Natural Capital on Irish Farmland

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Prof Jane Stout

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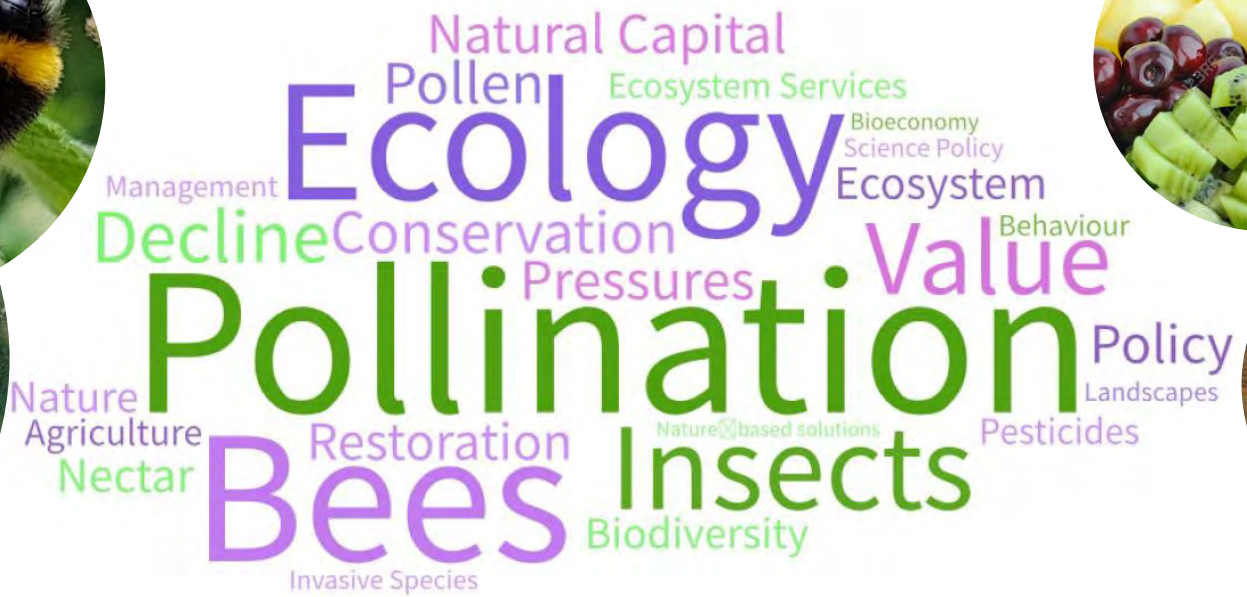
Ecological interactions ⟷ Human society



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stoutj@tcd.ie @JaneCStout
www.campusbuzz.blog

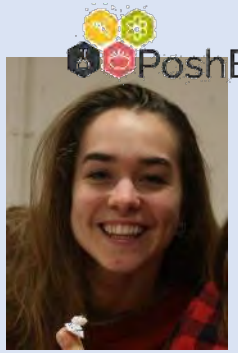
Plant-animal Interactions Research Group

Trinity College Dublin
The University of Dublin

Pesticide, parasite and nutritional status for pollinators on farmland

Sarah Gabel
Impacts of pesticides on hoverflies

Elena Zioga and Alina Premrov: PROTECTS:
Pesticide residues in nectar and pollen,
Soil risk assessment @ProtectsProject



Irene Botterro EU H2020 Bee Health project @poshbee_eu

Biodiversity in relation to landscape features and habitat quality on farmland

Steph Maher: Habitat quality and pollinators on farms

Ceri Green: Enhancing pollinator diversity on farms KEPAK

NBDC: EIP-AGRI Protecting Farmland Pollinators

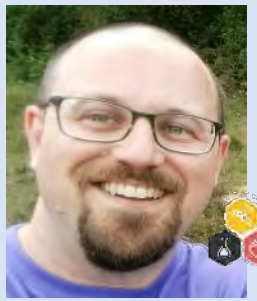
Cian White
Farmland biodiversity

Urban biodiversity

Cian White
Urban Nature-based Solutions for bees @ConnectingNBS

Aoibheann Gaughran
Biodiversity audit for Áras an Uachtaráin

Bumblebees: behaviour and ecology



Jordan Chetcuti Developing the *Bombus* model for ALMaSS framework

Maynooth University
National University of Ireland Maynooth

Sarah Larragy
Commercial *Bombus terrestris*

Natural Capital approach

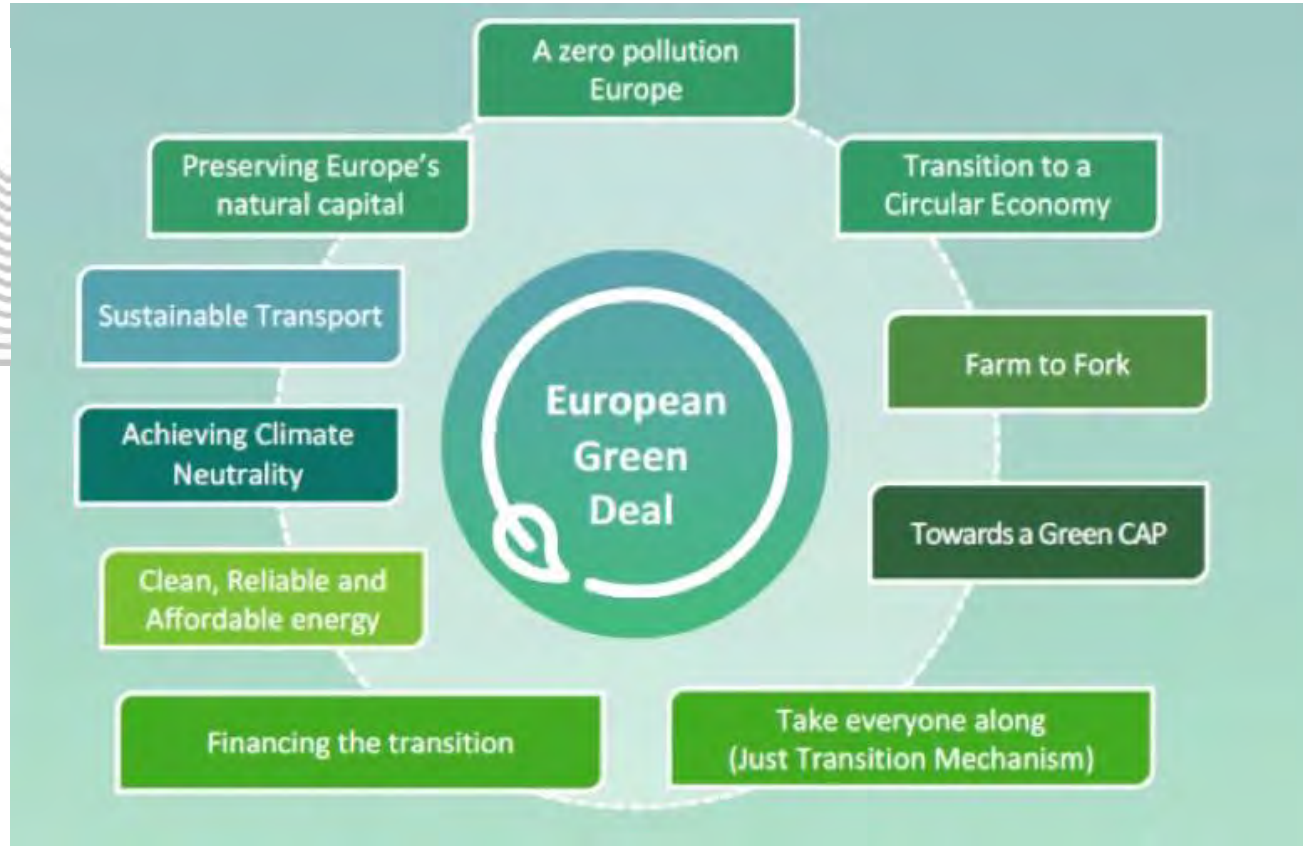
INCASE
Irish Natural Capital Accounting for Sustainable Ecosystems

