A review of environmental protection goals: what are the options for Great Britain?

Amy Brooks

22nd International Akademie Fresenius ECOTOX conference, 6th December 2022

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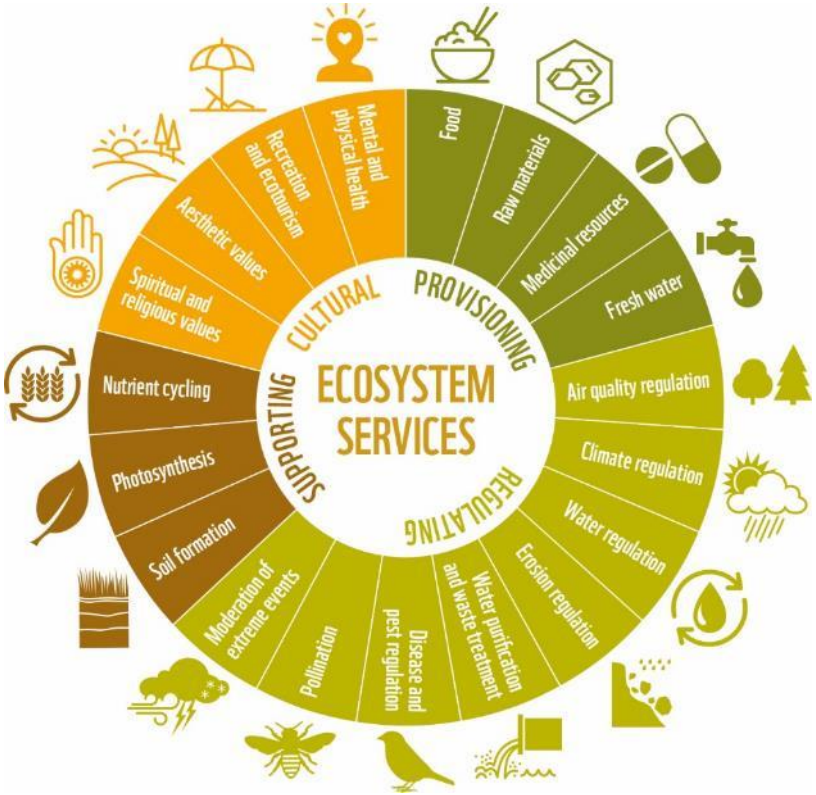
CAMBRIDGE ENVIRONMENTAL ASSESSMENTS

Why have we done this project?

- UK no longer part of the EU
- Opportunity to diverge in how we regulate pesticides, including the protection goals we use
- HSE CRD advertised a public tender to investigate how other regulatory regions set their environmental protection goals and what the options might be for GB
- This presentation is a summary of the final report prepared for CRD

Spoiler alert…

We have proposed that an **ecosystems services** approach could be used in Great Britain for setting protection goals for pesticides



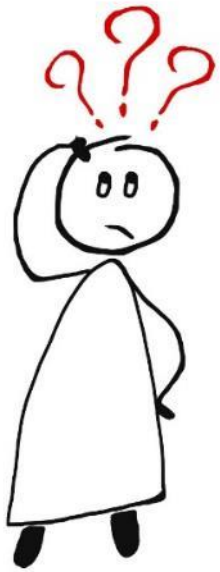
Graphic from: https://goldridgercd.wordpress.com/2017/09/26/biodiversity-makes-us-stronger-and-more-resilient/

Well defined protection goals are key to the environmental assessment of pesticides

