

Pollution prevention, reduction, and accountability in Canada's Biodiversity Strategy  
***Addressing pesticides and non-ionizing radiation***  
Comments on the [Canadian Biodiversity Milestone](#) document

February 9<sup>th</sup>, 2024

Prevent Cancer Now welcomes progress developing Canada's Biodiversity Strategy, in the Milestone document. In this submission we focus on pollution, including pesticides, and anthropogenic (man made) non-ionizing electromagnetic fields (EMFs). We also include under separate cover a joint submission that further addresses pesticides.

Meg Sears PhD  
Chair, Prevent Cancer Now  
[info@preventcancer.ca](mailto:info@preventcancer.ca)

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Earth is sustained by complex interactions among innumerable species, great and small. Canada's biodiversity has declined over decades, eroding resilience in the natural features and processes that buffer severe weather, and underlie and sustain clean water, healthy food, and survivable habitats. This is the context of our comments on the federal [Milestone document](#), on meeting some of Canada's biodiversity goals and targets by 2030.

Announcing this important consultation, Minister Guilbeault captured the urgency:

[“... we want to bring forward the full diversity of Canadian perspectives so that we can build an ambitious and inclusive strategy. Nature cannot wait for us. We need to act now.”](#)

We cannot take for granted how we have flourished for centuries, within favourable ranges of bio-physical-chemical conditions and atmospheric composition that support life as we know it. Earth is moving out of this “Goldilocks zone,” and it is essential to reduce pollution. Pollution is characterized according to type and effects (e.g., greenhouse gases that trap heat; toxic chemicals and non-ionizing radiation that affect biochemistry and health).

Scientists have clearly, repeatedly warned of severe and even existential threats to many species—from the smallest microbes, to insects and birds—and hence threats to humankind. Over decades, laws have been passed to protect the environment, and rare and endangered species. Declarations and conventions have been signed and acted upon, or not. Clearly, they have not been anywhere near sufficient.

The Kunming-Montreal GBF is a landmark in at least three generations' efforts to research, draw attention to, and incite actions to protect and save habitat and natural systems.

Here we focus on two forms of pollutants featured among Canadians' responses in the Milestone report. These are entirely under human control: pesticides, and anthropogenic electromagnetic radiation (from "wireless" telecommunications and electrification).

## Background

In December 2022, Canada hosted thousands of international delegates at the 15<sup>th</sup> Convention of the Parties (COP15) on the Convention on Biological Diversity (CBD). Two weeks of meetings of government representatives, scientists, activists, and industrial interests focused on halting and reversing declines of species and natural systems. Canada was among 190 nations that signed the resulting 4 Goals and 23 Targets of the [Global Biodiversity Framework](#) (GBF).<sup>1</sup>

Rachel Carson's iconic *Silent Spring* (1962) reflects on how pollution, particularly pesticides, kills and impairs much more than intended targets and effects ripple throughout complex ecosystems. Concerns grew, and [Canada attended](#)<sup>2</sup> and contributed to the formulation of conventions at the [1992 Earth Summit in Rio](#),<sup>3</sup> where the [Precautionary Approach](#)<sup>4</sup> was voiced and supported.

*"Where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat."*

Global evidence that ecological limits for sustainability were being breached led to three [interlinked](#)<sup>5</sup> Conventions, on [Biodiversity](#)<sup>6</sup> as well as Climate Change and Desertification.

Many factors threaten biodiversity; the Milestone document reports 2023 survey responses concerning rapidly increasing levels of non-ionizing electromagnetic pollution as well as pesticides (*emphasis* added).

### 8. Thematic areas of the K-M GBF that Canada should prioritize ...

- policy to reduce pollution, *pesticide* use, pharmaceuticals, CO<sub>2</sub>, GHG, geoengineering
- recognizing and investigating the adverse effects of *artificially generated electromagnetic fields*

### 10. Key features for Canada's 2030 Biodiversity Strategy to be successful include ...

- *transform agri-food system ... organic farming*
- pollution reduction (e.g., fossil fuels, plastics, *EMF*, forest fires, GHG)

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## How Biodiversity Intersects With Cancer Prevention

There is no bright line between us and our environment— the air we breathe, water we drink and food that sustains us. Agents such as pesticides and “wireless” radiation are harmful to many species, including humans, and can also contribute to development of cancers.