Catherine Farrell
Natural Capital Accounting @incaseproject

biorbic

Andrew Neill
Natural Capital approach to bioeconomy

Natural capital concept is gaining political traction

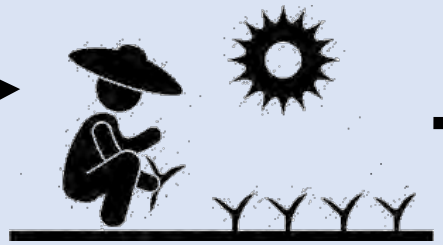


"All EU policies should contribute to preserving and restoring Europe's natural capital"

What is natural capital?

Ecosystems, geosystems, atmospheric systems
“nature”

STOCKS



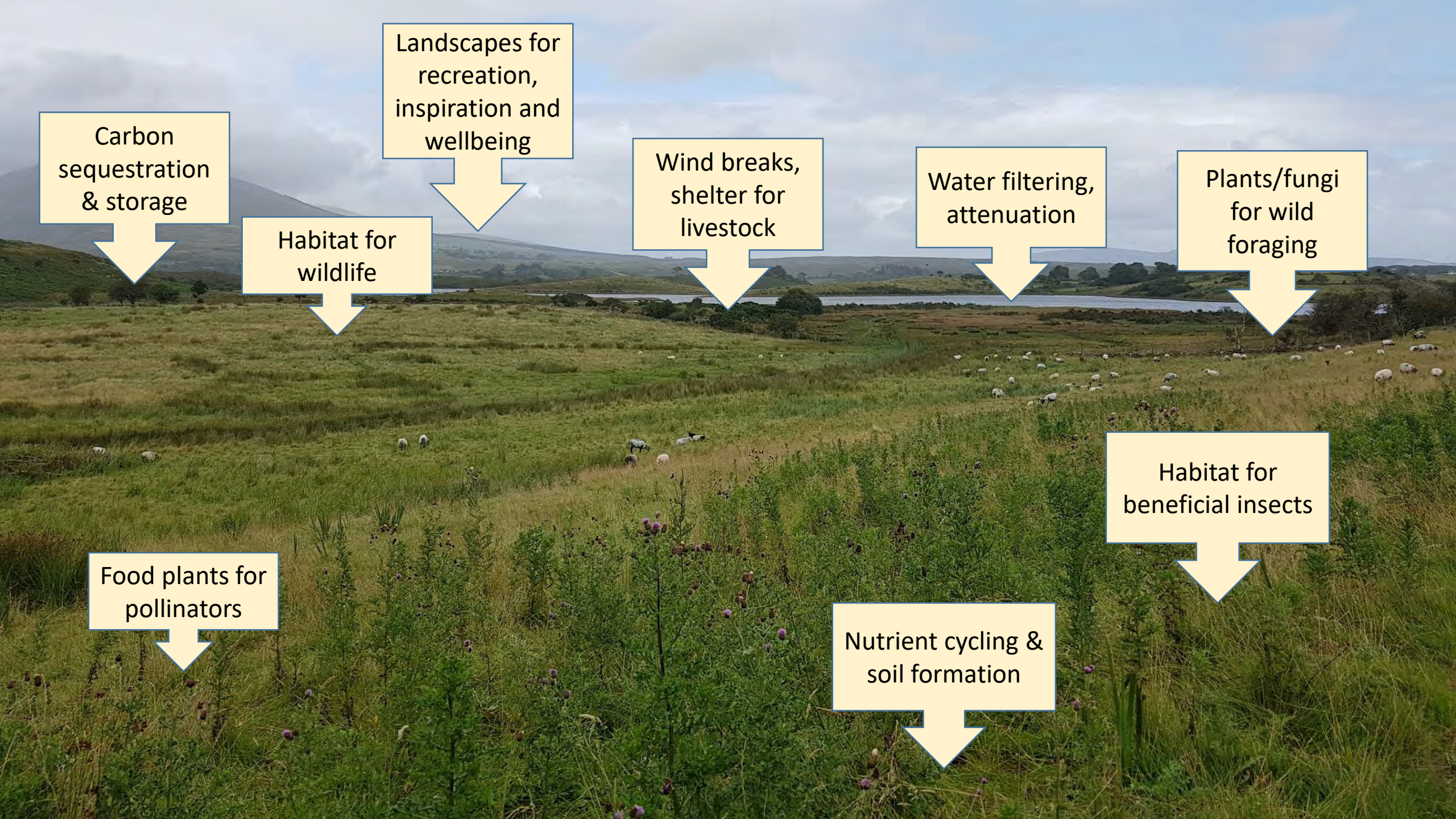
Biomass

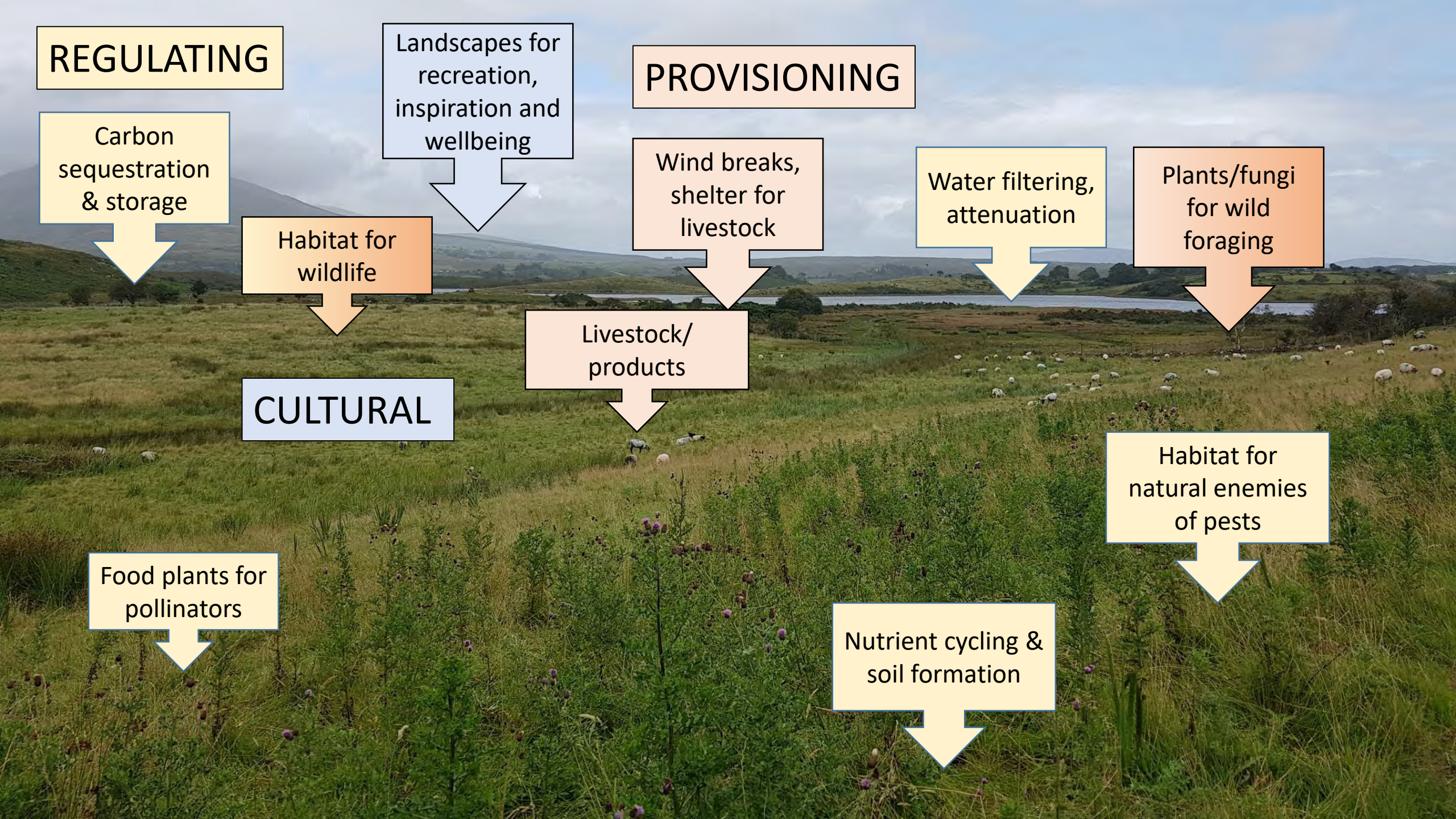
Marketable products/ goods

FLOWS

Economic activity

Ecosystem services – the outputs from ecosystems that have benefit and value to humanity


Carbon sequestration & storage
Landscapes for recreation, inspiration and wellbeing
Habitat for wildlife
Wind breaks, shelter for livestock
Water filtering, attenuation
Plants/fungi for wild foraging
Habitat for beneficial insects
Food plants for pollinators
Nutrient cycling & soil formation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Habitat for natural enemies of pests
Food plants for pollinators
Nutrient cycling & soil formation

Ecosystem services by farmland insects

Image credit: Annie Smith

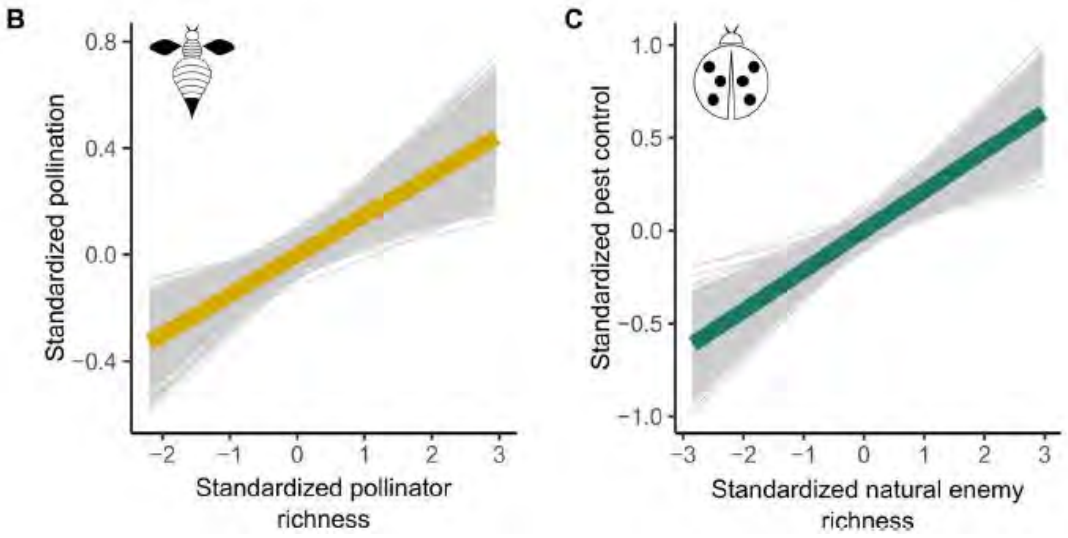
Image credit: Aoibheann Gaughran

Image credit: April Nobile

- Flower-visitors act as pollinators
- Dung beetles bury dung – reduces spoiling, recycles nutrients, reduced pests and disease
- Natural enemies regulate populations of pests
- Ants are seed dispersers and soil bioturbators