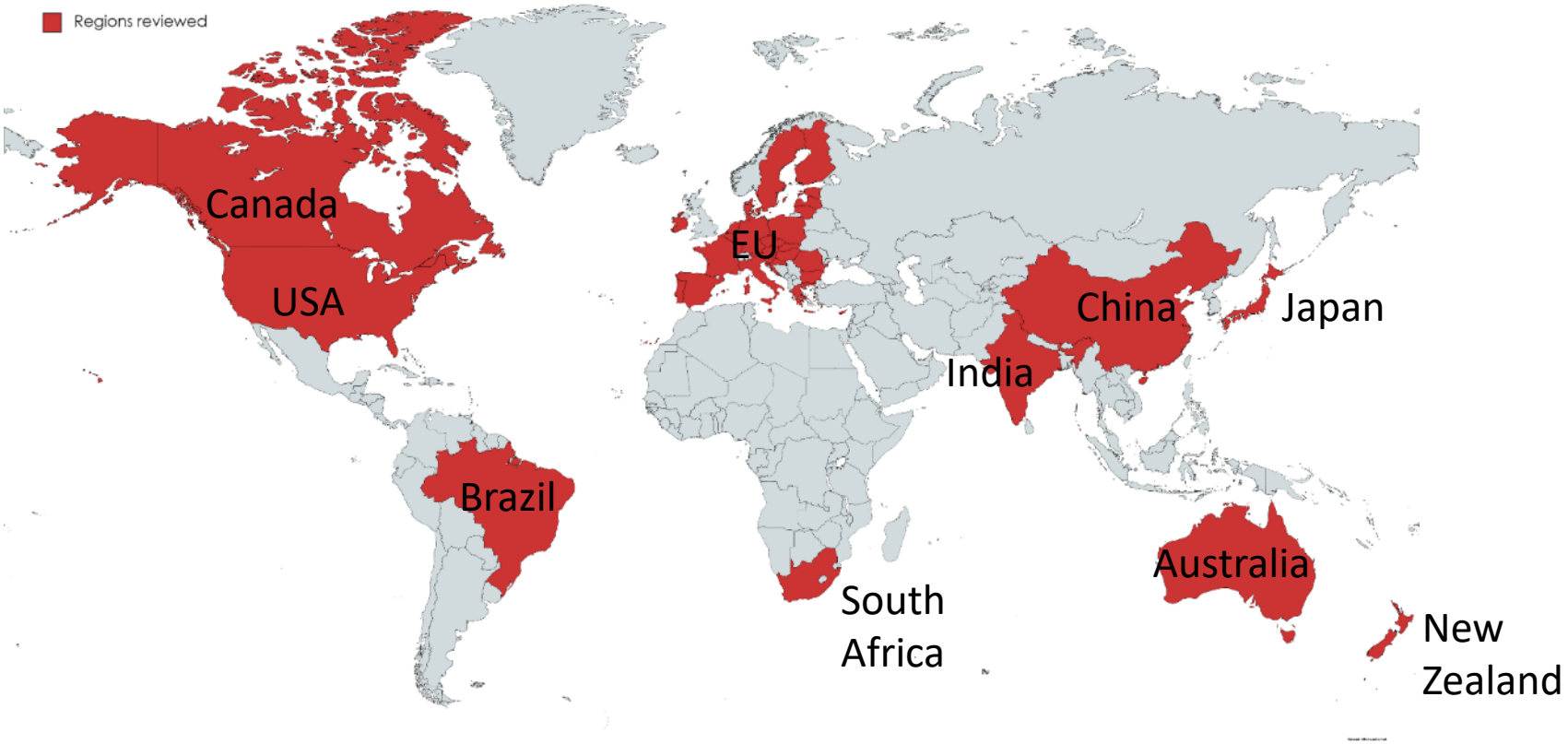
- Need to be clear what we are intending to protect i.e. why are we generating data and doing risk assessments for pesticides?
- If we know what we're trying to protect, we know whether or not to authorise particular uses of a pesticide

Clear protection goals are more useful for stakeholders

- **Industry:** what is the aim of the assessment → what effects and exposure data are required → what required to demonstrate acceptable risks in the dossier and why
- **Risk assessors:** what is acceptable and why → appropriate recommendations made
- **Risk managers:** clear idea of the protection goals → informed decisions regarding approvals
- **The public:** need to understand why particular decisions have been made and the implications of those decisions – pros and cons



Reviewed approaches for setting environmental protection goals in 10 regulatory regions:



→What is everyone else doing? Do we want to do that in GB?

