dependent on things like: breeding height, the height of singing, feeding, nest location, and kind of nest built (12)(13), Engels et al, found

that the disruptive effects of radiofrequencies to robins was not confined to a narrow band, and that the birds tested lost their magnetic compass when exposed to the presence of urban electromagnetic radiofrequency noise in the frequency range of 50kHz–5 MHz (5).

It is simple to avoid an unrecoverable error

All of the scientists studying EMF exposure in labs shield some animals as a control. Outside of the lab this same approach needs to be taken. Harm may be being done that will not be seen until the next generation or the generation after that. Taking the trackers off the birds and out of their nests may prevent an unrecoverable error and must be done with urgency.

2. Create PROTECTION FOR THE VARIOUS NATIONAL PARKS AND SANCTUARIES containing unique species, from multifarious artificial frequencies.

Our national parks should be EMF-free spaces that can act as controls

Our national parks and other wildlife sanctuaries should be places that we can use as controls, to track the health of our ecosystems against the EMF polluted/exposed ones.

Catastrophic Insect decline

We already know that the insect population is falling eight times faster than that of larger species. New Zealand beekeepers reported that they lost more than 81,960 colonies during winter 2019 (14). New Zealand's native bee species are declining also. Ngaire Hart studying native bees in Northland found a 60% decrease over the past three years (15).

In the words of epidemiologist Dr George Carlos "The colony collapse disorder has occurred concurrently on four continents within a very short time frame. If the reason was biological or chemical, there would be a pattern of epidemic spread we would be able to trace the spread of bee disappearance or Colony Collapse Disorder from a source similar to the spread of SARS a few years ago. That is not the case. The condition has hit each continent at roughly the same time. That would mean the cause has to have hit the continents at the same time as well. Mobile phones meet that criterion."(16). Evidence for the effects of non-thermal microwave radiation on insects has been known for at least 50 years, when research on beetles recorded malformed wing-covers (17).

Bee communication disrupted by data transmission frequencies

In 1974, Russian researchers Eskov and Sapozhnikov found that bees produce frequencies between 180 Hz and 250 Hz with the help of small magnetite crystals in their rump. The data transmission of mobile communications takes place with a pulse frequency of 217 Hz and is exactly in the range of the waggle dance. This impairs the natural communication of the bees. The result: food collecting bees cannot tell each other correctly where good food sources are. Thus, the feeding of the bee colony is existentially endangered (16).

An increase of levels to above 6GHz would decimate the insect population

Research on the effects on insects finds that the closer the electromagnetic wave is in size to the insect's body size, the more the radiation penetrates and is absorbed, and conductivity increases, so the more devastating the impact. Therefore the approval of new frequencies with smaller wave sizes and installing of ultra-dense networks of transmitters

is the perfect way to fry insects and unravel the interconnected eco-system to the point of collapse. Research simulations published in Nature on insects including the common honey bee, using sophisticated computer tomography models showed that a shift of 10% of the incident power density to frequencies above 6 GHz would lead to an increase in absorbed power between 3–370% (17). A simulation of 5G frequencies on insects using models of mosquitoes found for the same incident field strength, the power absorption by the mosquito, is 16 times higher at 60 GHz than at 6 GHz causing di-electric heating (18).

Discoloured birds with feathers lacking their shine

Balmori's research frequently finds melanism, albinoism, and plumage deterioration, signalling a decline in health, as well as limping in birds, recorded in high microwave radiation (>2V/m) areas (5). In New Zealand, brown tui are being noticed. Radiation exposure may be the cause.

Other species at risk

Frogs

Our frog species are both endangered and declining. In Spain, Balmori's studies (22) showed many different kinds of serious abnormalities in the tadpoles exposed to cell tower radiation on several species of frogs. American researcher Allen H Frey found cardiac arrhythmias and sometimes cardiac arrest in frogs exposed to low-intensity non-ionizing radiation.