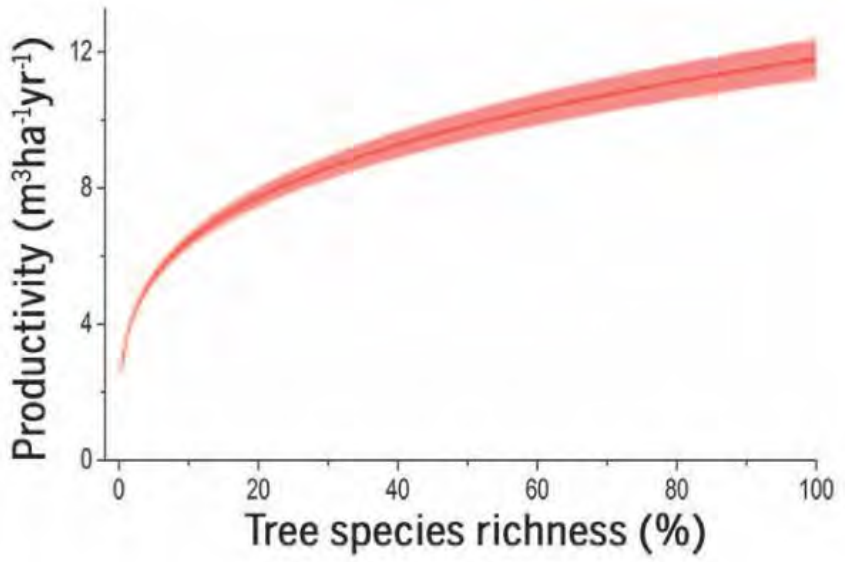
Diversity matters!

