WHY
Birds, Bees, & Trees
Need Protection in Law from Wireless Radiation
&
HOW
We Can Make This Happen

Margaret (Marg) Friesen

- Bachelor Science (Honours-Zoology)
- Masters Science (Entomology/Toxicology)
- Over 30 years experience with the federal government and University of Manitoba in original research: cancer research, ecosystem toxicology, DNA population genetics of Arctic marine mammals
- Post retirement, environmental health and wireless radiation, electromagnetic radiation (EMR)

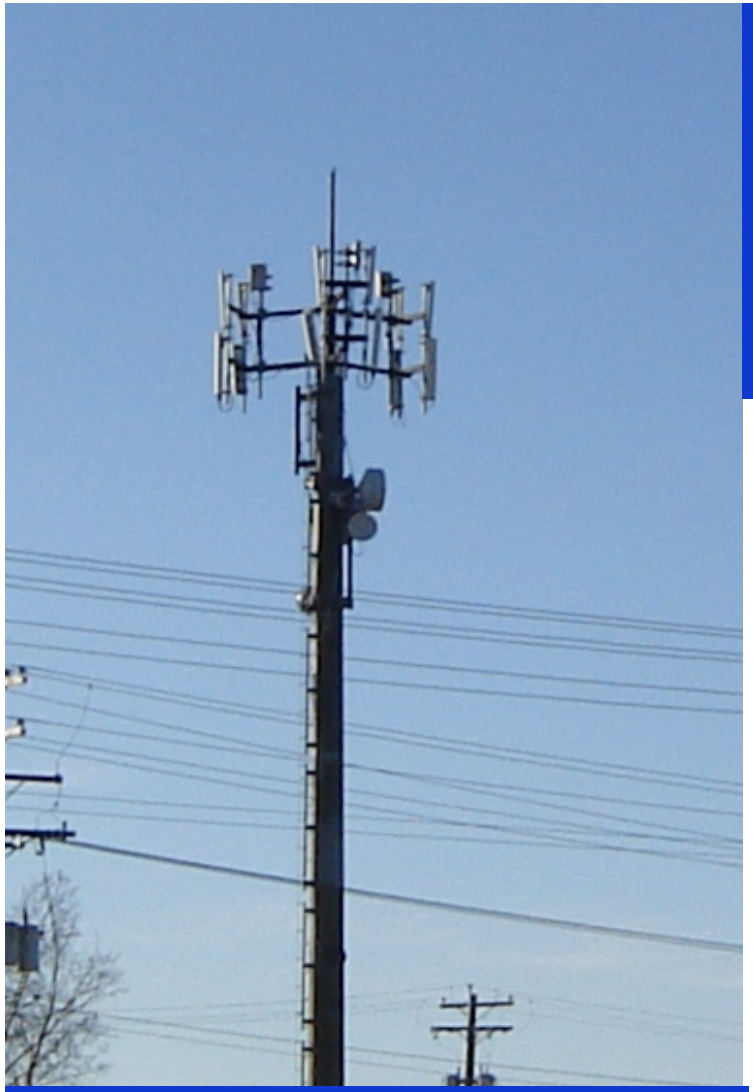
WHY
A protective law for plants and animals is needed

Canadian Environmental Protection Act, 1999 (CEPA)

In March 2000 when *CEPA, 1999* came into force, there were very few cell towers and few other sources of wireless radiation in the environment.

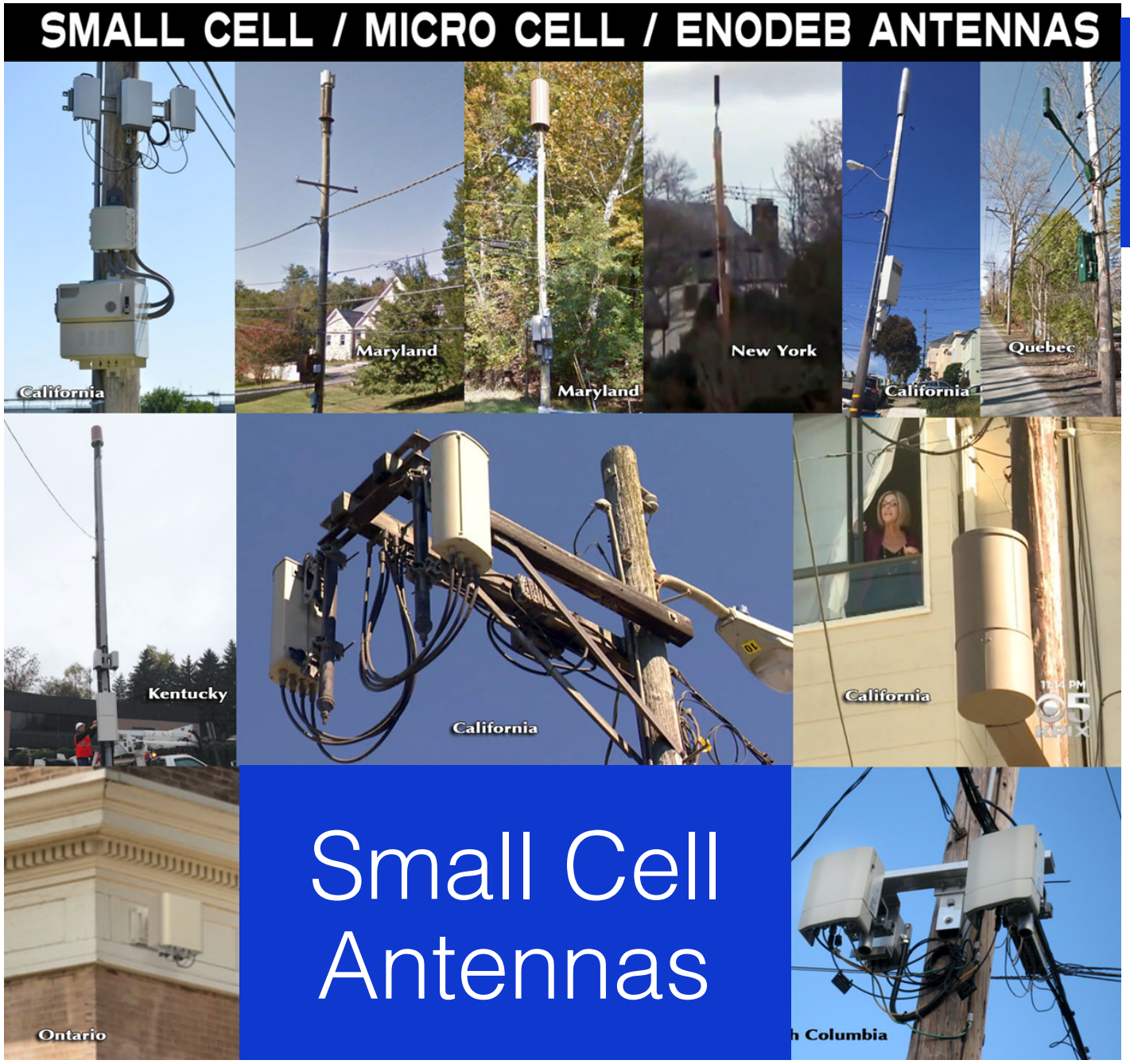
There is no mention in CEPA of wireless radiation, also known as radiofrequency electromagnetic radiation (RF-EMR)