Furthermore, many nutritious foods and other plants and fungi, including Indigenous medicines, are used to prevent and to treat ailments, including cancer. These foods and medicines are part of biodiversity, and are also at risk. Species that grow in Canada, and that are used as foods, supplements and/or remedies include:

- Reishi (*Ganoderma*), turkey tail (*Coriolus versicolor*), lion’s mane (*Hericium erinaceus*), agaricus (*Blazei* Murill), Maitake, and Shitake mushrooms are used in extracted forms to stimulate immune system function, in order to prevent and treat a wide variety of cancers.
- *Echinacea* (*E. augustifolium* and *E. purpurea*), known as purple cone flower, is a powerful immune stimulant, anti-viral and anti-fungal used to prevent cancer.
- *Berberis spp* (Oregon Grape or Barberry) is known as a natural antibiotic and liver cleanser as well as a blood sugar regulator used in prevention and treatment of cancer.
- Yew (*Taxus brevifolia*) is used in cancer treatment.
- Periwinkle (*Vinca rosea*) The cancer drug vincristine is derived from periwinkle.
- Solomon’s seal (*Polygonatum spp*) is used in cancer treatment.
- *Panax ginseng* is now cultivated in southwestern Ontario, and used for cancer prevention.
- Castor bean (*Ricinus communalis*) is used to stimulate lymphatic function in cancer prevention and treatment.

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**PESTICIDES – halving risks with alternative solutions, elimination of non-essential uses, and sustainable, resilient agriculture. *Lessons from successes. Accountability.***

Pesticides carry inherent risks that pose direct and indirect threats to biodiversity. Some examples include:

- off-target toxicity to surrounding biota, or species that frequent sprayed areas such as birds in crops;
- development of pests that are more resilient and pesticide resistant, leading to suboptimal “control,” followed by higher rates of application and more complex mixtures;
- reducing prey (food) for species that would naturally control pests (e.g., birds, amphibians and insects which prey on insect pests);
- in turn, reducing these species which act as natural controls;
- reducing soil-borne microbes that are pest pathogens, such as against grasshoppers<sup>7</sup> that were a disastrous pest in part of the Prairies in 2023; and
- effects of pesticides as well as weather on the soil microbiome. This can indirectly promote crop diseases such as *Fusarium* (that is less problematic for organic farmers).

Chemical pesticides used to “manage” / kill unwanted organisms are toxic to some life forms, by design and intent. There is a long history of assumptions being overturned and pesticides eventually being taken off the market. One notable example is DDT, that is an effective insecticide but that also disrupts hormone actions and accumulates in fatty tissues. DDT’s effects echo down generations. For example, although DDT has been banned for decades, it increases risks of breast in *granddaughters* of women who were exposed during early years.<sup>8</sup>

Pesticide assessment does not weigh possible alternatives or “essentiality” of a particular product, and inherent risks of off-target and perverse effects of pesticides are too often deemed inappropriately to be “out of scope,” or are ignored or denied until evidence eventually becomes overwhelming. Harms to off-target species are often late to be recognized, with use reduced only after extended periods of study.

After more than a century of pesticide use against inconvenient species, we face persistent pollution, declines in pollinator and bird populations, evolution of pesticide-resistant pests, genetic pollution threatening farmers and biodiversity, and multi-generational effects in humans. As pests become resistant, increasing quantities, toxicity, and complexity of pesticide spray mixtures are being used.

Canada is registering an expanding portfolio of synthetic pesticides comprised of highly concerning structures (e.g., with ring structures characteristic of endocrine-disrupting chemicals, and halogens [fluorine, chlorine and bromine] that increase toxicity and persistence). Recent fluorinated pesticides such as tiafenacil and similar active ingredients may even degrade to form trifluoroacetate, which risks ozone depletion.<sup>9</sup>

Cancer is a multi-step illness, and carcinogens are broadly harmful. As such, cancer-causing agents too commonly comprise or contaminate pesticides. Recognition and possibly eventual restriction of carcinogenic pesticides, contaminants, and degradants are usually delayed over more than a