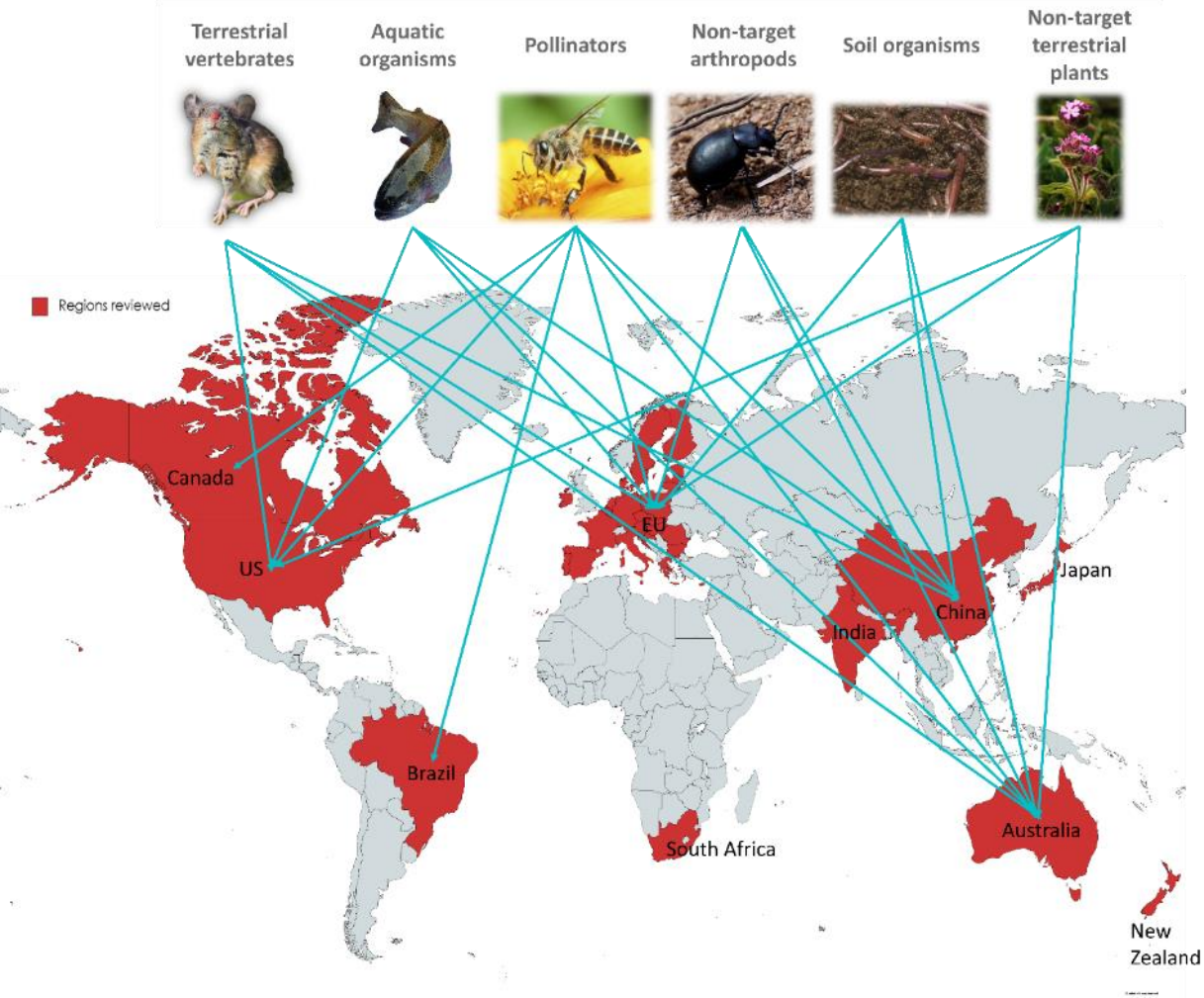
General protection goals exist in all 10 regions

- Mainly relating to ‘no adverse effects’ on the environment or equivalent
- Implies some level of effect may be acceptable, but:
  - what **level** of effect is considered adverse?
  - **where** in the environment does the protection goal apply?
  - over what **time period**?
  - **why** it is important?