Sources of Wireless Radiation in the Environment



Macro Cell Tower

- **In Canada today:**
- **approximately 50,000 cell towers**
- **more than 850,000 cell network antennas**



Sources of Wireless Radiation

As new technologies are rolled out …

Tens of thousands more cell antennas across

Small Antenna Installations

- 4G/5G antennas also now being installed on lamp posts and poles, paving the way for 5G antennas
- Every half city block

In Winnipeg, at least 3,700 and perhaps more than 7,000

Small Cell Installations Close to Homes

Mission, BC:

5 homes and at least 3 cell installations

Smart meters

Millions across Canada.

BC alone is planning on 1.1 million gas utility meters in addition to the many they have now.

Quebec has the stated goal of one on every home, school, business, etc.

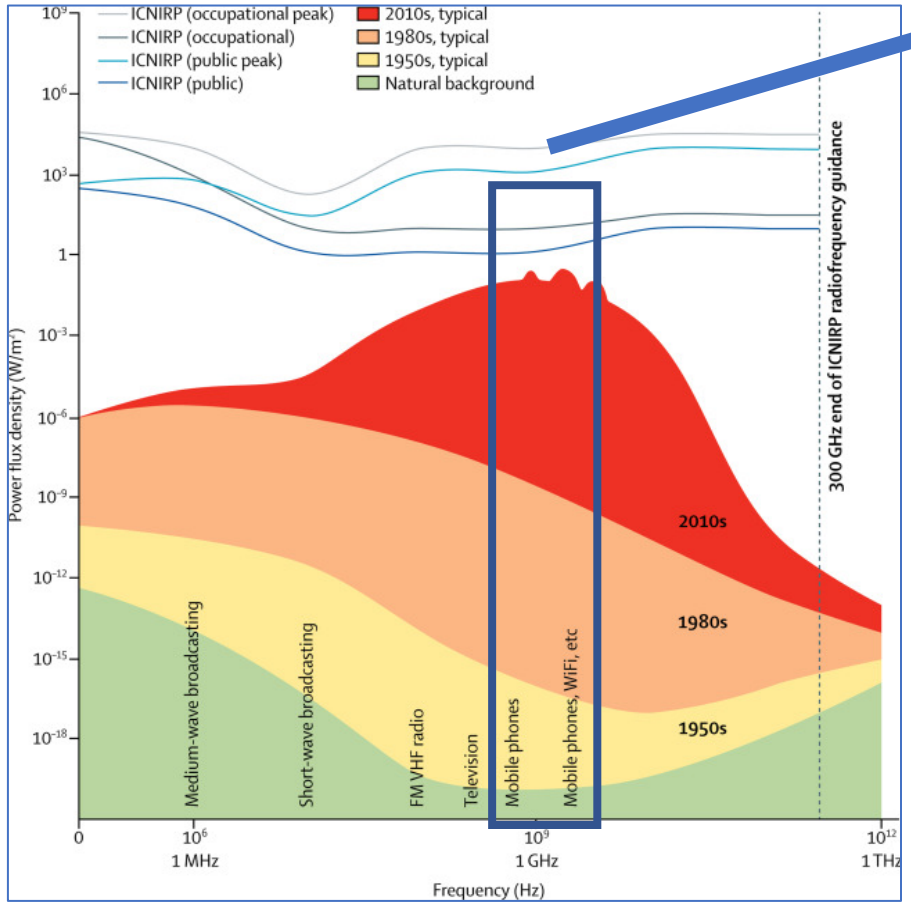
Low Orbit Satellites

Already more than 2,000 in orbit.

10s of thousands more planned.

Wireless radiation levels
rillions of times above natural levels

Planetary Electromagnetic Pollution:
It is Time to Assess Its Impact.
Adapted from: The Lancet Planetary Health 2 (12):e512-14.

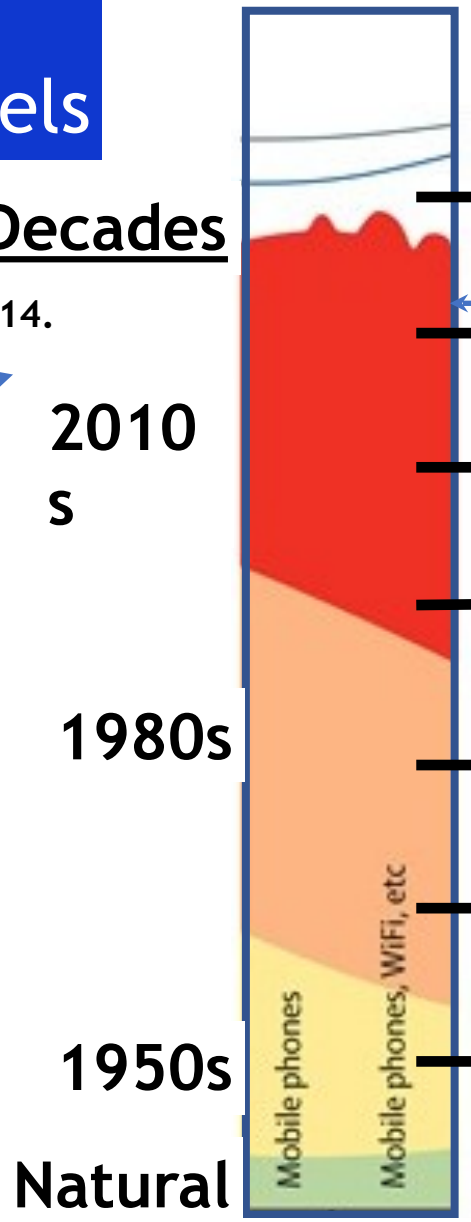


Log scale

Frequencies

Decades

Power Density mW/m²



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Cell Antenna
Peak Emissions:
10 mW/m² is common
and often much higher

Common wireless
radiation frequencies

Adding more EMR-emitting cell antennas will lead to substantially more wireless radiation in the environment.