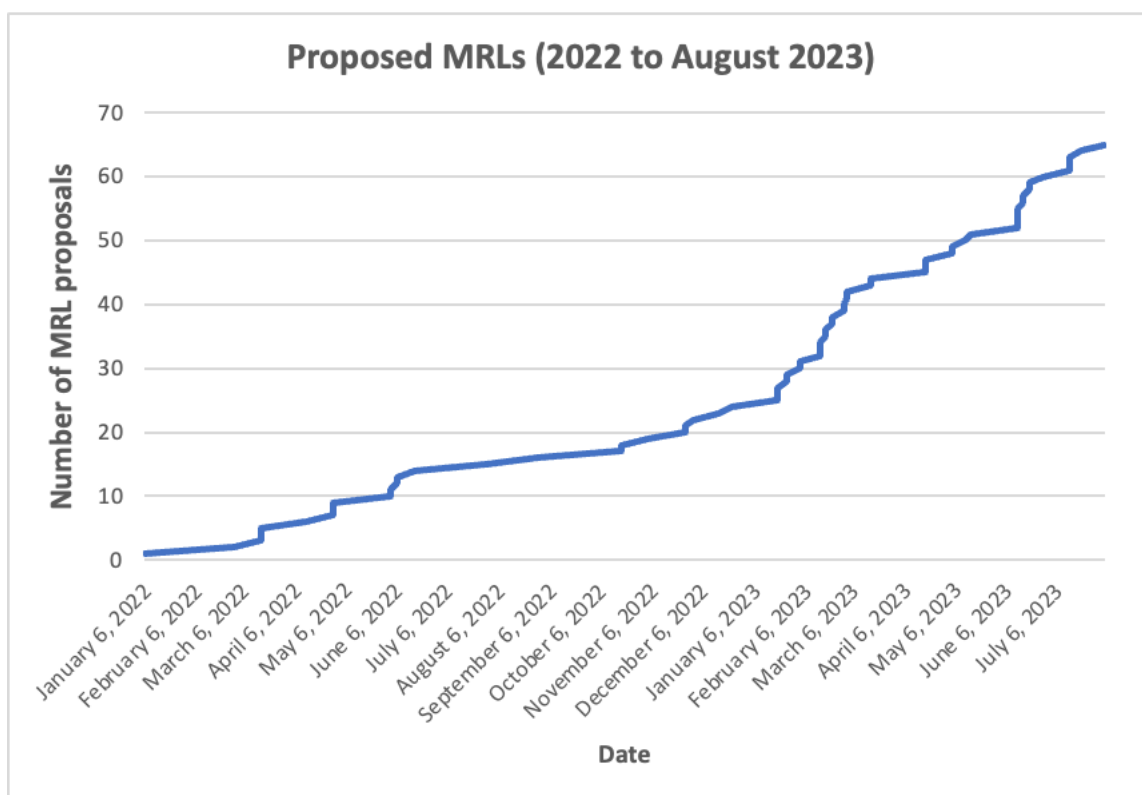
generation, occurring if/when several groups of scientists report harms in multiple studies of human populations as well as laboratory animals. **This is not a precautionary approach.**

Improvements in pesticide assessment emerging from the PMRA “transformation” process largely remain aspirational, pending implementation of new systems.

### **Pesticides sales and use are increasing in Canada**

Overall, sales of agricultural herbicides in Canada increased by 234% between 1994 and 2020,<sup>3</sup> including those based on glyphosate. Within that timeframe, between 2007 and 2017 glyphosate sales alone increased by 51%.

Rapidly increasing numbers of pesticide active ingredients, products and maximum residue limits (MRLs) continue to be reported by the Pest Management Regulatory Agency (PMRA), as illustrated in Figure 1.



**Figure 1. PMRA Maximum Residue Limit (MRL) approvals, from January 2022 to July 2023**

While some pesticides have been used over generations before eventually being banned, some ingredients may have limited useful lifetimes because evolutionary pressures result in resistant species. Unfortunately, declining efficacy is countered with higher application rates, more complex mixtures, new hazardous chemicals, more novel gene-edited plants, and now iRNA.

Genetically modified organisms (GMOs) and genetic material pose risks to biodiversity, as well as farmers' right to save seed. All products of gene editing and genetic modification pose inherent risks to native gene pools, and should be labelled and tracked. Canada's move to voluntary tracking and reporting by industry leaves agricultural biological integrity, the environment, and farmers' livelihoods all at risk. The organic agricultural sector, which offers the highest standards to preserve and benefit from biodiversity, is particularly at risk because genetic contamination is prohibited in organic foods.

## Steps to reduce pesticide use and risks

Canada must be ambitious, with transparency and accountability. Meeting the challenge of pollution reduction requires clear metrics to establish baselines and to track pollution/risk reduction.

