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

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ERAR, York, 14th June 2022

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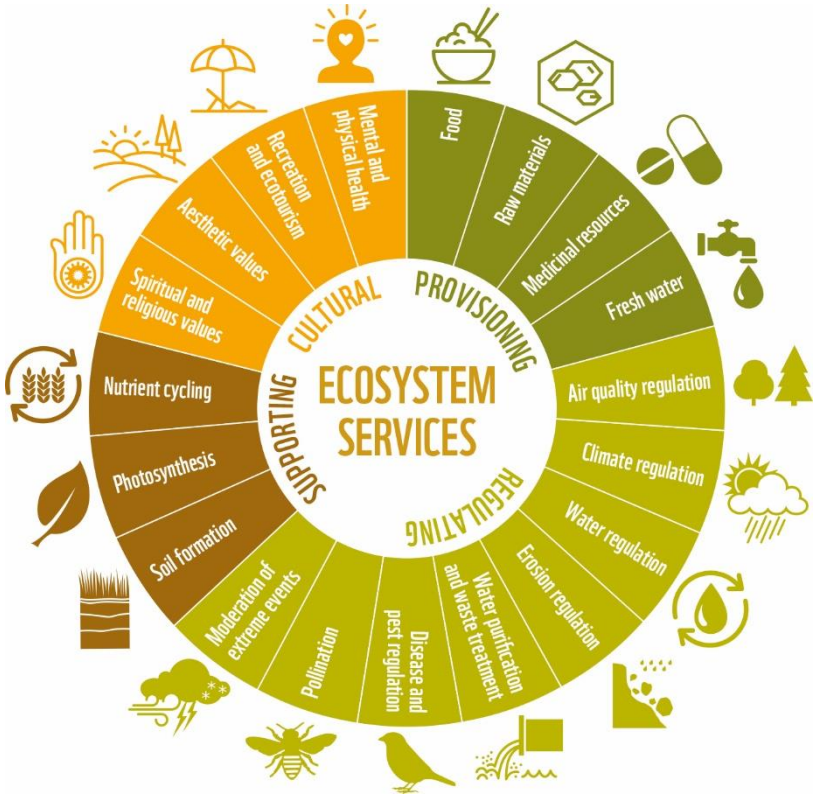
Why have we done this project?

- 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



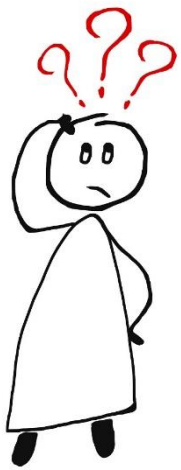
Graphic from: https://goldridgercd.wordpress.com/2017/09/26/biodiversity-makes-us-stronger-and-more-resilient/