There are no Canadian guidelines or laws protecting non-human organisms

Health Canada's Safety Code 6 Guidelines are for People

There are guidelines that set limits for human exposures:

- Based on the assumption that only heating can harm
- Based on 6-minute duration exposures for telecommunications frequencies

The Science
Demonstrating Harm to Plants, Animals and Other Non-Human Organisms

First: A Frequent Question

RF-EMR is part of the non-ionizing part of the electromagnetic spectrum.

Can non-ionizing EMR cause harm even if it does not have as strong energy as ionizing radiation (such as X-rays)?

YES.
Non-ionizing EMR Can Cause Adverse Biological Effects at Extremely Low Levels

Physics (PhD), electrical engineering (15 years), and health sciences (30 years).

https://ehtrust.org/science/published-research-by-paul-heroux-phd-on-electromagnetic-radiation/

Conference for MDs and others

CME Continuing Medical Education (CME) Credits

EMF MEDICAL CONFERENCE 2021

Dr. Paul Héroux

Faculty of Medicine, McGill University

https://emfconference2021.com/speaker/paul-heroux-phd/

Overview:
Studies on EMR Biological Effects (919)

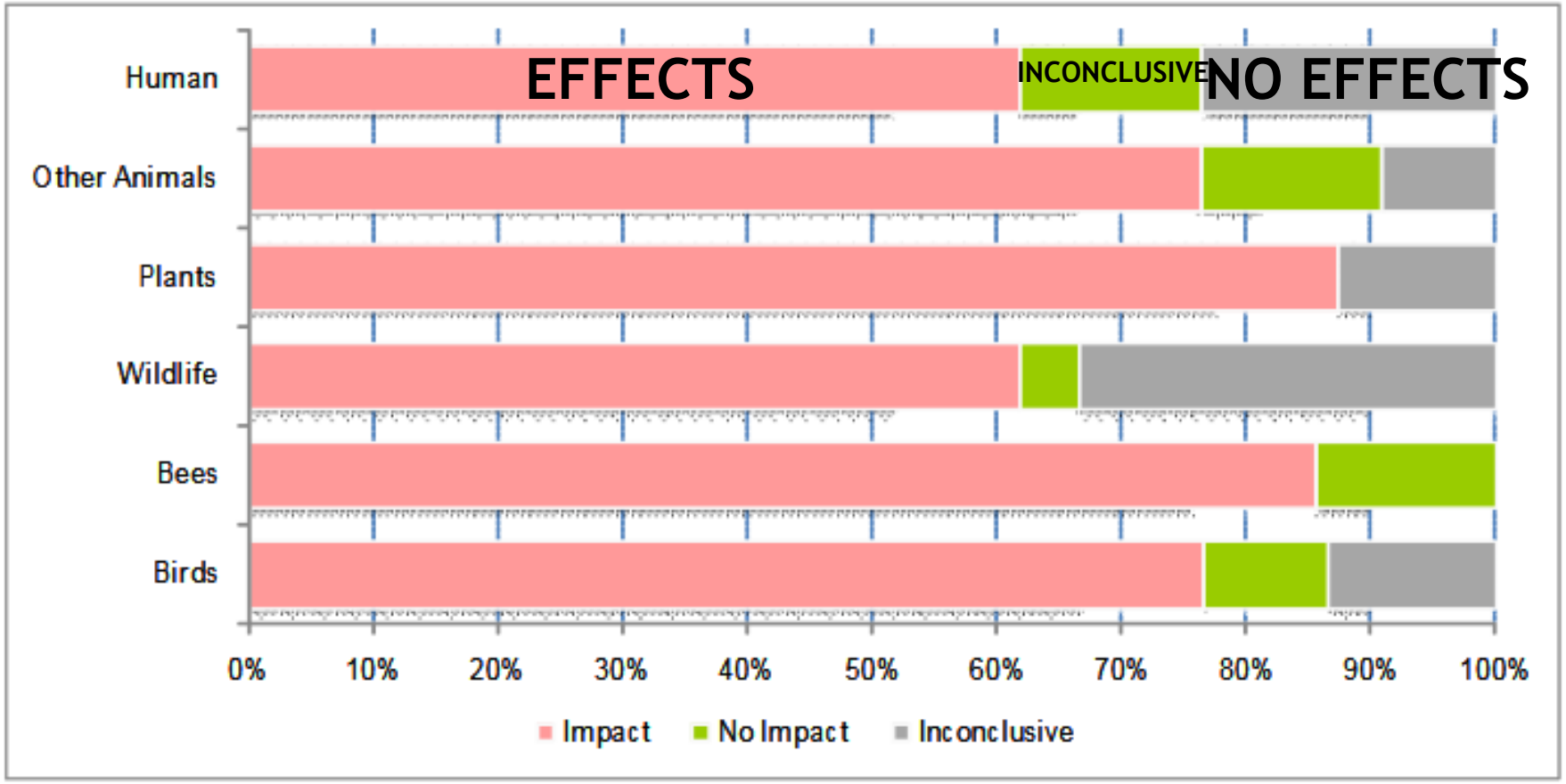


Fig 2. Proportion of study results in various groups of organisms (n=919). The 'Impact' (in red) indicates percentage of studies that reported harmful effect of EMR Expert Committee. India. 2011

Ecological Field Study
Cell Towers and Pollinators

Electromagnetic radiation of mobile telecommunication antennas affects the abundance and composition of wild pollinators

A. Lázaro ✉, A. Chroni, T. Tscheulin, J. Devalez, C. Matsoukas & T. Petanidou

Journal of Insect Conservation **20**, 315–324 (2016) | Cite this article

"… these changes …associated with electromagnetic smog may have important ecological and economic impacts on the pollination service that could significantly affect the maintenance of wild plant diversity, crop production and human welfare."