**Identification and rapid phasing out of the most toxic chemicals.** Discontinuing the most hazardous chemistries would be a recommended start.

### Research and support to transition to sustainable, organic agriculture.

Concerted efforts by vested interests to thwart any actions to reduce pesticides use (and sales and profits), are reflected in Government of Canada documents, asserting that less pesticide use could risk food security. In contrast, there is clear evidence that:

- Pesticides are harming [pollinators](#),<sup>10</sup> [birds](#)<sup>11</sup> and many other species; and
- [Pollinators are essential for food production, as well as being key species within ecosystems.](#)<sup>12</sup>

Canada's sustainable agriculture initiatives and associated Ministries promote the notion that chemical pesticides are essential for food production, *and are silent on organic agricultural practices*. This is misleading because, for example, pesticides are indiscriminate and can set up a situation where they must be used repeatedly, as the rapid rebounding of pests outpaces the reproductive capacity of pest predators. This results in what is colloquially described as pesticides "addiction," that in turn can impact food security as well as food quality. Industry makes it sound as if chemical pesticides are the only answer to pests, but the opposite is also the case, particularly over the longer term. See our [summary submission on sustainable agriculture](#).<sup>13</sup> [Data-driven organic agriculture can be resilient, productive and profitable at scale.](#)<sup>13</sup>

Canada has a patchwork of farmers, foresters, and landscapers who use a variety of approaches, from organic, regenerative growers who use zero toxic chemicals and Quebec foresters who use no herbicides, to many who regularly spray crop land, cut blocks, and landscapes. In order to make necessary shifts smoothly and successfully, urgent actions for the 2023 growing season are needed, to:

- engage and learn from regional experts who use alternative approaches;
- engage experts in research;
- provide extension support for farmers;
- introduce a more ambitious stream of activities under the Sustainable Agriculture Strategy, including information and financing, transition to lower-input farming.

## ***Quantifying pesticide risk, to measure at least 50% risk reduction***

The Convention on Biological Diversity (CBD) Target 7 commits Canada to halving risks posed by pesticides, by 2030. Many lower-risk and non-pesticide solutions exist for unwanted plants, insects and other animals, and microbes.

Pragmatic first steps could include:

- cancelling registrations of chemicals for which there are safer alternatives; and
- requiring least-toxic approaches for “cosmetic” pest control.

The Federal government has maintained many National Capital and other properties without toxic chemicals for several decades, and in 2023 extended this to more properties. Ontario, Quebec, Halifax and other jurisdictions strictly limit methods to address pests.

Measures to assess progress are essential; lack of rigour in reporting and assessing progress could hijack this Target, risking ultimate failure to sustain biodiversity.

Potency of pesticide products ranges widely, meaning that direct comparison of the quantities applied over time is at best meaningless, and at worst misleading.

### **Measuring what we want to manage – is water contamination sufficient?**

Several approaches to estimate risks for comparative analysis are in process. Canada is working on water monitoring, though to date this is in a pilot phase and there is no baseline to measure 50% reduction. Water monitoring is important, but is at best important supplementary evidence. Not only is surface water contamination subject to the vagaries of local events (e.g., possible spraying the day before versus the day after sampling) and weather (did a drought dry up where chemicals had accumulated, or did a storm wash them away?), there are practical limitations—**Canada is vast, and has little data**. After two years of a pilot study, there are indications of widespread detections, but no real baseline. Now [vested interests are filling the void](#),<sup>14</sup> anticipating that their [study will show that vegetated strips will solve pesticides problems](#).<sup>15</sup>

The federal GBF consultation document ([Toward a 2030 Biodiversity Strategy for Canada: Halting and reversing nature loss](#) Error! Bookmark not defined.) proposed only water contamination for a metric to track risks associated with pesticides. This is insufficient and meets no standard for accountability.