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

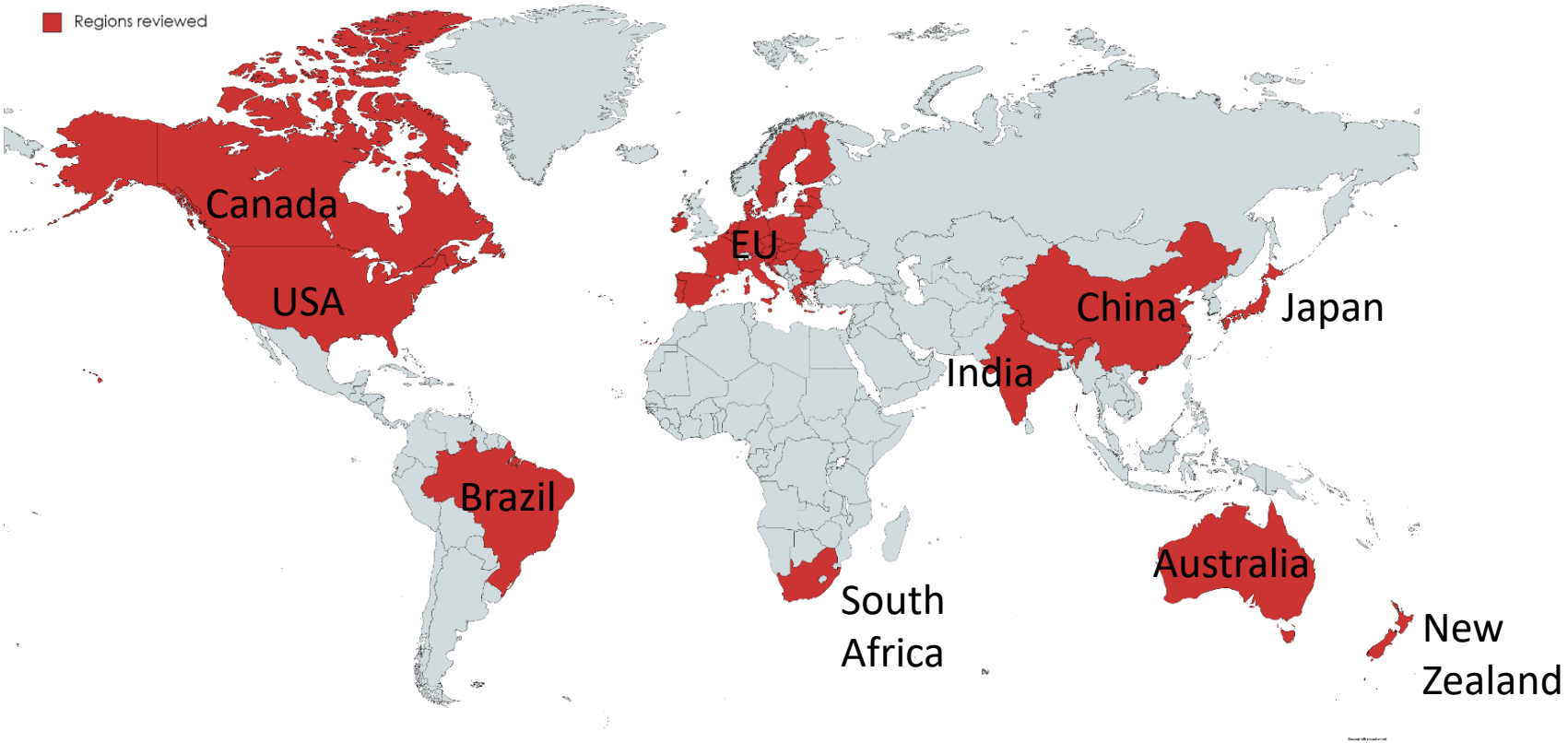
- Need to be clear what we are intending to protect i.e. why are we generating data and doing risk assessments for pesticides?
- If we know what we're trying to protect, we know whether or not to authorise particular uses of a pesticide

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?

Specific protection goals exist in some regions

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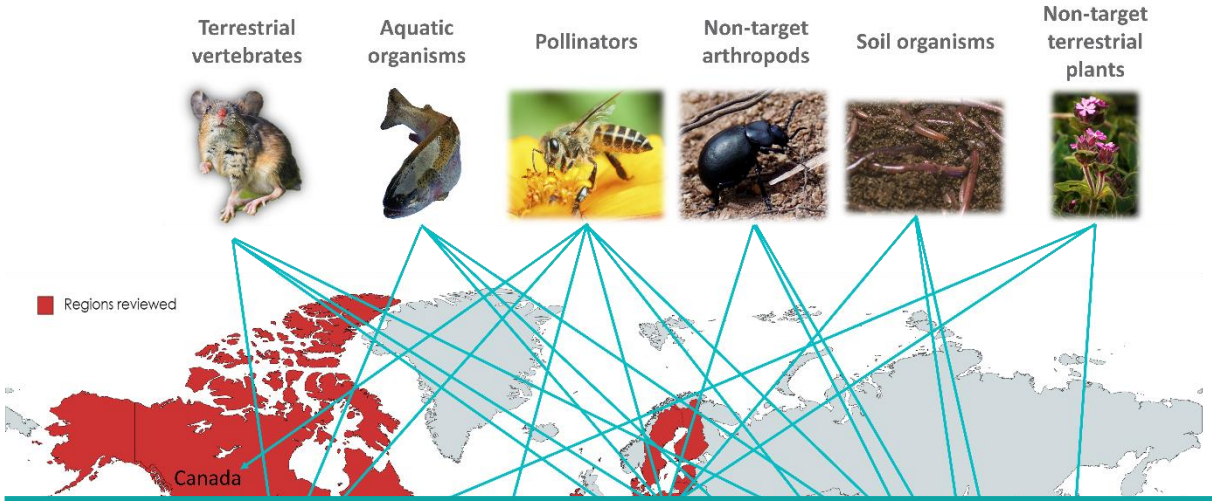