Bats

Native bats are notably disappearing in Blenheim, and while this has been blamed on the wine-growing industry, Balmori's research on bats in Spain shows reduced activity near cell towers (23) which would point to similar effects on our native bats species. Barry Nicholls and Paul A. Racey have found that bats can be significantly averted from areas using radar in the frequencies of 0.08 µs/2100 Hz and 0.3 µs/1200 Hz (15). Balmori's study tells us that the frequency used by bats for echolocation calls is 9–20 kHz—if this is overridden by artificial frequencies how will bats operate (24)?

Tree decline on every level

Research on EMF exposure to trees shows the death of living tissue, in the crown, leaves, trunk, and branches, (25) and tree growth tree growth decline (26). The decrease in both types of chlorophyll in trees is logarithmic to the increase in daily RF exposure time for trees in the direct path and close to antennae (beyond the distance of thermal effects) (25). Pine needle show premature aging. (27)The development of cancers under the bark are also measurable in proximity to antennae.

Soil

Research on EMF exposures on soil shows significant impacts on bacteria, fungi and enzymes and water content. Through the activities of these micro-organisms, carbon, nitrogen and other minerals are released to the soil for plants utilization. A Nigerian University study found that in exposed soil samples, the water content was significantly ($p<0.05$) lower than the mean values from the EMR unexposed samples. Similar observations were made with the mean enzyme activities (29). Another Nigerian study found that exposure to cell phone radiation at 945MHz resulted in a statistically significant drop in the numbers of bacteria and fungi. Some organisms were susceptible than others, with the potential to form, not only a loss, but also to create an imbalance in the soil biota, potentially creating dysfunction (30).

Every species that has living cells is at risk

Every living species has cells, and voltage gating controls the pores of those cells. Calcium efflux is measurable with exposure to unnatural electromagnetic frequencies. An example of

the harm is that, in all species with eyes, there is risk of blindness, cataracts, macular degeneration, glaucoma, and retinal detachment. Each of these involves excessive calcium levels in different parts of the eye and 3 of them also involve excessive voltage-gated calcium activity (31).

3. Exposure to unnatural electromagnetic frequencies must be kept as low as reasonable achievable (ALARA), and wired technologies given preference over wireless technologies.

That digital stategy vision must include education, not only on how to use or avail oneself of the technologies, but also on their mechanisms of action and how our choices as digital users impacts the environment. Education must also teach awarenss and promotion of the fact that when we use wired technologies where possible, we minimise our contribution to further unnecessary exposures to wildlife.

As a member of he United Nations Educational, Scientific and Cultural Organisation (UNESCO) we have the obligation to apply the precautionary principle.
"*Actions are interventions that are undertaken before harm occurs that seek to avoid or diminish the harm. Actions should be chosen that are proportional to the seriousness of the potential harm, with consideration of their positive and negative consequences, and with an assessment of the moral implications of both action and inaction. The choice of action should be the result of a participatory process*". (UNESCO 2005, p.14)

"*When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm." In order to protect the environment, the precautionary approach shall be applied widely by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*"
(UNCED 1992)

4. The evidence from science must be acted on.

Environmental science must be reviewed, and communicated, and mitigation of eco-system impacts planned and commenced

We must follow other countries where biological science has been followed. India dropped their RF limits by 1/10th of ICNIRP after a 2010 Government Report documented the majority of research studies found adverse effects of exposure on wildlife, birds and bees. The Russian regulators are actually the same people who do the research, and their higher/safer regulations are based, as stated by Oleg Grigoriev, the head of the Russian National Committee on Non-Ionizing Radiation Protection, not on the idea of precaution, but on measurable effects on the nervous system, cognitive function etc. Their standards are much more protective but they recognise that with increasing exposures and increasing frequencies even these are not enough.

In 2010 along with 168 countries, New Zealand signed up to the Aichi targets, promising to address the pressures on biodiversity and restore ecosystems by 2020. Not one of these targets has been met.