### **International research method to compare pesticide uses and risks**

One important approach has been described by the Organisation for Economic Co-operation and Development (OECD).<sup>16</sup> They recommend reporting “Application Area” to account for repeated applications of a given product, and to sum and compare applications of numerous pesticides that have widely different potencies. This metric is commonly used in research: [recently by Canadian researchers](#);<sup>17</sup> and in a study of [pesticide use on Ontario golf courses](#).<sup>18</sup>

In brief, in order to sum up and compare risks posed by pesticide uses over time rigorously, the quantities must be normalized according to potency by dividing the kilograms of product by the application rate (kilograms per hectare or kg/ha). [Labels](#) are archived on the Pest Management Regulatory Agency (Health Canada) website, but the lowest application rate in Canada, the US or the EU should be used. This calculation yields equivalent hectares (ha-eq), which is the area over which a pesticide would be applied, according to a risk-based application rate.

$$[\text{equivalent hectares}] = [\text{kilograms of pesticide active ingredient}] \div [\text{application rate (kg/ha)}]$$

To be meaningful and useful, analyses must be granular in terms of:

- geography (regional);
- type of pesticide (e.g. herbicides, insecticides, etc.);
- chemical classes (e.g. phenoxy herbicides, neonicotinoids, organophosphates, pyrethroids, etc.); and
- target pests.

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## **ELECTROMAGNETIC FIELDS (EMF) – a rapidly escalating, under-recognized, preventable environmental pollutant**

It is a credit to Canada that responses to the 2023 Biodiversity Survey elevated anthropogenic (man-made) EMFs to the Milestone consultation. This reflects the strengthening scientific evidence of environmental harms (see <https://wirelessenviroimpacts.science>), as well as increasing awareness of risks of EMFs to environmental as well as human health. We now have a rare opening to advance protection of all life forms from EMF pollution, from telecommunications and other infrastructure and devices that generate non-ionizing radiation.

Environment and Climate Change Canada (ECCC) is the federal lead on the topic of environmental effects. Following a Parliamentary hearing, an ECCC scientist prepared the report, [Canadian Environmental Protection Act \(1999\): Considerations of electromagnetic fields \(radiation\) and biota](#).<sup>19</sup>

Dr. Fernie highlighted:

*Similar to multiple environmental chemical pollutants, there is scientific evidence of EMFs having similar endocrine, physiological and reproductive effects on some wildlife, although not consistent effects among species or across studies.*

She concluded:

*Across Canada, increased urban development and an increased reliance on new technologies is likely increasing EMF exposure of wildlife through additional power lines, telecommunications networks, and new technologies (e.g., 4G, 5G). It is conceivable that the RF-EMFs from power lines, telecommunication networks and technologies, may become or already are an environmental stressor to exposed wildlife, in conjunction with other, widely recognized environmental stressors that can affect wildlife, e.g., habitat destruction, climate change, chemical pollutants, heavy metals, among others. The potential of increasing EMF exposure as a contributing or confounding factor to adverse changes in wildlife, in conjunction with recognized environmental stressors, should be considered.*



The field has advanced considerably since Dr. Fernie identified that attention to RF-EMFs was merited. In 2023 we were principal collaborators in the creation of a website presenting the research on this topic, with specific discussions of insects, birds, trees and other species, in accessible formats - <https://wirelessenviroimpacts.science>. It also summarizes how alternative technologies are not only safer, they are more resilient, faster, and have a smaller carbon footprint. The website also includes a [library of peer-reviewed studies](#).

The following page contains a figure illustrating the levels of RFR exposures that elicited biological effects in wildlife. In twenty-three studies, researchers found diverse effects in wildlife in natural environments, at exposure levels several orders of magnitude lower than levels Health Canada deems safe for humans. Species studied included birds, insects, mammals, plants, ticks and amphibians.

We recommend that radiofrequency (telecommunications) and powerline EMFs be included in Canada's Biodiversity Strategy. This pollution can and should be reversed, consistent with Target 7. **Indeed, EMFs is the only form of pollution with an "off" switch.** Ensuring that technologies are designed and deployed to meet the highest standards for efficiency, health and safety can benefit both human and environmental health, not to mention resilience.

## Conclusion

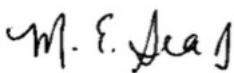
In summary, Prevent Cancer Now recognizes the urgency and scale needed for a successful Biodiversity Strategy. We thank the government for strong, urgent planning and recommend that the Strategy include:

- clear, ambitious actions to halve pesticides risks, while advancing research and transitioning to regenerative, organic farming practices, and supporting genetic diversity in agriculture;
- recognition and research regarding risks from modern electromagnetic radiation, and actions for safer, resilient technologies such as using fibre and wire connections;
- strong, urgent actions to preserve biologically functional natural landscapes, to address climate chaos with means that complement biodiversity goals and targets; and
- actions to prevent and address pollution and to preserve, restore and protect diversity of natural features, and species and their habitats.