Example of a general protection goal – Australia

- Section 5A of the Agricultural and Veterinary Chemicals Code Regulations 1994 (referred to as the 'Agvet code'), 'Definition of meets the safety criteria' states that:
  - An active constituent or chemical product meets the safety criteria if use of the constituent or product, in accordance with any instructions approved, or to be approved, by the APVMA for the constituent or product or contained in an established standard:
  - [...]
  - (c) is not, or would not be, likely to have an unintended effect that is harmful to animals, plants or things or to the environment.
- The **overall protection goal in Australia is for PPPs to be unlikely to have an unintended effect that is harmful to animals, plants or things or to the environment**.
- It is further stated in several appendices of the APVMA Environment Risk Assessment Manual that the **general protection goal is to protect biodiversity and ecosystems**.
- The Environment Risk Assessment Manual is not legally binding - but without using it, it would be difficult for the Australian regulator (APVMA) to implement the AgVet Code as required

Specific protection goals exist in some regions



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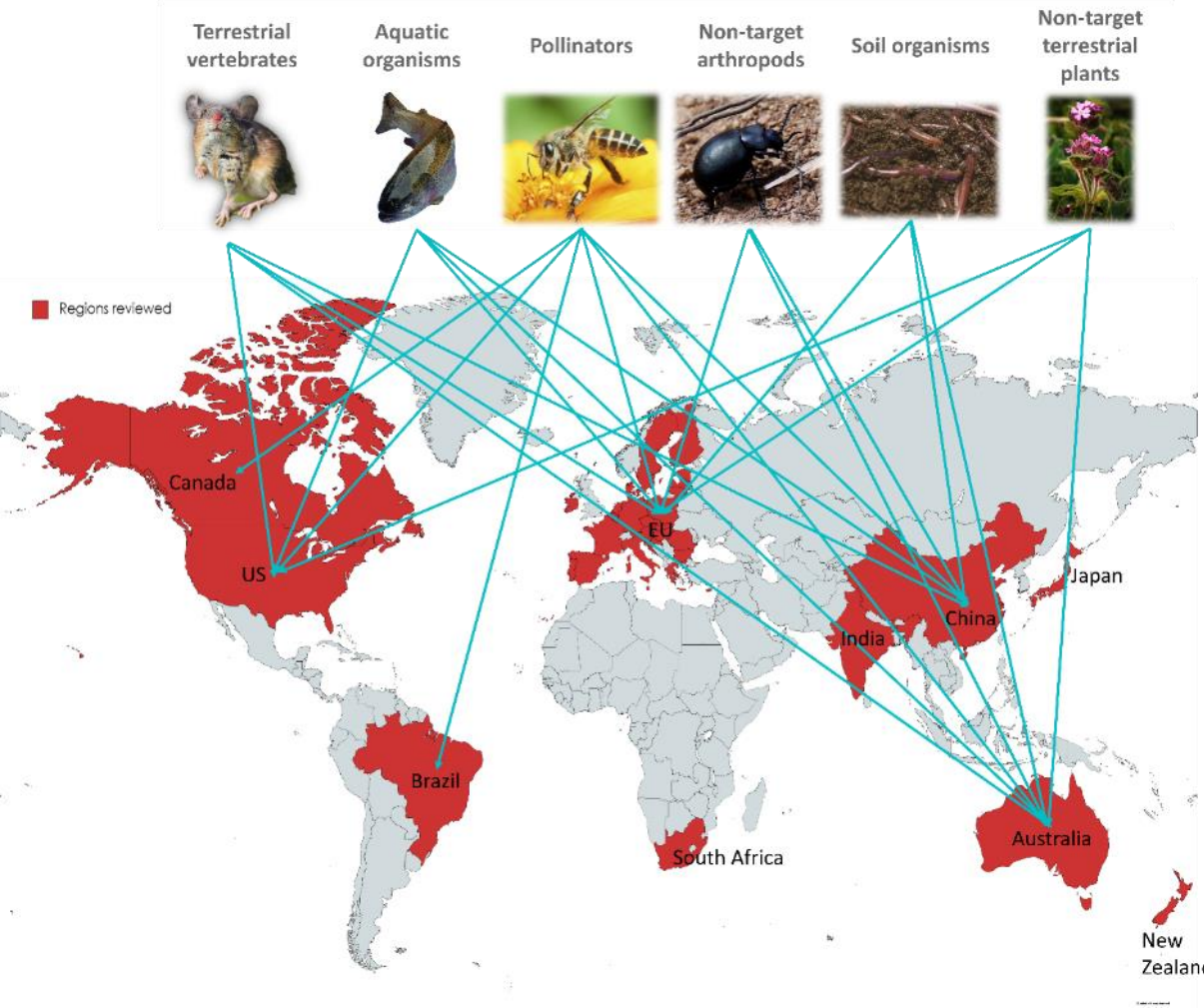