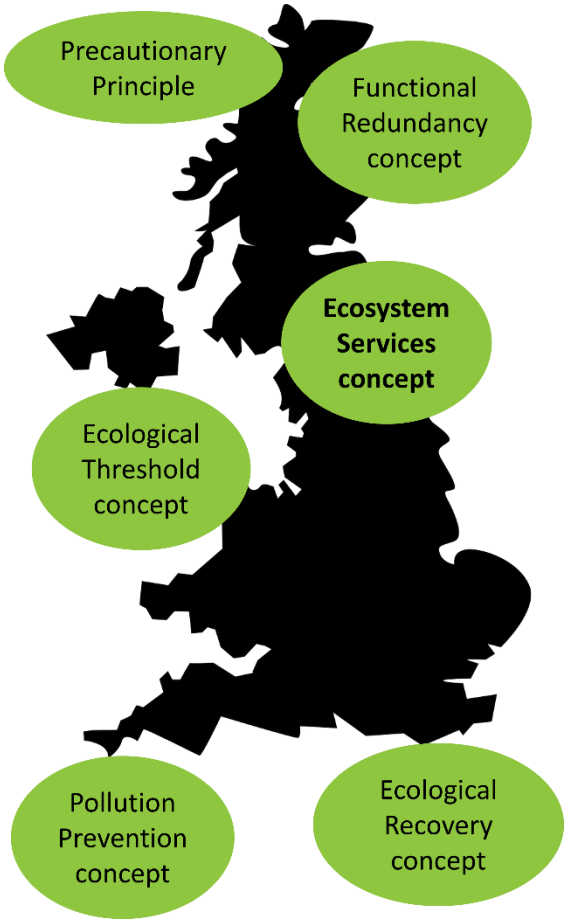
Even where specific protection goals do exist, they tend to be quite broad - not 100% clear on what to protect, where and why…

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
- **Without a comprehensive calibration step, we do not know whether the intended protection goals are being 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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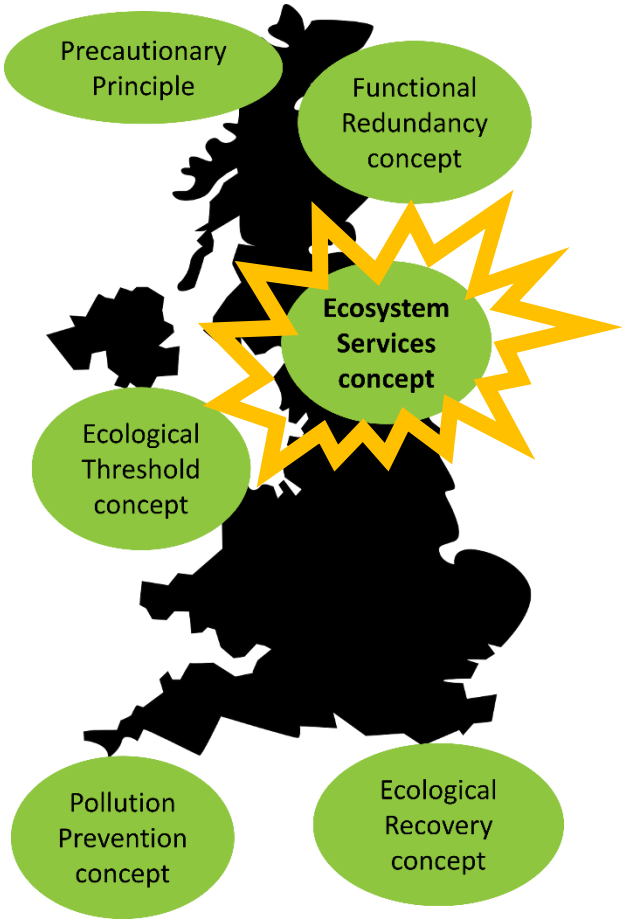
Aquatic Risks of Pesticides, Ecological Protection Goals, and Common Aims in European Union Legislation