FCC ordered to review previously ignored material

Recently (August 2021) the American Federal Communications Commission (FCC) was ordered by the U.S. Court of Appeals for the District of Columbia Circuit to review earlier material: "The FCC completely failed to acknowledge, let alone respond to, comments con-

cerning the impact of RF radiation on the environment," the judgment states. "The record contains substantive evidence of potential environmental harms." It is now obvious that the FCC ignored decades of studies about the potential health harms of cell phone radiation and must adequately respond to the implications of the science, (including those on the environment and wildlife) before making a decision about new regulations for cell phones. The court found that FCC's decision that 1996 radio frequency emission guidelines adequately protect the public was capricious, arbitrary and not evidence based. The New Zealand situation is analogous.

In conclusion

The digital strategy for Aotearoa needs to include in its vision, the findings of (independent from industry) scientific research on the effects of wireless technologies on wildlife sand the environment. It needs to take responsibility for protecting our natural world by keeping wireless use as low as reasonably achievable. This is an urgent consideration, as the harm may in fact may be increasing logarithmically, just as the chlorophyll decline effects of radiation on trees is logarithmic. Our vision would be that using a cell phone unnecessarily would be seen as akin to using a non-reusable coffee cup or smoking inside, i.e., something we used to do before we realised the harms of such practices.

Regarding 1: The use of radio-tracking devices (with no control animals) on endangered species.

Our recommendation is that endangered species must have their trackers removed and taken out of their nests with urgency, or at the minimum, animals without trackers must provide scientific control against animals with radio tracking devices.

Regarding 2: The need for both EMF sanctuaries and spaces that can act as controls

Our recommendation is that the governmental agencies need to urgently plan and create EMF-free zones, and make our parks and reserves continue to be sanctuaries for all species. Cell towers have no place in our conservation estate, where endangered species are present, and robust processes need to be in place to ensure this.

Regarding 3: Exposure to unnatural electromagnetic frequencies must be kept as low as reasonable achievable (ALARA)

Our recommendation is that in line with the precautionary principle we are signatories to: where wireless transmission is used, the ALARA (as low as reasonably achievable) principal should be striven for, and New Zealand citizens be made cognisant of the environmental, ecological and health effects of wireless technologies.

Regarding 4. The evidence from science must be acted on

The evidence must be reviewed and communicated, and mitigation of ecosystem impacts planned for and commenced. This includes educating the public of the environmental impacts when it comes to data streaming and, for that matter, the use of crypto currencies. Both in choices of things like video resolution, and that fibre-optic cable can be up to 50 times more efficient than wireless systems (32) when it comes to power usage, thus having a direct effect on the need to create more electricity generation plants. Existing environmental laws must amended to include EMF fields as a pollutant. No new frequencies should be allocated, since it is already clear that the millimetre waves would be devastating to the insect population, which is already in such a precarious position.

Trees need to be protected. In many American regions there are rulings where a tree cannot be removed, or have its protected root zone (drip zone) impacted, or be pruned to accommodate installation or functioning of cell infrastructure. Nor can such infrastructure be placed within 5 meters of a tree.

Long-term chronic low-level EMF exposure standards, which do not currently exist, should be set accordingly for wildlife, and environmental laws should be approriately updated and strictly enforced.

Internationally, including New Zealand, biologists are calling this period of time 'the sixth extinction'. The strategy group has the ability to do some mitigation of this, if you act on your conscience. This submission mainly focuses on wildlife effects, the ongoing radiation of humans, is a topic for a separate discussion.

Sincerely, Anthea Grob
(Ms) Anthea Grob

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Wildlife telemetry affects survival, behaviour, orientation and sex ratio:

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Stress proteins, oxidative stress, lack of immunity and DNA damage

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Protection endangered species from EMF exposures is also needed

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2. Create PROTECTION FOR THE VARIOUS NATIONAL PARKS AND SANCTUARIES containing unique species, from multifarious artificial frequencies

Catastrophic Insect decline

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Frogs:

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Bats

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