ELSEVIER

Biological Conservation

Volume 232, April 2019, Pages 8-27

Review

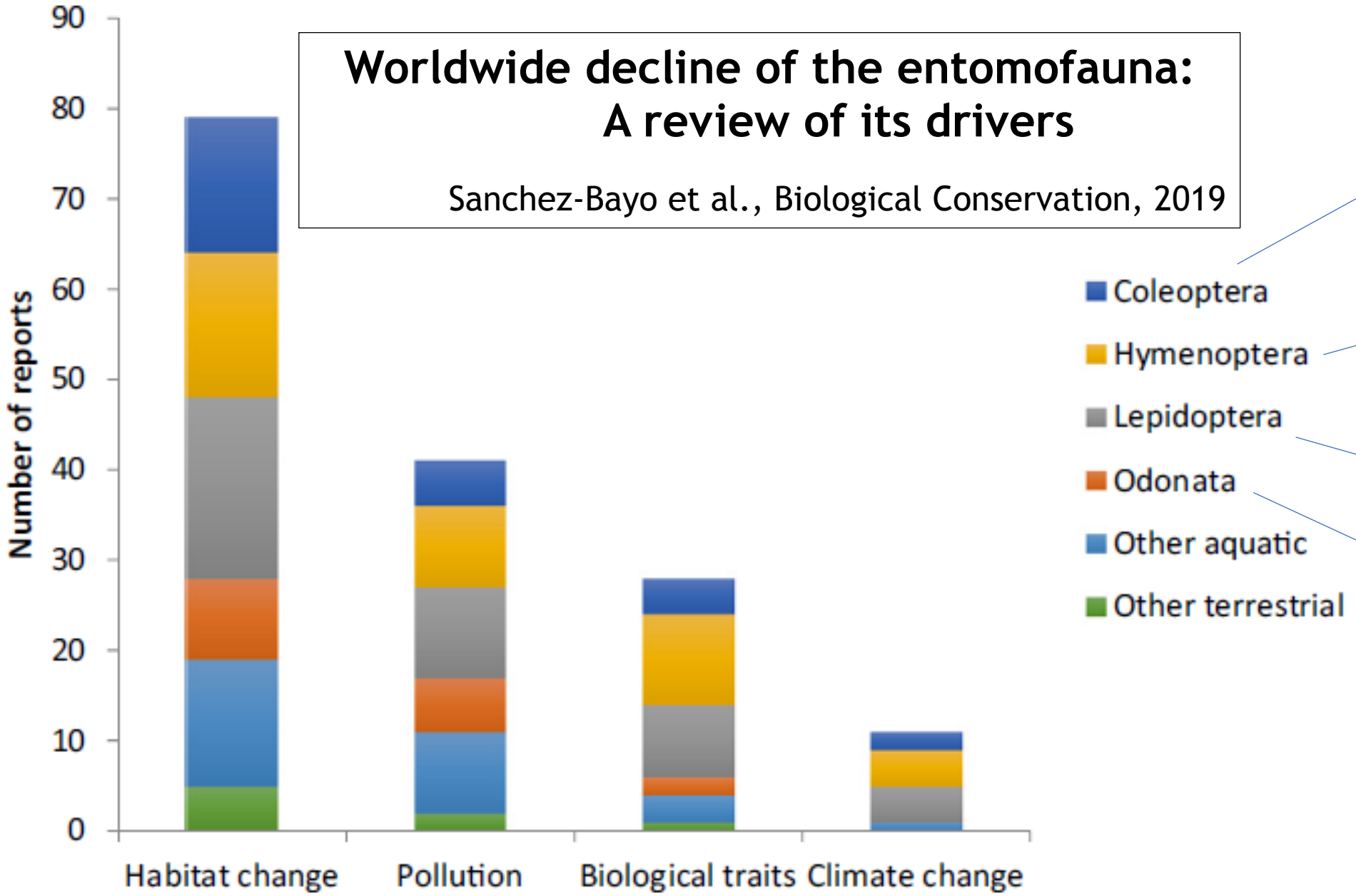
Worldwide decline of the entomofauna: A review of its drivers

Francisco Sánchez-Bayo [a], Kris A.G. Wyckhuys [b, c, d]

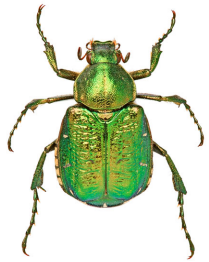
- Over 40% of insect species are threatened with extinction.
- Lepidoptera, Hymenoptera and dung beetles (Coleoptera) are the taxa most affected.
- Four aquatic taxa are imperiled and have already lost a large proportion of species.

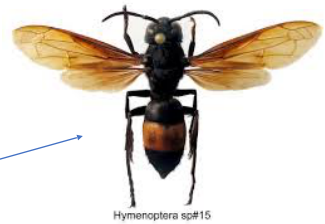
Worldwide decline of the entomofauna: A review of its drivers

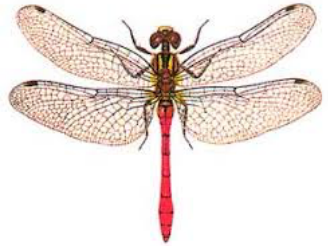
Sanchez-Bayo et al., Biological Conservation, 2019



Adult Forms







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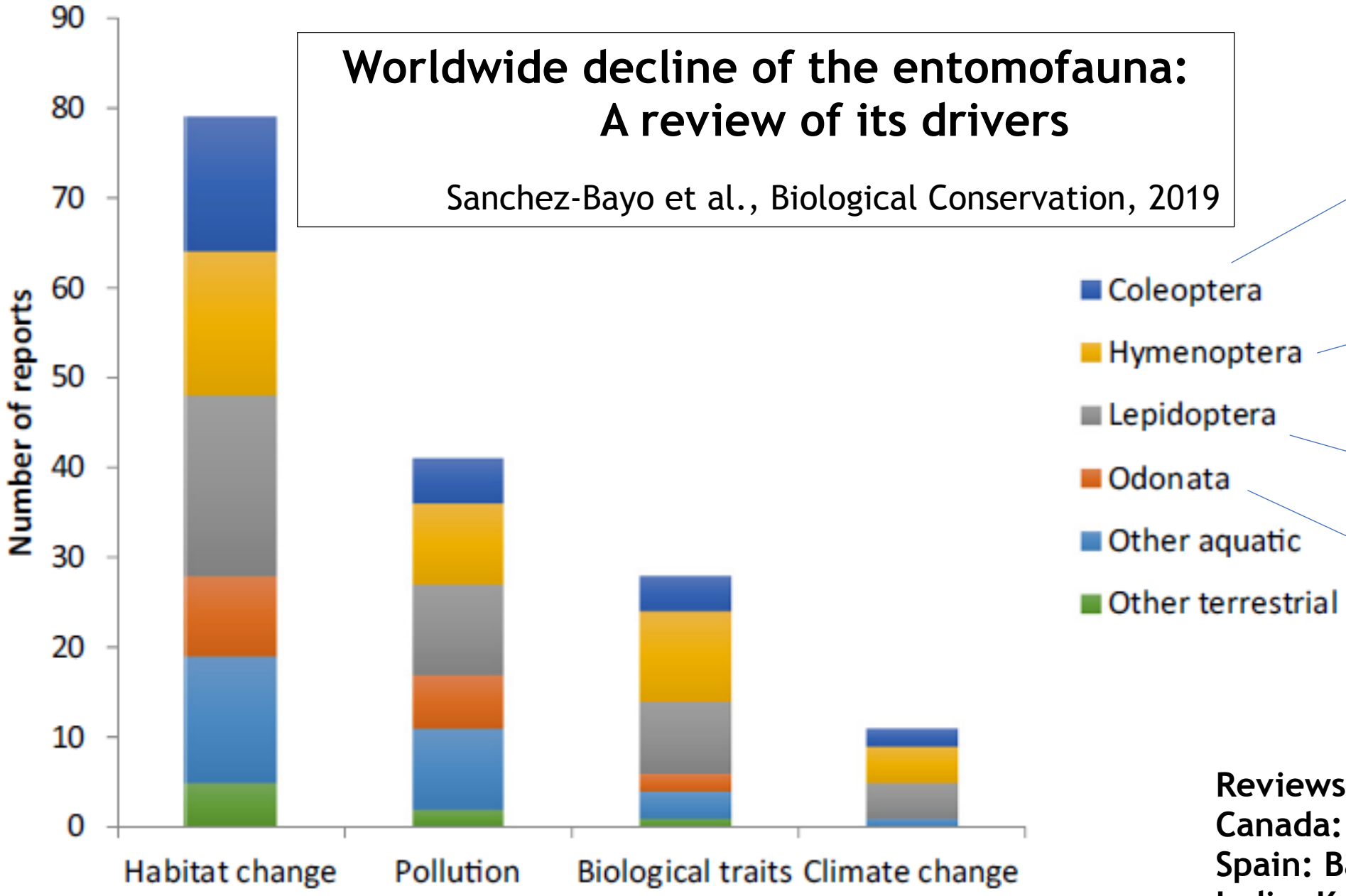