- All 6 in EU and Australia
- None in NZ, SA, Japan and India
- Only pollinators in Brazil and Canada
- Pollinators has most regions with SPGs
- PGs set for individual wildlife groups and RAs for each group
- Most PGs focus on ecosystem structure

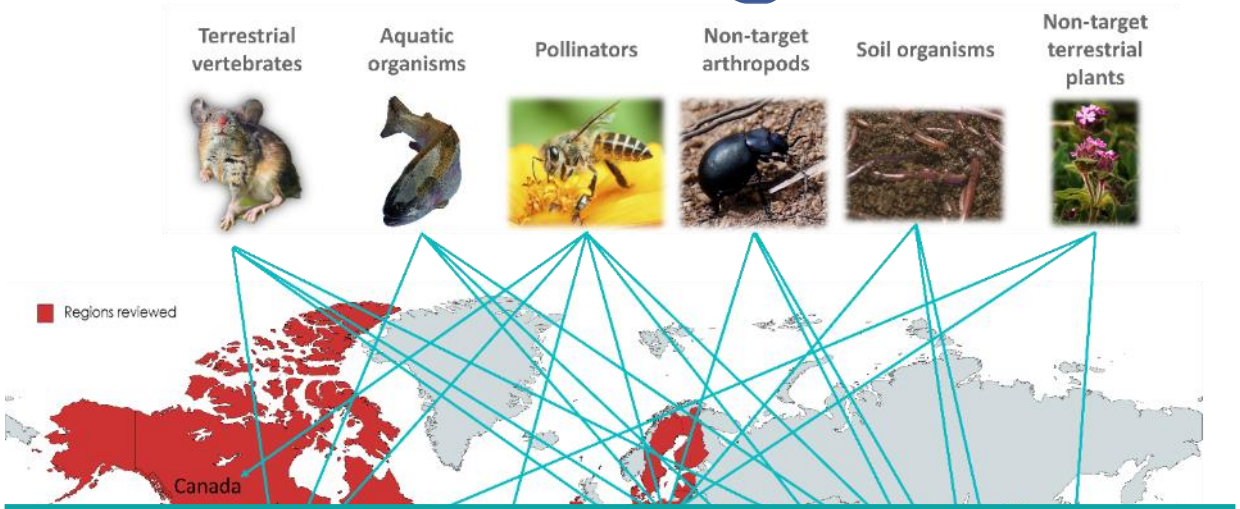
Example specific protection goal – aquatic organisms in Australia

Stated in Appendix B (April 2020) of the Environment Risk Assessment Manual:

'*The protection goal for aquatic species aims to protect aquatic plants and animals at the* ***population level*** *in surface water, and aquatic vertebrates at the* ***individual level*** *so that mortality and suffering due to acute toxicity is avoided*.'

Aquatic plants and invertebrates are protected at the population level; aquatic vertebrates at the individual level.