Thank you for careful consideration of these comments and recommendations for Canada to do its utmost to protect and restore biodiversity, as well as counter climate chaos. For further information and to discuss, Prevent Cancer Now and associated experts ask you not to hesitate to reach out.

We look forward to rapid progress in your most important work for our future, and look forward to further engagement in this crucial topic.

Sincerely,

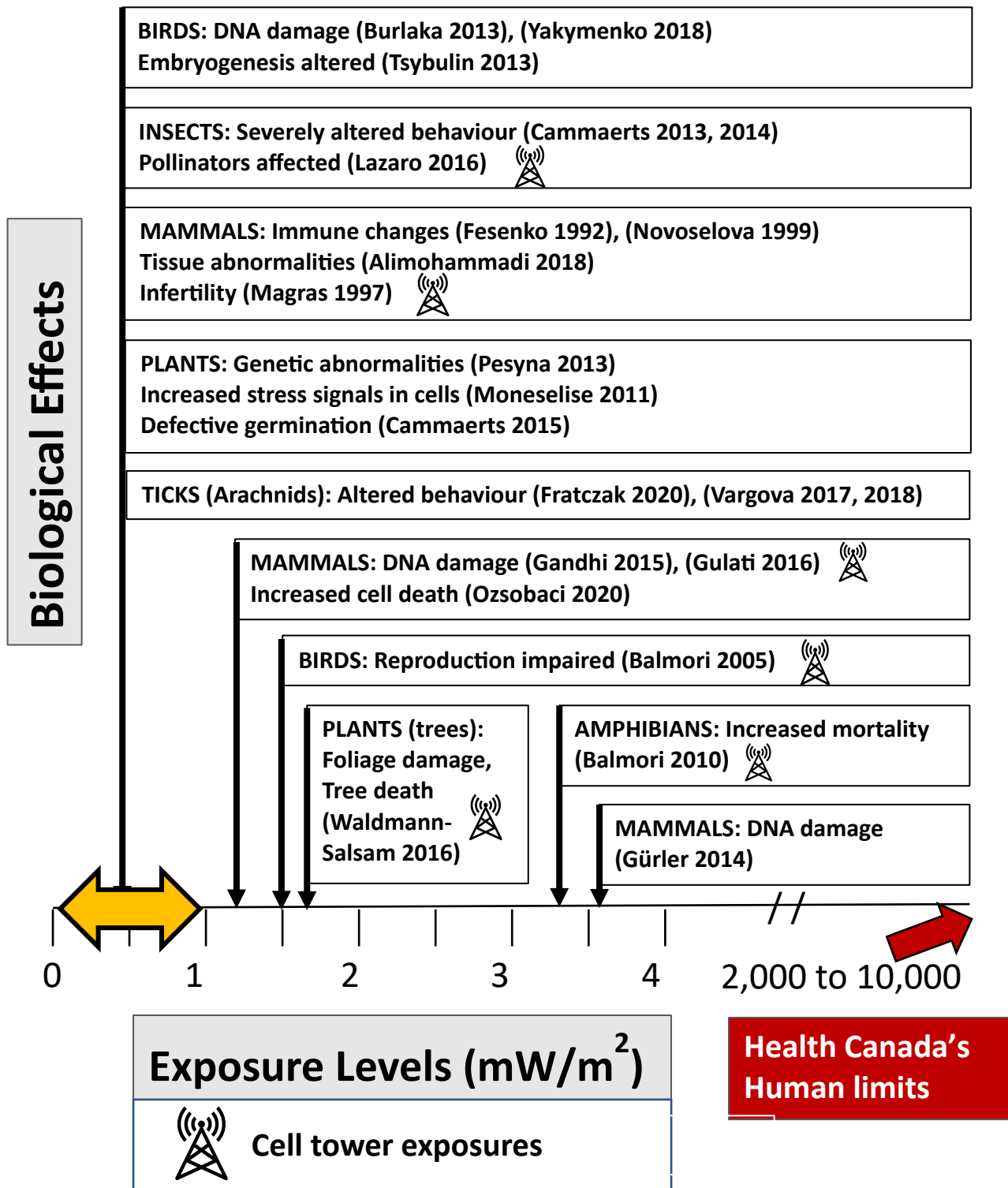


Meg Sears PhD  
[meg@preventcancer.ca](mailto:meg@preventcancer.ca)