More species => more pollination and pest control in farmland



Dainese et al. 2019 Science Advances

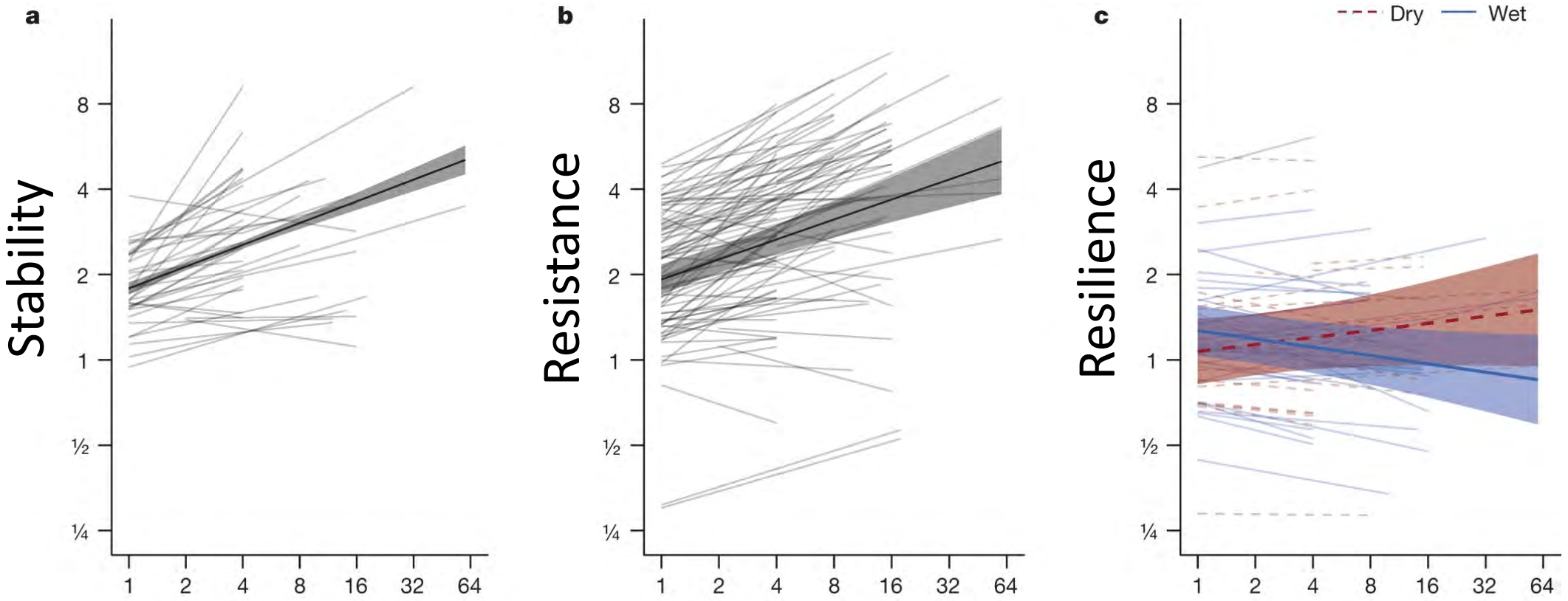
More species => more biomass in forests

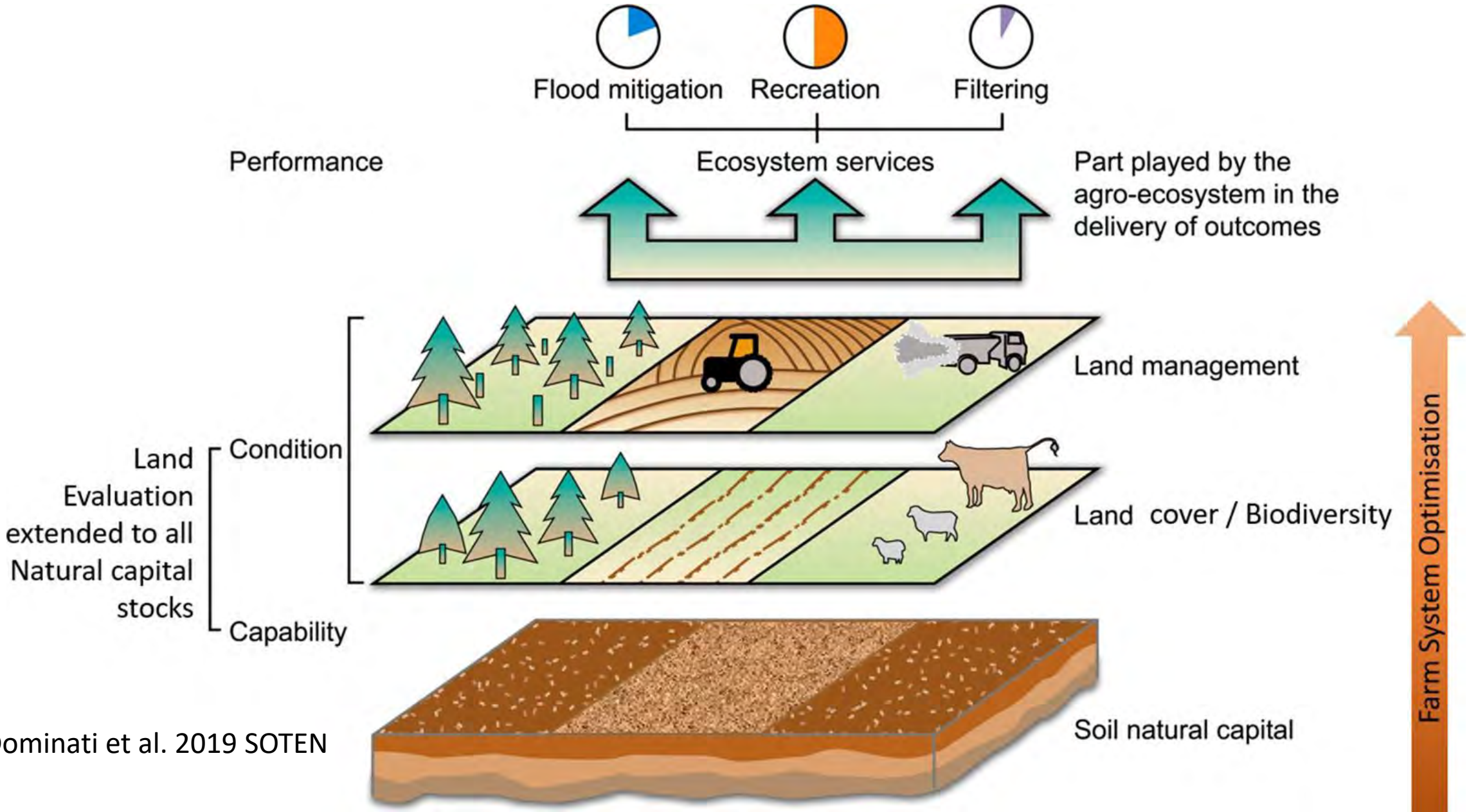


Liang et al. 2016 Science

Multispecies grassland swards outperform PRG in terms of production in plots: “55% grass, 35% legume and 10% herb performed the best – in both the spring and the autumn” Sheridan et al. 2019 SMARTGRASS

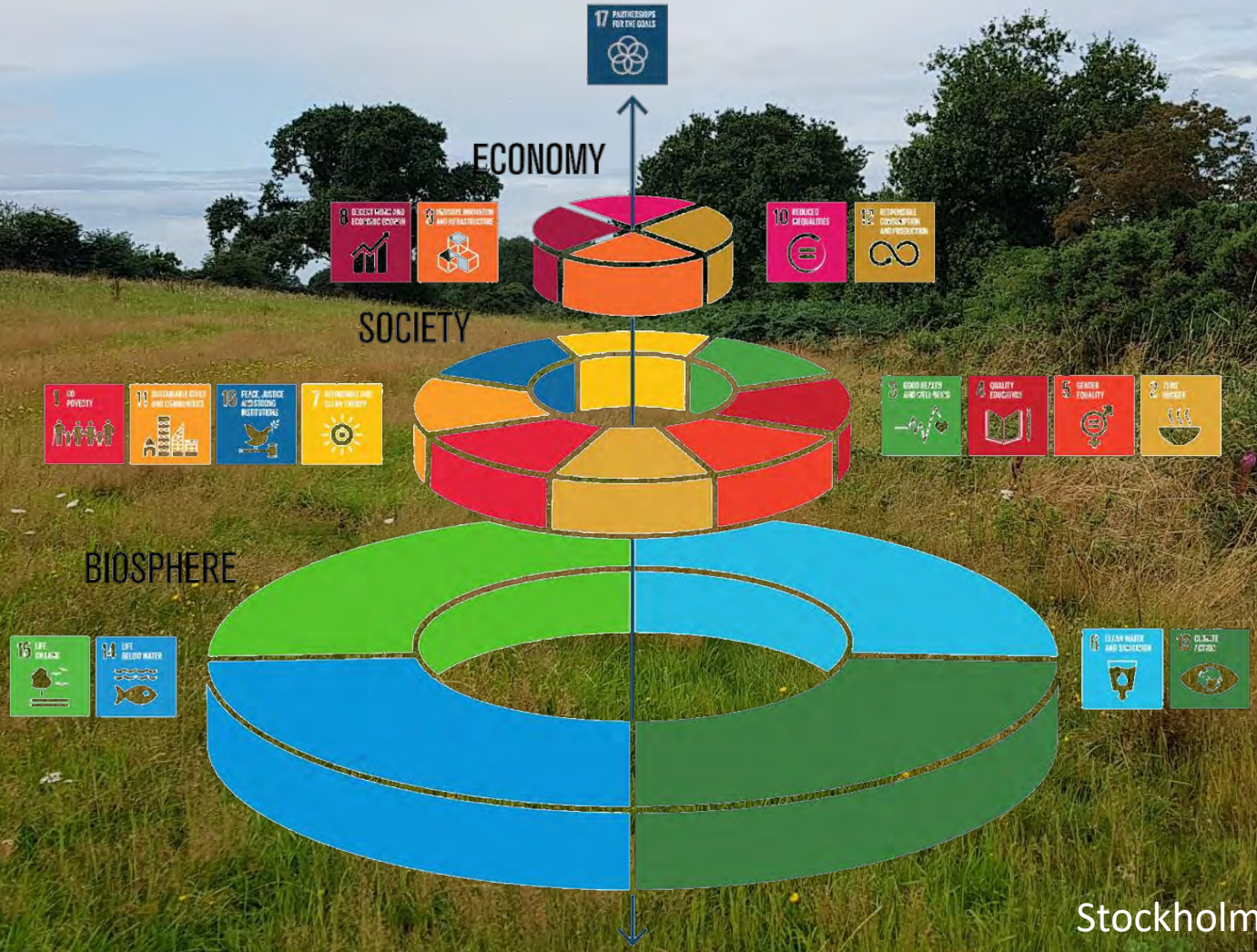
Diversity matters!





Dominati et al. 2019 SOTEN

Natural capital underpins society and economy



Stockholm Resilience Centre 2016




✗ Natural capital is not about putting a price on nature

✓ Natural capital is about valuing nature

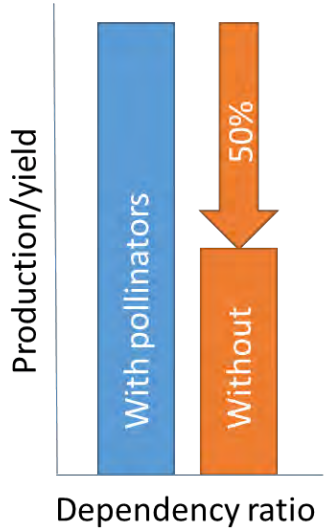
Total value of nature

- ✓ Marketed goods: price can be used as a proxy
- ✓ Non-market goods: use, preference, replacement costs used as proxies
- ✓ Everything else: no price, but doesn't mean no value

- Price doesn't reflect all costs of production
- eg surveys, measures of activity

Value of pollinators and pollination services

Crop pollination



x yield x price

Home produced crops worth **€20-59 million** per year (2005-2014)

Marketed goods

Non marketed benefits

Ecological function

Future potential

Existence value

Bequest value

Stout et al. (2019)

So why convert value of nature to €€??

