EKLIPSE Draft document of work-
Requests that will be going through processes of identification of research needs and/or societal debate

GENERAL INFORMATION

Requesters: BUGLIFE- Matt Shardlow
Date request received: *28/10/2016*
Date of first meeting with requesters andEKLIPSE KCB and methods experts: *31/01/2017*
Expected deadline for deliverables: 31/01/2018

Potential other requesters, stakeholders or parties interested in the outputs:
Kevin Gaston – University of Exeter

WHAT IS YOUR REQUEST?

Original request:

What are the impacts of artificial electromagnetic radiation on invertebrates? What is the risk that such radiation is causing harm to populations of invertebrates, other wildlife and ecosystem services? What are the evidence gaps that are the highest priority to address? What policy solutions should be considered?

Updated request based on further discussions between requesters and EKLIPSE:

Focus on wildlife more generally: vertebrates, invertebrates and plants

What are the impacts of artificial electromagnetic radiation on wildlife? What are the evidence gaps that are the highest priority to address? What policy solutions should be considered?

Impacts on Human health will not be included as this is a whole different scope.

Context and justification:

From the Requester:
"We are aware of several published papers looking at the effects of EMR on invertebrates - e.g. Lázaro, A., Chroni, A., Tscheulin, T. et al. J Insect Conserv (2016) 20: 315. doi:10.1007/s10841-016-9868-8 While we have often heard scientists pour scorn on the concept that EMR could damage ecosystems, what research we have seen suggests that the mechanism and drivers are there and that field effects are observable. We believe that this is a topic that deserves a fresh and unprejudiced scientific review. While it may be challenging to regulate EMR to avoid environmental effects, the sooner those effects are understood the sooner any necessary policy and regulatory measures are considered the better. This is about genuine horizon scanning and tackling a difficult issue for society with the best available science and scientific tools, before significant harm is caused. Should EMR present a credible risk to ecosystem health it would be possible to introduce measures that could mitigate harm, such as managing frequencies and reducing duplication of transmitter networks.

We use EMR in many different ways and those uses are expanding and growing in terms of the range of frequencies and the volume of transmissions. We are broadcasting in wavelengths to which we are blind and are not expecting this to cause harm. However, many other species are sensitive to EMR in ranges in which we broadcast. Ensuring that important ecosystem services such as pollination and pest control are not harmed by EMR and also that we are not causing biodiversity decline or reducing the amenity value of the countryside are very important objectives. With better understanding and awareness of any EMR environmental risks the policy solutions can be developed, promoted and implemented. This is an issue that is below the radar for most people at the moment; Buglife is a smallish charity and does not have the resources to commission work to address this issue. The beneficiaries are the public at large so individual companies or government agencies are unlikely to fund research in this area, we are dependent of generating interest and momentum within the scientific community and believe that Eklipse would be capable of achieving this."

METHOD / APPROACH

What are the steps to be implemented to prepare for a process of consultation on research needs and/or engage into societal debate:
A cross disciplinary approach is favoured with a small steering group including the requester, an ecologist (e.g. Kevin Gaston), a physicist specialisingin EMR and an engineer.

Based on a call for knowledge and the pre-screening of literature, this steering group would conduct a first review and identify main areas of evidence gaps/needs.

The Call for knowledge (March 15 to April 18) generated some activity on the forum with 7 experts providing resources with a few new references compared to the first screening of literature

The first knowledge gap analysis can be then submitted to a larger consultation for scientists to provide their views on the questions.

What sources of knowledge should be included?
· Scientific
Published but also unpublished information would be very useful especially when "no-effect" has been found

What is the level of controversy?
Potentially high but with little evidence currently.

Possible activities to be organised to identify research needs or generate societal debate:
- e-conference
- Foresight workshop
- Horizon scanning exercise
- Large participatory summit
- Science café
- webinars

To be further discussed

What are the pros and cons to engage in the previous activities?

Who should be involved in the follow up of the organisation of the chosen process: (call for expert group, targeted experts, etc.)