613-297-6042

# Examples of biological effects on biota of wireless radiation (radiofrequency electromagnetic radiation) at common ambient exposure levels

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## Discussion of Targets, to Prevent Pollution from Pesticides and Non-ionizing Electromagnetic Fields (EMFs)

### Target 1: Spatial planning and effective management

#### Target 21: Knowledge sharing

Without ongoing, real-world data, we are flying blind. The pollutants we are focusing on – pesticides and EMFs – are applied or generated at specific locations, but pesticides drift and radiation is beamed over the surrounding landscape. Spatial distribution data for pollutants over time, including pesticides and EMFs, are important for biologists to study and identify needs for protection of biodiversity, while epidemiologists will be able to research contributors to diseases, including cancer.

Pesticides used for agriculture, forestry, landscaping, sports facilities, and indoor pest control are sporadic and non-uniform across the country. Data collection on use, and on water contamination, must be sufficiently fine-grained, sensitive and robust to capture risk reductions (or not) as pesticide uses change over time, hopefully with shifts to least-toxic strategies and alternative products. The pesticide industry shares the bare minimum of data with the regulator. For example, fine-grained sales data should be submitted as a matter of course, as it is done in other jurisdictions. Legal reform is beyond the scope of the present consultation, but it is necessary.

With data in hand, expertise can build more quickly in agricultural extension services to support alternative practices, and to operationalise use of lower-risk/biodiversity friendly practices and biopesticides.

*Pesticides are managed* by Health Canada's Pest Management Regulatory Agency (PMRA). The Agency has been undergoing "Transformation" so the biodiversity views are highly relevant. The portfolio of pesticides on the market should be re-examined and streamlined by cancelling registrations of many of the most hazardous products—old and new. As an example, numerous halogenated chemical pesticides registered during the past decade should be considered for revocation from the market, or at least much more thoroughly scrutinized for potential de-registration because modern endpoints (e.g, endocrine disruption), effects on biodiversity and environmental fate may not have been rigorously studied or reported to the Agency. Regulatory capture, for example regarding glyphosate, has been widely reported.

*Electromagnetic Fields (EMFs)* are emitted by devices and infrastructure that is permitted and tracked by Innovation, Science and Economic Development. Maps of cellular network antennas' details are publicly available, to track and model emissions and exposures across Canada – from cities to wilderness areas. Satellites and connecting infrastructure are also characterized. Electricity regulators have business details of transmissions and routes. Thus data on non-ionizing EMF exposures should exist, to follow change of EMF pollution over time on a fine-grained level. Heat maps are commonly used for this sort of effort. Exposure data is key to any scientific study.

*Spectrum management* is a commercial enterprise, as the Government of Canada auctions and sells spectrum. Some of these profits should be applied to real-world surveillance of the spectrum, to verify and validate modelling. Telecommunications companies need to realise, and the message should be clear, that zero-emitting options are much preferred, to the largest extent possible.

The Office of the Chief Scientist could possibly be of assistance in establishing necessary data standards, access, tools and transparency, including for non-experts.

**Target 2: Ecosystem restoration**

**Target 3: Protected and conserved areas (30x30)**

Both pesticide and EMF pollutants degrade ecosystems, and their ongoing adverse effects must be minimized in order to restore ecosystems. We know of no law presently aligned with this purpose. The *Pest Control Products Act* (PCPA) is administered to maximize choice and availability of pesticides, rather than to narrow down availability to the safest options. There is no law that minimizes EMFs; rather, the Government of Canada benefits handsomely from spectrum sales.

Pesticides and/or wireless devices have been proposed or used within efforts to restore and to protect ecosystems. In advance of deployment decisions, such operational elements should be carefully weighed, and options selected that minimize chemical and EMF pollutants, to avoid other ecosystem degradation

**Target 6: Invasive alien species**

Alien species will become more common with climate change, as ecozones shift. Careful eyes on the landscape - typically citizen scientists' - are important for early interventions. Solutions must be evidence-based. For example, pesticides may be a short-term "fix," but can ultimately result in perverse consequences benefitting the alien species (such as removal of predators or predators' food source during critical intervals, or opening up bare soil for more unwanted plants).