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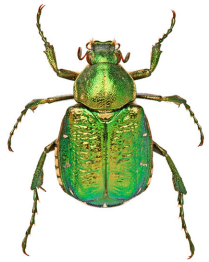

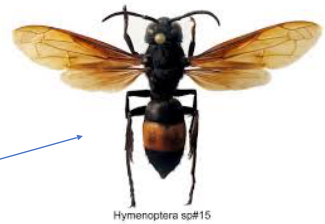

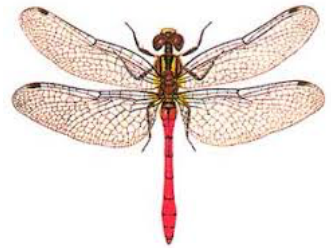

Reviews:
Canada: Friesen & Havas
Spain: Balmori
India: Kumar

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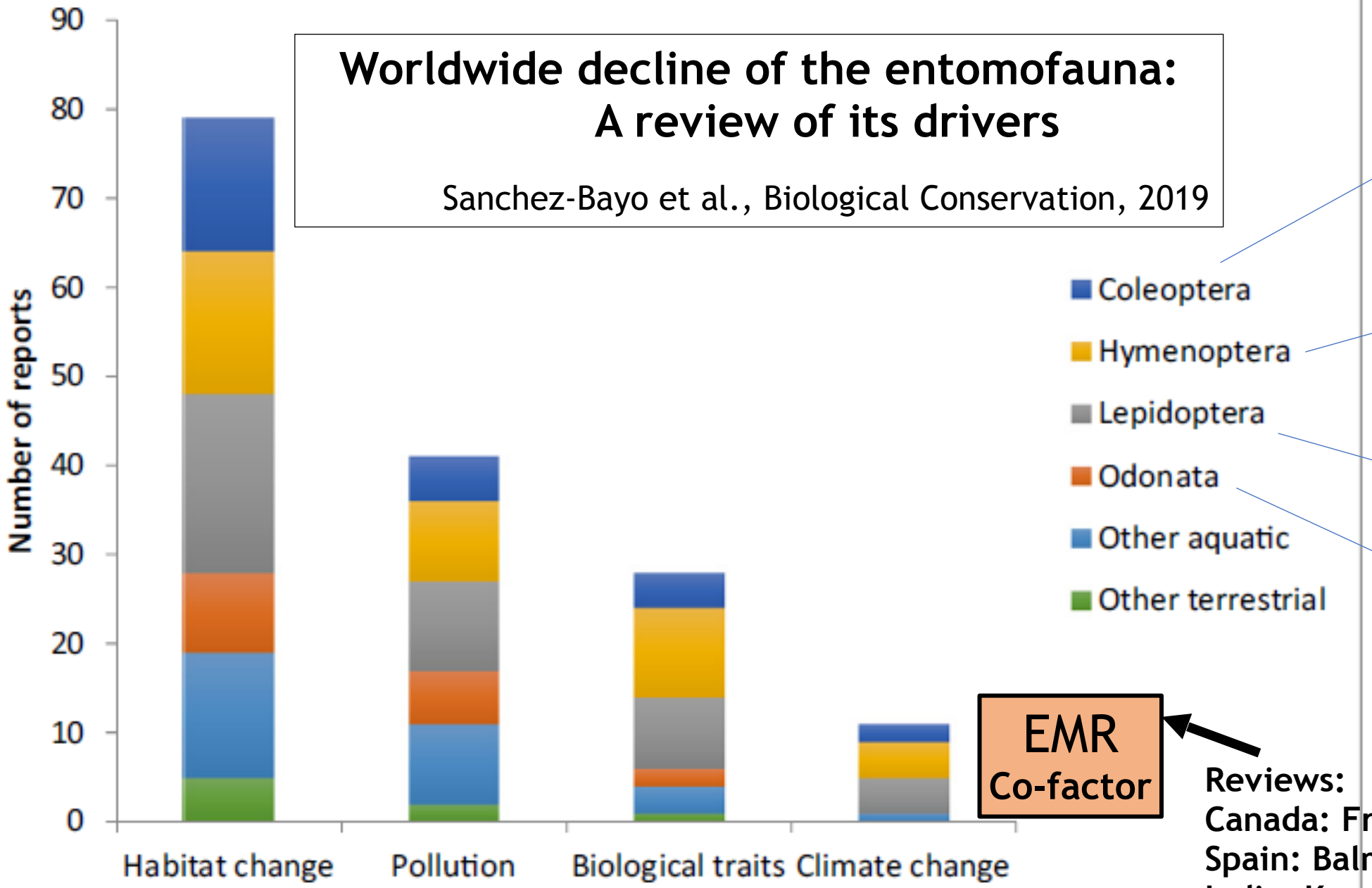
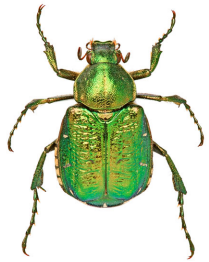
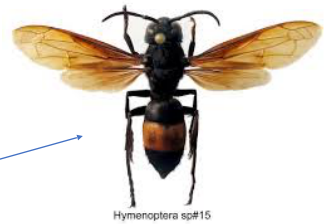
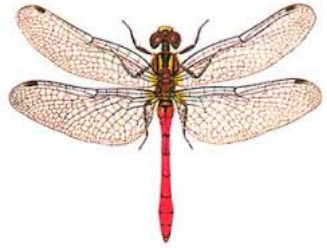