- Draw attention
- Reveal scale of problem

All-Ireland Pollinator Plan
www.pollinators.ie
Implementation coordinated by the National Biodiversity Data Centre

https://areebaclimatechange.weebly.com/how-does-the-loss-of-biodiversity-affect-us-economically.html

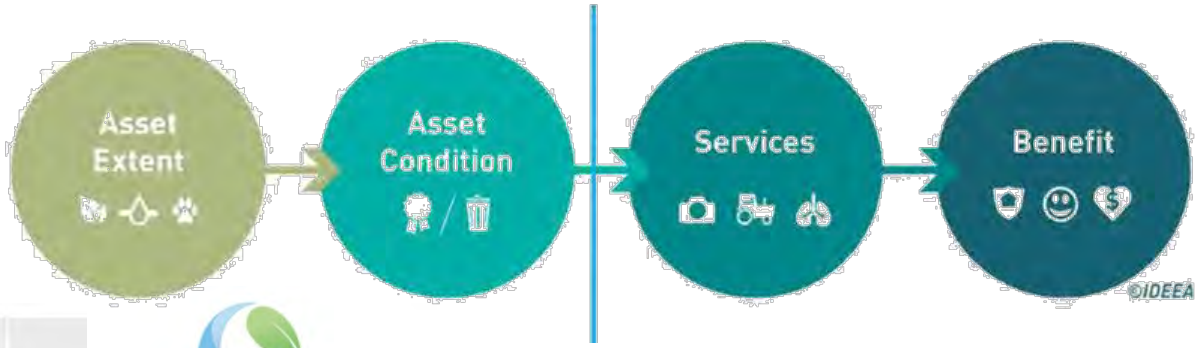
Natural Capital Accounting

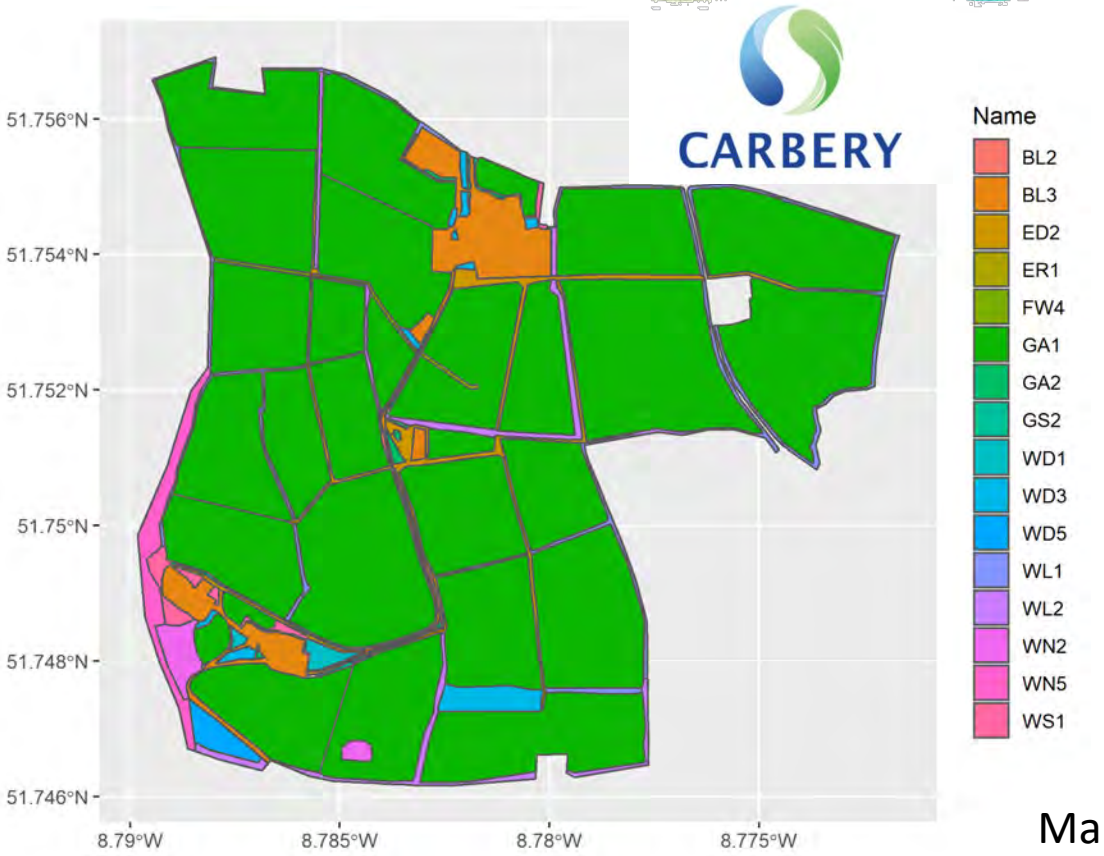
INCASE

Irish Natural Capital Accounting for Sustainable Environments

https://www.incaseproject.com/

Natural Capital Accounting





Extent: amount of different habitat types at farm, catchment, national level

Map by Cian White

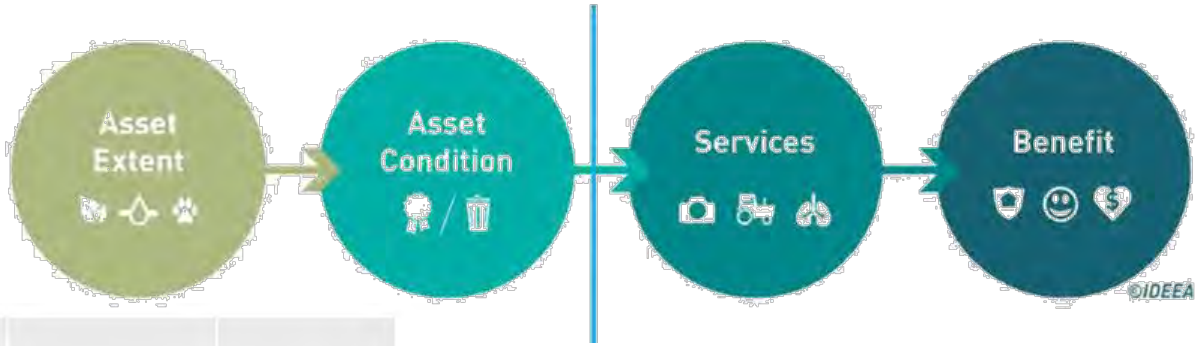