For the steering group:
Requester Matt Shardlow
Prof.Dr. Mario Babilon
I got my final degree in physics ("DiplomPhysiker") in July, 2001 from the Technical University of Darmstadt. Thereafter I was graduating in nuclear physics. During that time I spent one year at Wright Nuclear Structure Lab at YALE University in the United States as a visiting assistant in research. I got my Ph.D. in December 2004. I spent about one more year as a post-doc in Darmstadt, before I switched to industry. I started a career in the corporate research department of BOSCH. Meanwhile I was giving lectures at the Cooperative State University in Stuttgart. I completely switched to the University in 2011 and since then I am a professor in computer science.

Prof. Kevin J Gaston
I lead basic, strategic and applied research in ecology and conservation biology, with particular emphases at present including common ecology and the decline of common species, urban ecology, human-nature interactions, and the ecology of nighttime. I was founding Director of the Environment and Sustainability Institute (ESI) from 2011 - 2017. I am an Honorary Professor at South Africa's University of Stellenbosch and an ISI Highly Cited Researcher.
I am also a member of the Biosciences department in the College of Life and Environmental Sciences.

Dr Thomas Tscheulin
PhD in Population Ecology from Imperial College London, is currently an Assistant Professor at the University of the Aegean, Greece. He has a strong track record of collaborative research, both within and between host institutions in three different European countries. His main research interest is to relate assessments of the abundance, diversity, functional structure and trophic interactions of invertebrates, to the impacts of ecosystem disturbances such as agricultural practices, alien species invasion, climate change, wildfires, habitat loss and degradation. He is an associate editor for Animal Conservation and has so far published 36 scientific papers.

Dr.BenoîtStockbroeckx
Mr.Stockbroeckx received the degree of Electrical Engineer from the Universitécatholique de Louvain (UCL), Louvain-la-Neuve, Belgium, in 1993, with a thesis on the S-matrix characterization of microwave-optical transducers. In 1993.
He is now the the head of laboratory division of the ANPI in charge of Alarm systems, active fire prevention, theft prevention, CE marking (EMC, LVD, CPD/CPR), electromagnetic compatibility, assessment of people exposure to electromagnetic fields

Requester Buglife (CEO Matt Shardlow)
Buglife is the only organisation in Europe devoted to the conservation of all invertebrates, and we are actively working to save Britain's rarest little animals, everything from bees to beetles, worms to woodlice and jumping spiders to jellyfish. There are more than 40,000 invertebrate species in the UK, and many of these are under threat as never before. Invertebrates are vitally important to a healthy planet – humans and other life forms could not survive without them. The food we eat, the fish we catch, the birds we see, the flowers we smell and the hum of life we hear, simply would not exist without bugs. Invertebrates underpin life on earth and without them the world's ecosystems would collapse.

DETAILS OF THE REQUEST
What is the focus of therequest?
Impact of artificial EMR on wildlife

What is the geographical range? (e.g. all Europe, biogeographical areas, some countries or sites…)
World, EU

Which specific aspects are of interest here?

How narrow could the question get before it stops being policy-relevant?

Advice on possible Methodologies to be used for either consultation on research needs or societal debate

Other:
Questions remaining for requester:

EXPECTED OUTPUTS (quantitative, qualitative… means, ratios…)
Report to summarize state-of-the-art and knowledge gaps

EXPECTED OUTCOMES (policy, negotiation, management, other)
Need to explore current EU level Policies on EMR

What are the consequences of getting it wrong, original request?
- medium (e.g. a wrong policy/decision can be adapted/adjusted later
- unacceptable (e.g. large economic/political/environmental costs)

Time frame of the policy process:
Need quality output so timeframe should be flexible but looking at one year

Steps and timeline for the selected process:
- *June 2017: First Steering group meeting to identify next steps for the analysis of documents and planning of the foresight activity*
- *July-September: analysis of publications*
- *August: second call of the steering group*
- *July-August Admin planning of the foresight activity/consultation (e.g. tender)*
- *End of September: results of the first analysis*
- *October: development of a knowledge gap background document*
- *Sept- Oct- Nov2017: Organisation of the consultation*
- *Early December: consultation/foresight activity*

EXPERTS to be involved:
Foresight activity/consultation should be open to all relevant experts including policy makers to contribute to the identification of priority research needs