EMR
Co-factor

Adult Forms







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Many Bird Species are Affected

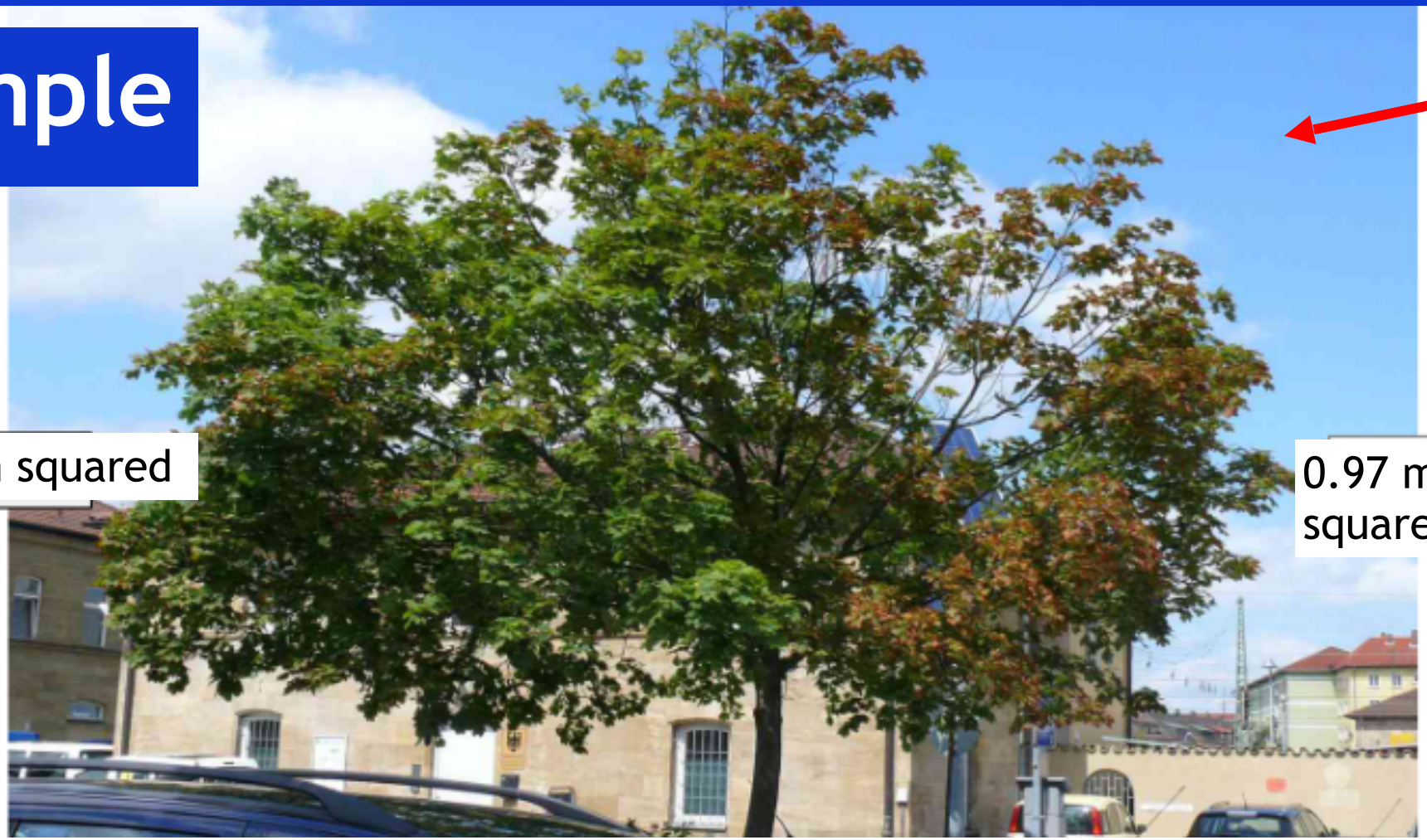
Example

European robin

- Ambient EMR affected behaviour
- “The weak broadband field very efficiently disrupted their magnetic compass”

Trees and Other Plants can be Harmed

Example



0.13 mW/m squared

0.97 mW/m squared

Tree damages in the vicinity of mobile phone base stations.
Waldmann-Selsam and Eger. umwelt-medizin-gesellschaft, 26: 198-208.

Effects of Non-Ionizing Electromagnetic Fields on Flora and Fauna (3-Part Review) Close to 1,000 References

Blake Levitt
Medical Journalist

Dr. Henry Lai, Professor Emeritus
University of Washington, Bioengineering

Albert Mansville, Bird Specialist, formerly US Fish & Wildlife Servi.

Effects of Non-Ionizing Electromagnetic Fields on Flora and Fauna,
Part 1. Rising Ambient EMF Levels in the Environment.
Part 2 Impacts: How Species Interact with Natural and Man-Made EMF.
Part 3. Exposure Standards, Public Policy, Laws, and Future Directions.
Reviews on Environmental Health. 2021

https://doi.org/10.1515/reveh-2021-0026. https://doi.org/10.1515/reveh-2021-0050. https://doi.org/10.1515/

Quote 1 from Levitt et al.

Where healthy, breeding bird populations had persisted, once cell towers were installed and operating

- nest and site abandonment, plumage deterioration, locomotion problems, reduced survivorship, and death:
- House Sparrows, White Storks, Rock Doves,

Magpies, Collared Doves, and other species.

This was documentation in the field of some very troubling consequences of the impacts of cell tower radiation on wildlife

Quote 2 from the Levitt et al.

Biological effects have been seen broadly across all taxa and frequencies at vanishingly low intensities comparable to today's ambient exposures. Broad wildlife effects have been seen on orientation and migration, food finding, reproduction, mating, nest and den building, territorial maintenance and defense, and longevity and survivorship. Cyto- and geno-toxic effects have been observed.

HOW
Can Wildlife, Plants, Animals and Other Non-human Organisms be Protected?

By Including EMR in a Law

GIVEN THAT
EMR at ambient levels is biologically active and can harm diverse life forms

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EMR at ambient levels is biologically active and can harm diverse life forms
AND
There is no legislation, policy or guideline in Canada protecting plants and animals from exposure to EMR

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GIVEN THAT
EMR at ambient levels is biologically active and can harm diverse life forms
AND
There is no legislation, policy or guideline in Canada protecting plants and animals from exposure to EMR
IT IS TIME
For a Law to provide that protection!