Grassy banks

Oak copse

Verges

Photos by Cian White

Natural Capital Accounting



FARM ECOS
Farming and Natural Resources: Measures for Ecological Sustainability

Condition: quality of different habitat types at farm, catchment, national level

Need indicators, quality scores

Poor condition

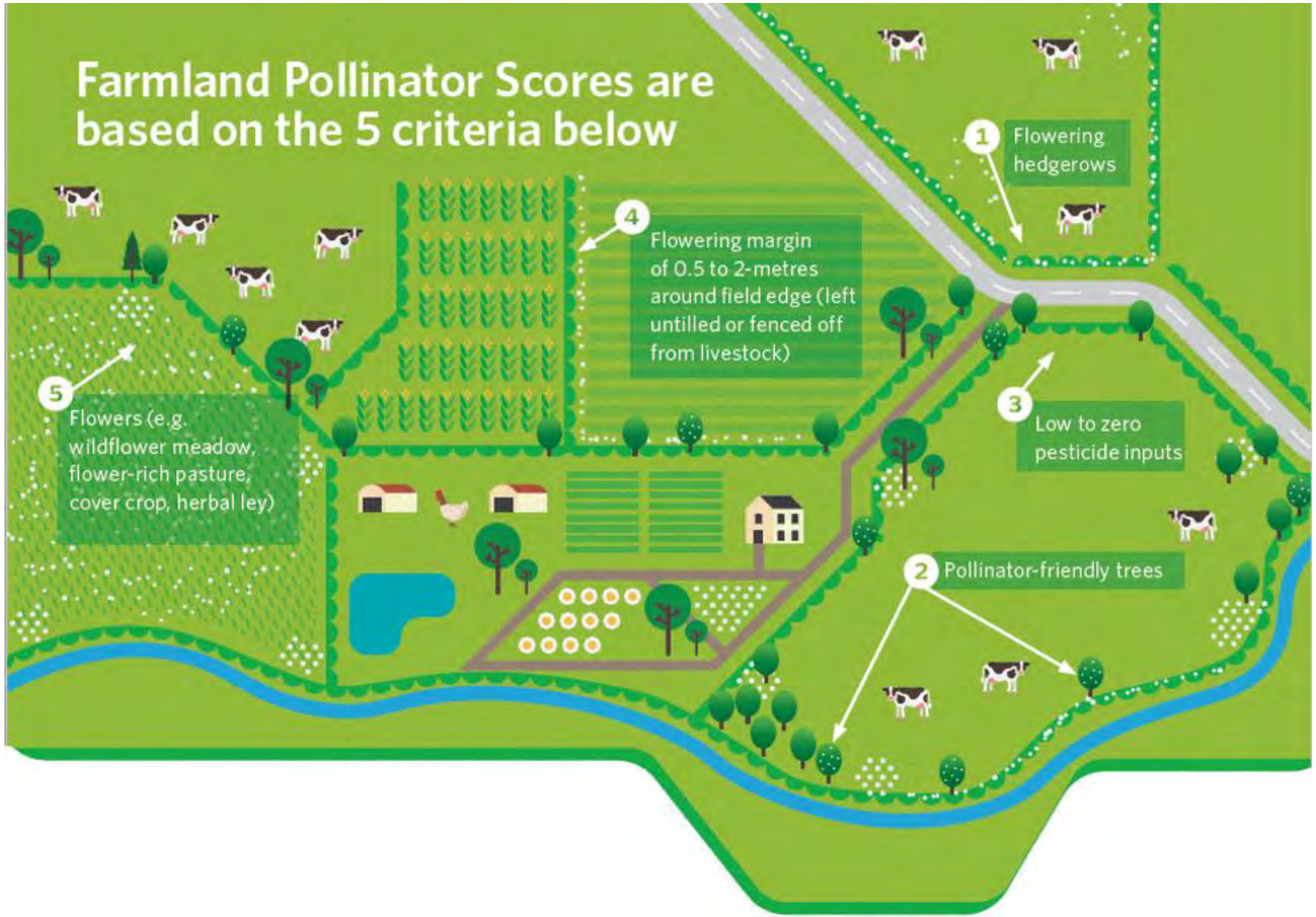
Good condition

Photos by Cian White

Protecting Farmland Pollinators

National Biodiversity Data Centre

Documenting Ireland's Wildlife



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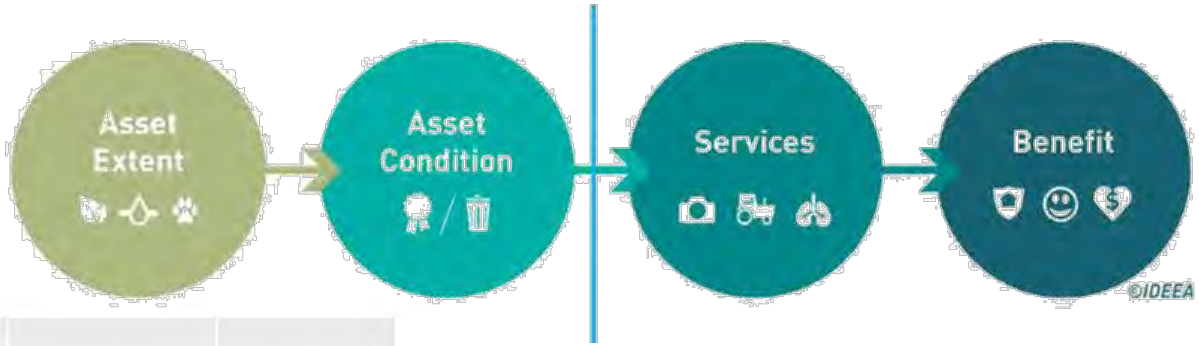
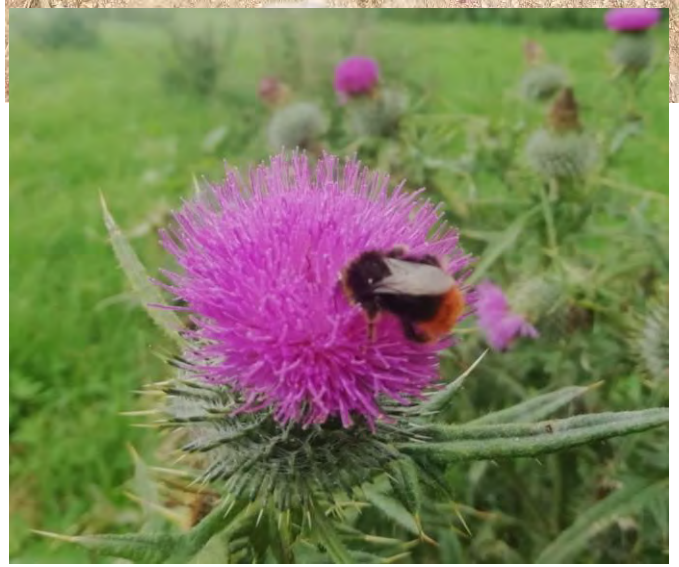