**Target 7: Pollution prevention**

Target 7 is open-ended regarding identification of pollutants. Pesticides are explicitly included, and EMFs should be added in the Strategy. Considerable science pertains to non-ionizing EMFs and this has been identified by an ECCC scientist as a concern. For more information, please see above, and the more extensive website: <https://wirelessenviroimpacts.science>, including an online [Zotero database](#) of scientific references with abstracts, pertaining to environmental effects of EMFs.

**Target 9: Sustainable use and management of wild species**

**Target 10: Sustainable management in key productive sectors**

**Target 11: Ecosystem services and functions**

Non-ionizing EMFs used in telecommunications can affect navigation of migratory birds (Target 9; <https://wirelessenviroimpacts.science/birds/>) and insects (Target 10 - bees are one subject of research <https://wirelessenviroimpacts.science/bees-and-other-insects/>).

**Target 12: Urban green and blue spaces**

Non-ionizing EMFs used in telecommunications damage foliage, leading to decline and death of trees. See: <https://wirelessenviroimpacts.science/trees/>

## **Target 13 / 15(c): Access and benefit-sharing from the utilization of genetic resources**

### **Target 15(a): Business' role**

### **Target 17: Biosafety/biotechnology**

It is essential to maintain and sustain genetically diverse species, especially foods. This is unfortunately not a primary short-term interest of commercial enterprises. There is a role for the government and/or academic or arm's-length institutions in maintaining farmers' access to *their own, home-grown seeds*. Continuous improvement is needed as the climate evolves.

For example, Mexico recognizes that genetically modified commercial seeds can pollute local strains and wild populations, and even introduce weaknesses. De-regulation of gene-edited seeds and pesticides is not compatible with maintaining biodiversity. Indeed, genetic pollution takes away a fundamental human right to feed one's family and to farm using the best seed from the previous year. All farmers, and particularly organic farmers, are put at substantial business risks beyond their control. This is wrong.

Achieving these objectives cannot be done without recognizing and addressing problems of scientific and regulatory capture by the agrochemical industry of the Canadian agencies responsible for the evaluation and regulatory framework of pesticides. Independent views are unfortunately common, that the Pest Management Regulatory Agency (PMRA) "will favor commercial interests over the imperatives of public health and environmental protection."<sup>20</sup>

No tax payer or government can afford the costs of the looming disasters. Large sums spent on false solutions is not only wasted, it raises false hope and can discredit the federal government in the eyes of experts. Importantly, it leaves less money available for the basic solutions needed, such as organic regenerative farming, and resilient non-emitting fibre telecommunications.

We have identified substantial gaps in assessment and management of adverse exposures on biodiversity; particularly when data is lacking. These may be considered in formulation of a new Act for biodiversity.

### **Target 14: Mainstreaming of biodiversity values**

This is an important challenge for the related crises of climate and biodiversity. A first step is awareness that this is happening "in my backyard" as well as nationally and globally. Make the connections between pollutants and precarious situations with expert voices. Finally, to overcome helplessness with social responsibility/connection for joint action for common goals—how do we collectively sideline mis/disinformation and fulminating dissent?

Clear, trusted, non-inflammatory voices are important to bring attention to today's events. By way of example, at time of writing we fear an impending lack of maple syrup in the Ottawa valley. Maples started budding—a sign of the end of sap for the season—about 6 weeks early, before trees are even tapped.

**Target 15(b)/16: Sustainable consumption**

Cancer prevention includes many aspects of sustainable consumption (or more accurately non-consumption). Some examples are growing and consuming organic food, regular exercise such as active transportation, avoidance of many chemicals in daily life by using simple cleaners, personal care products, etc. There are many reasons for individuals' choices, and although messaging is increasingly difficult in today's hyper-connected, "noisy" information space, many recommendations are well known but not acted upon because of: 1. the perception of the insignificance of the individual; and/or 2. misinformation.

**Target 20: Capacity building – Other resources for implementation**

Regarding pesticides, the organic agricultural sector has established success, experience, and a depth of knowledge as to how to achieve success without use of toxic chemicals. From coast to coast to coast, the Canadian Organic Growers and associated groups and individuals can provide solutions locally. The Organic Federation of Canada, researchers at the Organic Agriculture Centre of Canada, and innumerable associated groups nationally, provincially, and locally should be supported for assistance in a rapid transition of agriculture. Others can contribute knowledge to establish best practices instead of toxic pesticides for landscaping, as in Ontario.



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