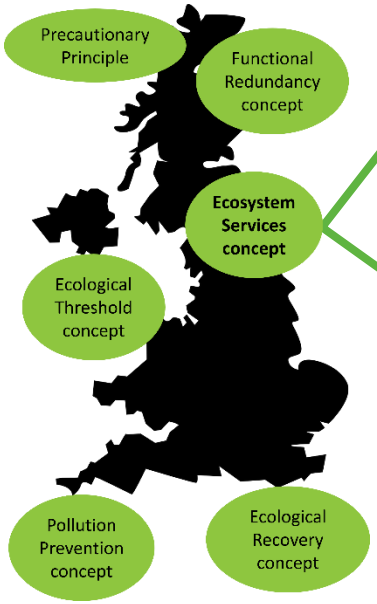
Theo CM Brock,† Gertie HP Arts,† Lorraine Maltby,‡ and Paul J Van den Brink†§*

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. goods, life support processes, 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
- Provide more transparent decision-making for pesticide approvals
- Include the goals of the Defra 25-year plan to protect and grow natural capital
- More effective communication between government agencies working within different regulatory frameworks using common currency of ecosystem services

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** - who gets to make that decision?
- 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

Thanks to HSE CRD for funding this project (public tender HSE/T4011.1) – report will be publicly available soon

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?

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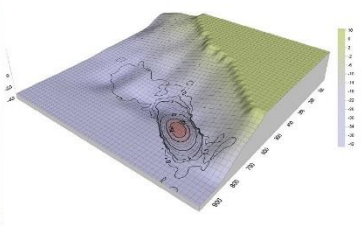

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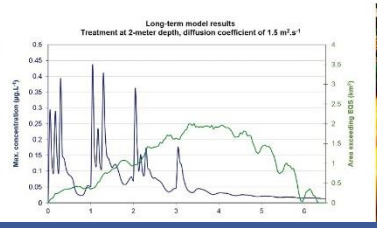
PROVIDING NOVEL SOLUTIONS FOR AN INCREASINGLY DEMANDING REGULATORY WORLD



Further info...

Example of a general protection goal - EU

- *A plant protection product, consequent on application consistent with good plant protection practice and having regard to realistic conditions of use, shall meet the following requirements:*
- *[…]*
- *(e) it shall have no unacceptable effects on the environment, having particular regard to the following considerations where the scientific methods accepted by the Authority to assess such effects are available:*
    - *(i) its fate and distribution in the environment, particularly contamination of surface waters, including estuarine and coastal waters, groundwater, air and soil taking into account locations distant from its use following long-range environmental transportation;*
    - *(ii) its impact on non-target species, including on the ongoing behaviour of those species;*
    - *(iii) its impact on biodiversity and the ecosystem;*

Example specific protection goal

EU terrestrial vertebrates

- No specific protection goal stated in the regulation.
- Current bird and mammal risk assessment guidance (EFSA 2009) provides protection goals:
  - *Surrogate protection goal:* make any mortality or reproduction effects unlikely
  - *Actual protection goal:* clearly establishing that there will be **no visible mortality** and **no long-term repercussions for abundance and diversity**

Table 3.1. Summary of general environmental protection goals for PPPs for various regulatory regions and an indication of where specific protection goals exist for individual wildlife groups.