The Environmental Protection Act Is the Logical Law

Canadian Environmental Protection Act (CEPA) is Being Amended Now

SENATE OF CANADA

Bill S-5 to amend CEPA is before the Senate's Energy, Environment and Natural Resource Committee (ENEV)

To Educate and Inspire Canadians to Take Action

PREVENT CANCER NOW

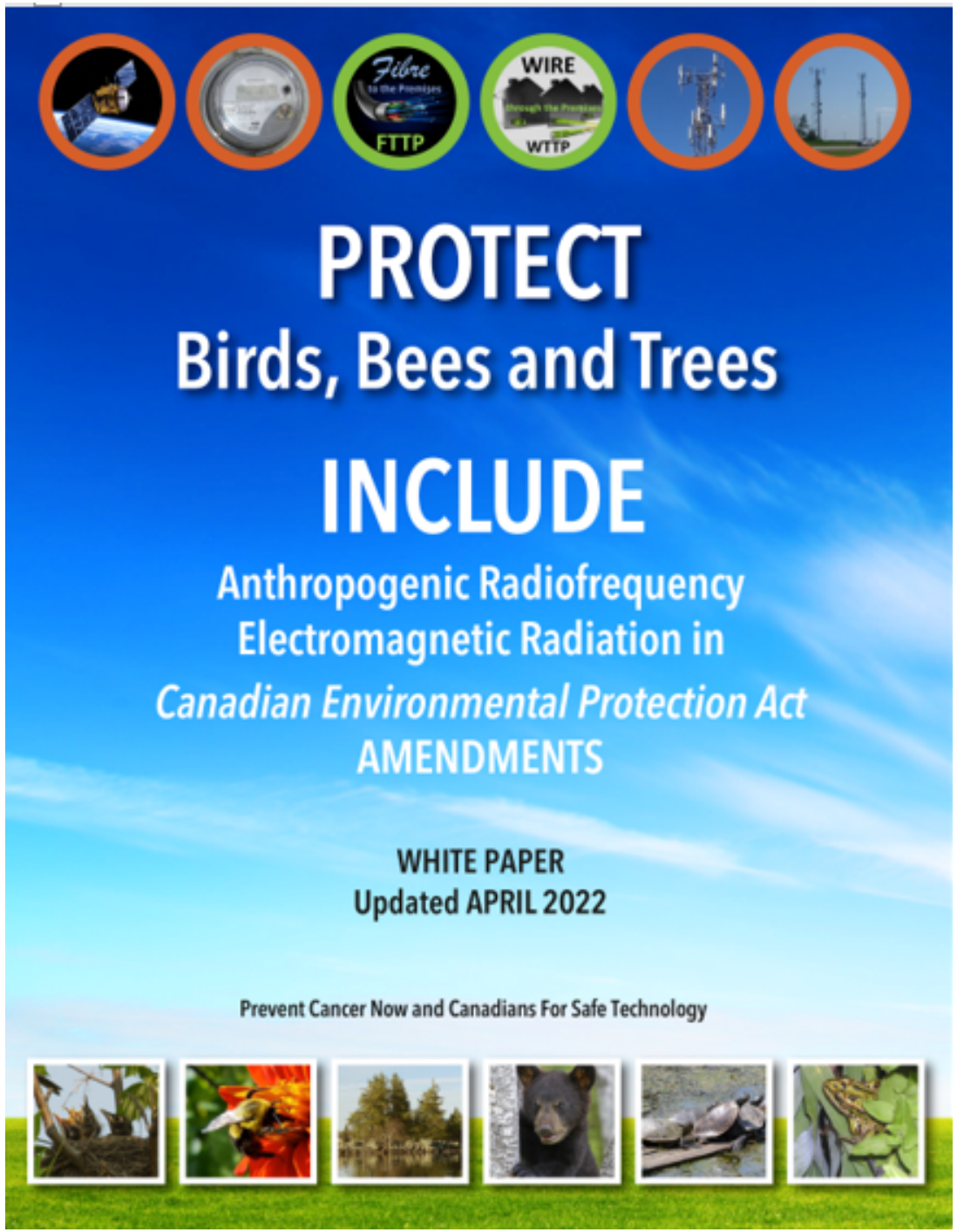
Prevent Cancer Now

&

Canadians for Safe Technology

C4ST
CANADIANS FOR SAFE TECHNOLOGY
CANADIENS POUR UNE TECHNOLOGIE SÉCURITAIRE

Have Co-authored a White Paper



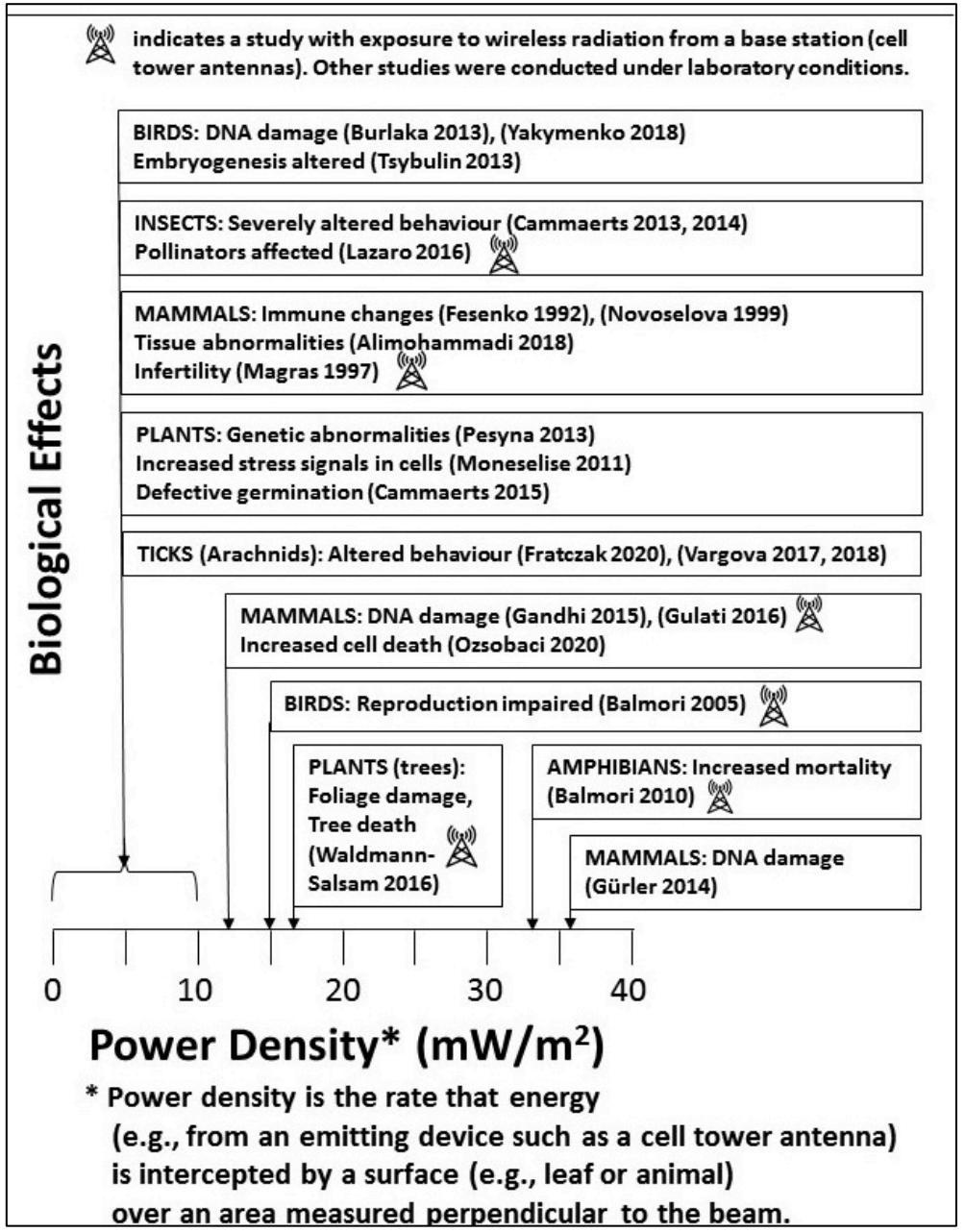
PREVENT CANCER NOW

C4ST
CANADIANS FOR SAFE TECHNOLOGY
CANADIENS POUR UNE TECHNOLOGIE SÉCURITAIRE

Harmful biological effects demonstrated at ambient wireless radiation levels.

Figure 2 from the PCN/C4ST white paper.

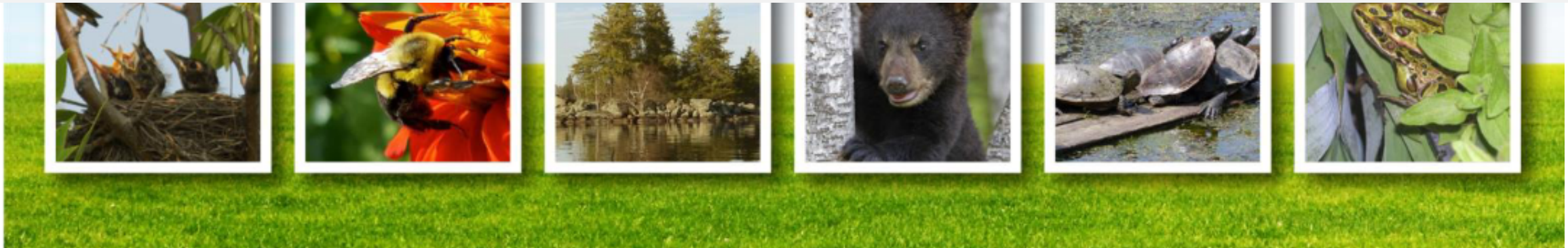
Examples of biological effects on biota exposed to anthropogenic radiofrequency electromagnetic radiation (RF-EMR) "wireless radiation" levels,
50 to more than 2,000 times below Safety Code 6 limits (2,000 - 10,000 mW/m² depending upon the frequency).
(Data from Supplemental Materials Part 2, Levitt et al. 2021,[2] and primary literature, listed in the Appendix.)



PROTECT
Birds, Bees and Trees

7 Section 44 of the Act is amended by adding the following after subsection (4): Radiofrequency ele

(5) The Ministers shall conduct research or studies relating to radiofrequency electromagnetic radiation, methods related to its detection, methods to determine its actual or likely short-term or long-term effect on the environment and human health, and preventive, control and abatement measures to deal with it, and alternatives to its use, to protect the environment and human health.



One last thought:
Our Choices Can Reduce EMR
Wired is Superior to Wireless

Dr. Paul Heroux:

- **“Fortunately, there is a spectacular alternative to wireless: optical fiber”.**
- **Prosperity is better served by “a fiber in every home”, because future data needs, not only of industry but for individuals, will soon outpace all that wireless has to offer.”**

Call to Action !

1. Send Senators a copy of the Protect Birds, Bees… white paper. Follow up.
2. Ask Senators to invite EMR experts who have studied birds, bees and other aspects of the environment to appear as witnesses before ENEV