Specific protection goals exist in some regions



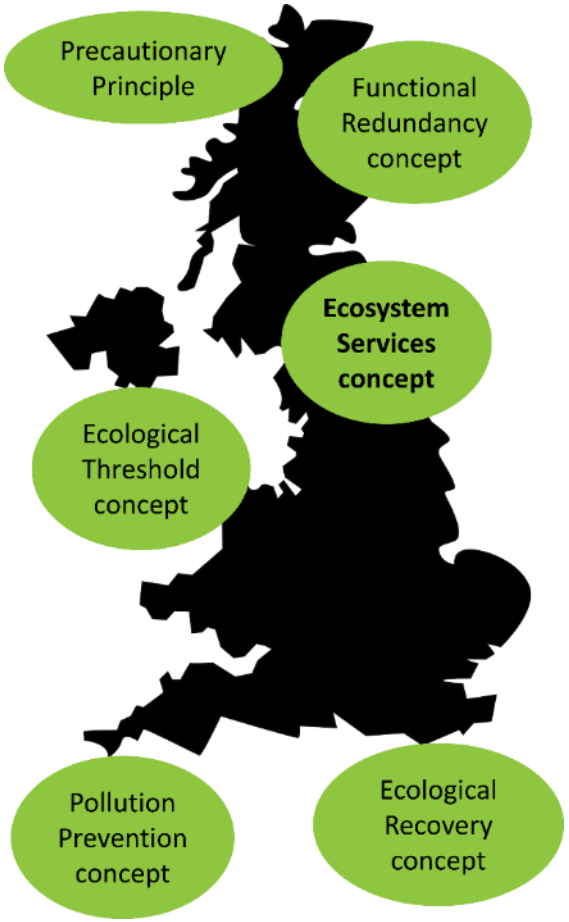
Even where specific protection goals do exist, they tend to be quite broad - not 100% clear on what to protect, where and why…

Doesn't seem to be a 'better' protection goal framework that Great Britain could adapt…

Do risk assessments address protection goals?

- Aspirational vs achievable?
- Only the EU appears to have attempted a **calibration exercise** - not for all wildlife groups, or for all aspects within a wildlife group
  - E.g. acute RA for B&M ☺ (for some)
  - E.g. repro RA for B&M ☹
- **Without a comprehensive calibration step, we do not know whether the intended protection goals are being achieved (or over-achieved)**

Options for protection goal setting in GB?



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Development of a framework based on an ecosystem services approach for deriving specific protection goals for environmental risk assessment of pesticides

Karin M. Nienstedt [a,1], Theo C.M. Brock [b], Joke van Wensem [c], Mark Montforts [d], Andy Hart [e], Alf Aagaard [a,2], Anne Alix [f], Jos Boesten [b], Stephanie K. Bopp [a,*], Colin Brown [g], Ettore Capri [h], Valery Forbes [i,3], Herbert Köpp [j], Matthias Liess [k], Robert Luttik [d], Lorraine Maltby [l], José P. Sousa [m], Franz Streissl [a], Anthony R. Hardy [n]

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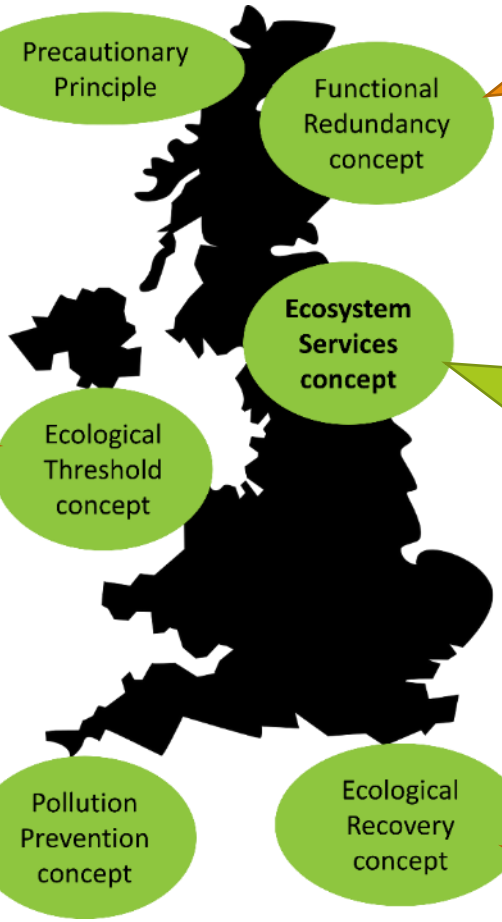
Aquatic Risks of Pesticides, Ecological Protection Goals, and Common Aims in European Union Legislation

Theo CM Brock,† Gertie HP Arts,† Lorraine Maltby,‡ and Paul J Van den Brink†§*

Options for protection goal setting in GB?