Geographical area	General protection goal for the environment	Some form of specific protection goal exists (Y/N) for:						#
		Terrestrial vertebrates	Aquatic organisms	Bees	Non-target arthropods	Soil organisms	Terrestrial plants	
EU	No unacceptable effects on the environment, including biodiversity; no endocrine disrupters that cause adverse effects	Y	Y	Y	Y	Y	Y	*6*
US	No unreasonable adverse effects, taking into account economic, social and environmental costs/benefits; must also be compliant with endangered species act	Y	Y	Y	N	N	Y	*4*
Canada	Prevent unacceptable risks to the environment; no harm to the environment	N	N	Y	N	N	N	*1*
Australia	Unlikely to have unintended effect that is harmful to animals, plants or things or to the environment	Y	Y	Y	Y	Y	Y	*6*
New Zealand	Protect the environment by preventing or managing adverse effects of hazardous substances	N	N	N	N	N	N	*0*
South Africa	No significant adverse effects on the environment	N	N	N	N	N	N	*0*
Brazil	Avoid relevant negative impacts on the environment	N	N	Y – for new active substances only	N	N	N	*1*
Japan	No adverse effects on the environment	N	N	N	N	N	N	*0*
China	Protect the environment, beneficial organisms and rare species	Y	Y	Y	Y	Y	N	*5*
India	Prevent risk to animals, which includes wildlife considered desirable to protect or preserve	N	N	N	N	N	N	*0*
	#	*4*	*4*	*6*	*3*	*3*	*3*	

#: Number of 'Y' in row or column i.e. number of regulatory regions that have protection goals for particular wildlife groups

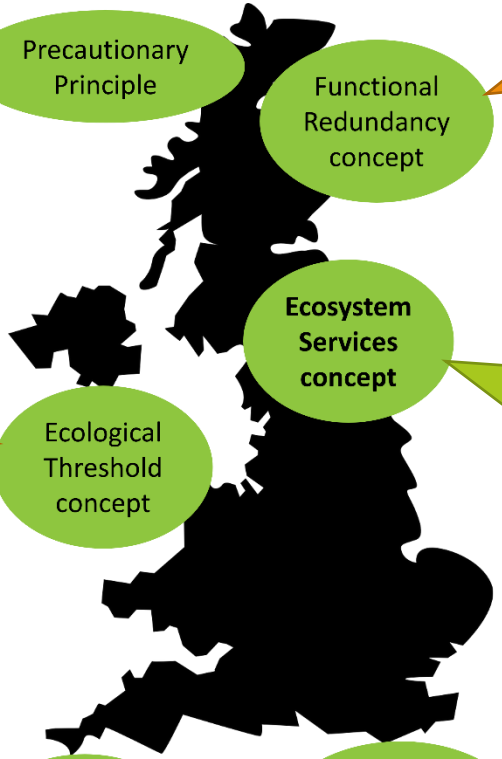
Options for protection goal setting in GB?

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)

Precautionary Principle

Functional Redundancy concept

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



Ecosystem Services concept

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 treatment-related ecological effects by always protecting sensitive populations and processes in ecosystems

Ecological Threshold concept

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

Pollution Prevention concept

Ecological Recovery concept

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

Cost-benefit analysis

- Ecosystems 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)

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 take into account '*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 i.e.

  1. Clean air
  2. Clean and plentiful water
  3. Thriving plants and wildlife
  4. A reduced risk of harm from environmental hazards such as flooding and drought
  5. Using resources from nature more sustainably and efficiently
  6. Enhanced beauty, heritage and engagement with the natural environment