3. Ask Senators to make a motion or otherwise work to get the amendment proposed and passed.

We Thank You

Photo credits are in “Protect Birds, Bees and Trees… Include EMR in CEPA” PCN/C4ST White Paper

PREVENT CANCER NOW

C4ST
CANADIANS FOR SAFE TECHNOLOGY
CANADIENS POUR UNE TECHNOLOGIE SÉCURITAIRE

Canadian Environmental Protection Act (CEPA) Amedments will go to the House of Commons

MPS- House of Commons ???

THE END

Proposed amendments to Bill S-5, on radiofrequency electromagnetic radiation

6.1 Section 43 of the Act is amended by adding the following after the last definition in the section:

"radiofrequency electromagnetic radiation" means:

> radiated energy arising from accelerating electrical charges, having the form of electromagnetic waves and a stream of photons, and travelling at the speed of light in a vacuum. The rate of oscillation of the waves is in the range between 3 kilohertz (kHz) to 300 gigahertz (GHz), which corresponds to the frequency of the non-sinusoidal radio waves typically used in radio communications.

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Radiofrequency electromagnetic radiation

(5) The Ministers shall conduct research or studies relating to radiofrequency electromagnetic radiation, methods related to its detection, methods to determine its actual or likely short-term or long-term effect on the environment and human health, and preventive, control and abatement measures to deal with it, and alternatives to its use, to protect the environment and human health.

Green & Safe Technology

WHY & HOW

Green Talks, Green Party of Canada VGM
March 25, 2022

PANELISTS

1. Margaret Friesen – Environmental Health Association of Manitoba
2. Shelley Wright – Canadian Educators for Safe Technology
3. April O'Donoughue – Citizens against the Proliferation of Cell Antennas in the Eastern Townships (Québec)
4. Frank Clegg – Canadians for Safe Technology

Top reasons to change the current direction of rollout of wireless technologies:

- Impacts on the Environment
- Impact to Human Health and Well-being*
- Infringement of Human Rights*
- Major Contributor to Climate Change and Pollution*
- Security Breaches and Risks to Personal and Business Privacy
- Satellite impact
- Impacts on Weather Forecasting Accuracy
- Increased Economic Burden

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