This principle '*enables decision-makers to adopt precautionary measures when scientific evidence about an environmental or human health hazard is uncertain and the stakes are high*' (EPRS 2016)



This concept assumes that a decrease in biodiversity can be tolerated if key species and their functions are not affected beyond an unacceptable threshold.

This concept aims to prevent treatment-related ecological effects by always protecting sensitive populations and processes in ecosystems

Ecosystem services can be defined in several ways but are essentially the services provided by the ecosystem that benefit humans. Thus exposure to pesticides can be limited to levels that allow the delivery of the services that are deemed important for human wellbeing.

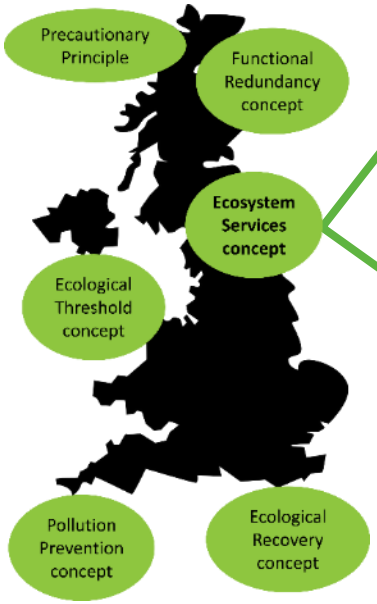
This concept aims to prevent pollution as much as technologically and socioeconomically feasible

Exposure to pesticides should be limited to levels that cause reversible impacts on the most sensitive populations.

Propose an **ecosystem services** approach

- Growing support in EU and US for this approach
- Ecosystem services ~ services provided by the ecosystem that benefit humans e.g. provisioning services, regulating services, cultural services
- Limit pesticide use to levels that allow delivery of services deemed important for human wellbeing

An ecosystems services approach could:

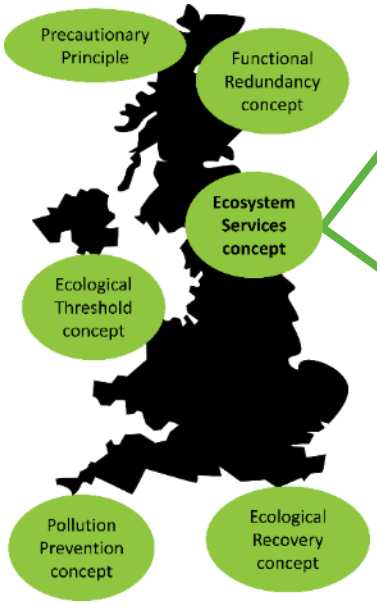


- Answer the what, where, when and why questions
- Assess the environmental and socio-economic impacts, acknowledging we cannot protect everything, everywhere, all the time, without some compromises; cost-benefit analysis…

Cost-benefit analysis

- Ecosystem services approach promotes use of a cost-benefit analysis to aid decision-making
- Four of the regulatory regions we reviewed did have provision for a cost-benefit analysis: USA, New Zealand, China, India
- Remaining six regulatory regions we reviewed didn't have provision for this (or it wasn't clear)
- Cost-benefit analysis means not just focussing on the potential negative impacts ('costs') of using pesticides but also the potential benefits e.g. food safety, crop yield, growing locally

An ecosystems services approach could:



- Answer the what, where, when and why questions
- Assess the environmental and socio-economic impacts, acknowledging we cannot protect everything, everywhere, all the time, without some compromises; cost-benefit analysis
- Provide more transparent decision-making for pesticide approvals
- More effective communication between government agencies working within different regulatory frameworks using common currency of ecosystem services
- Include the goals of the Defra 25-year plan to protect and grow natural capital…

Defra 25-year plan

- An ecosystem services approach would be in line with the Defra 25-year plan (Defra 2018), which includes 'protecting and growing natural capital', where natural capital is defined as:

  '*the sum of our ecosystems, species, freshwater, land, soils, minerals, our air and our seas. These are all elements of nature that either directly or indirectly bring value to people and the country at large*'.

- The 25-year plan aims to consider '*the often hidden additional benefits in every aspect of the environment for national wellbeing, health and economic prosperity, with scientific and economic evidence to the fore*'.

- The goals of the 25-year plan could be captured within the ecosystem services assessment e.g.

  1. Clean air
  2. Clean and plentiful water
  3. Thriving plants and wildlife….etc

Significant work already undertaken in the literature on using an ecosystem services approach for pesticides e.g...

Further work required to implement ES approach in GB

- e.g. **define what we want to protect in GB** - what is the baseline? Where does it apply? Who makes those decisions?
- E.g. develop **new test guidelines** for any data gaps
- e.g. **develop further models** to allow connection between results observed in regulatory studies and ecosystem services
- e.g. **clear delegation of roles and responsibilities** between risk assessment and risk management

Current status

- This initial project is now complete
- New guidance documents currently being developed in EU (birds and mammals and bees now drafted; soil/NTAs on their way…)
- B&M and bees notified in EU in 2023?
- CRD unlikely to be able to complete the follow up work required to define protection goals before having to review and implement new guidance documents
- Timelines not aligned
- We don’t live in an ideal world!

Thanks to HSE CRD for commissioning this project (project PS2824) – full report is now publicly available

Thanks to the many people around the globe that we contacted as part of this project regarding risk assessment frameworks and legislation in the various geographical regions

Thanks also to Alan Lawrence and Lorraine Maltby for reviewing the draft report

Any questions?

Contact the author: amy.brooks@cea-res.co.uk

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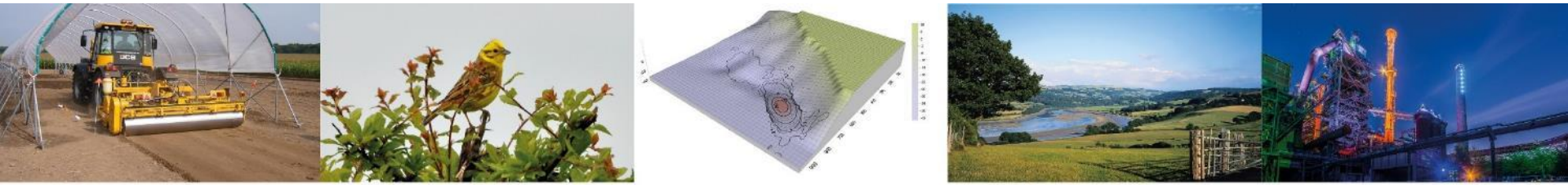

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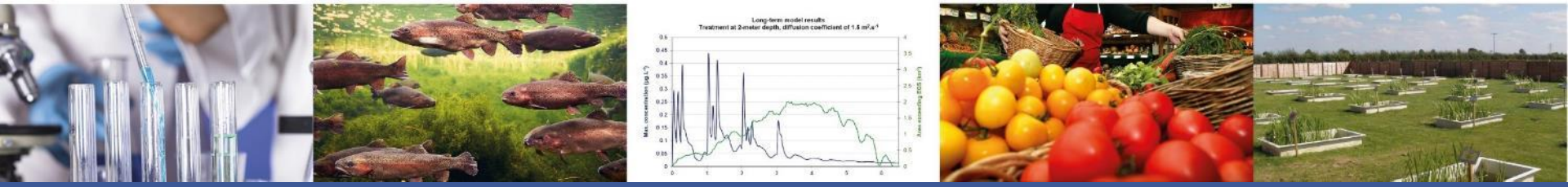
PROVIDING NOVEL SOLUTIONS FOR AN INCREASINGLY DEMANDING REGULATORY WORLD