Benefits/services: ecosystem services delivered by different habitats individually and in combination

Need data on flows

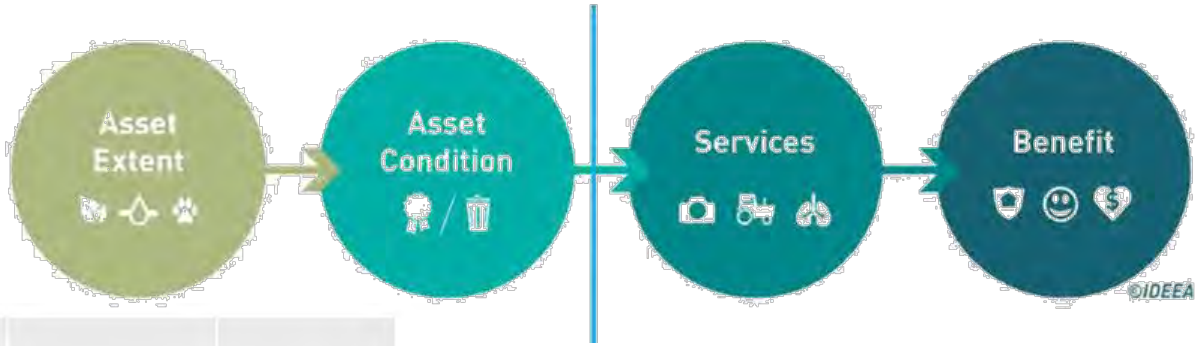


Amount of pollen transfer, predation of crop pests…

Number of bird species protected, reduction in wind speed, tonnes of C stored, number of people wild foraging…

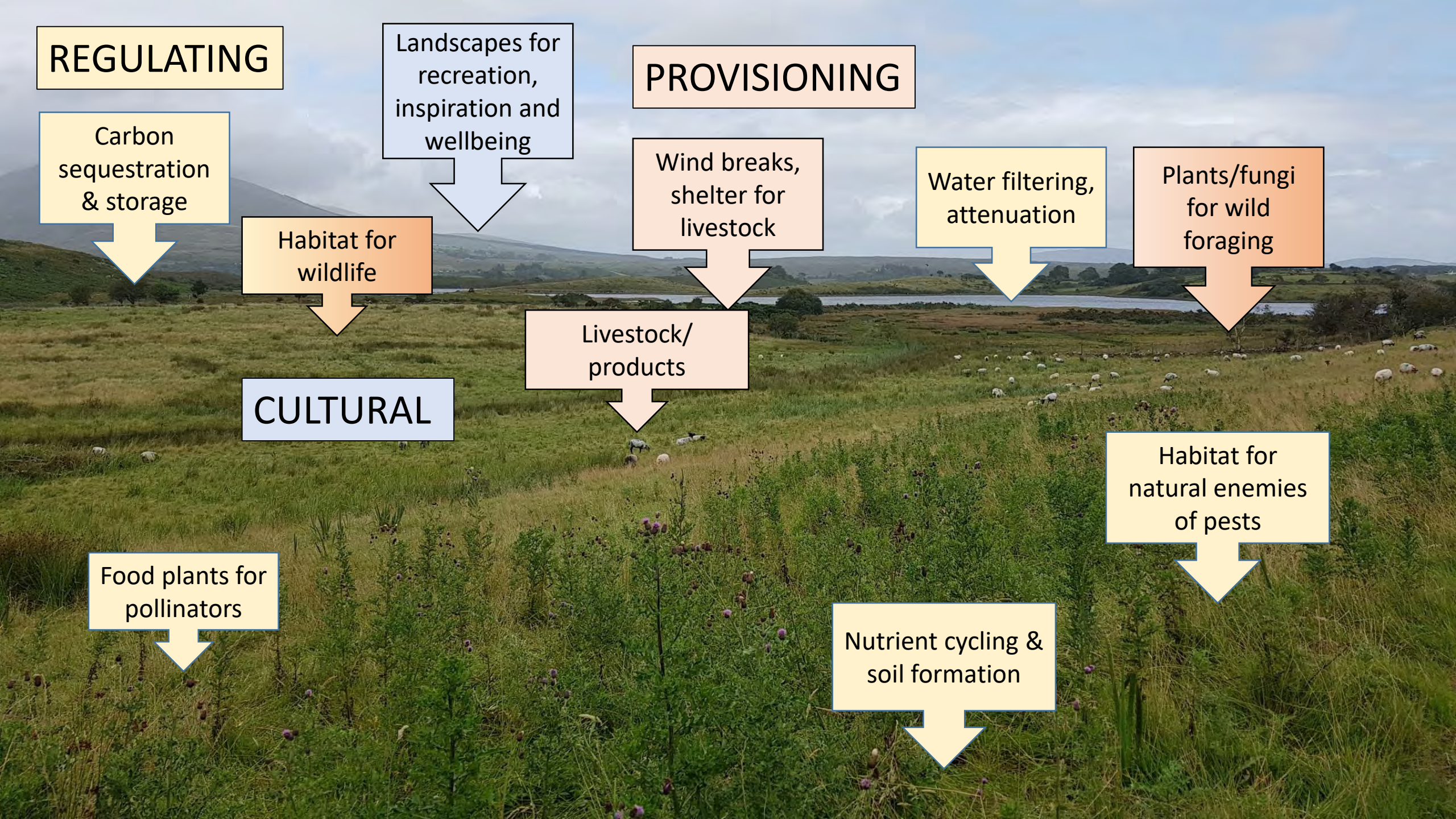
Volume of water attenuated, tonnes of C stored…

Natural Capital Accounting



Benefits: financial, proxies, non-market values…

Value to whom??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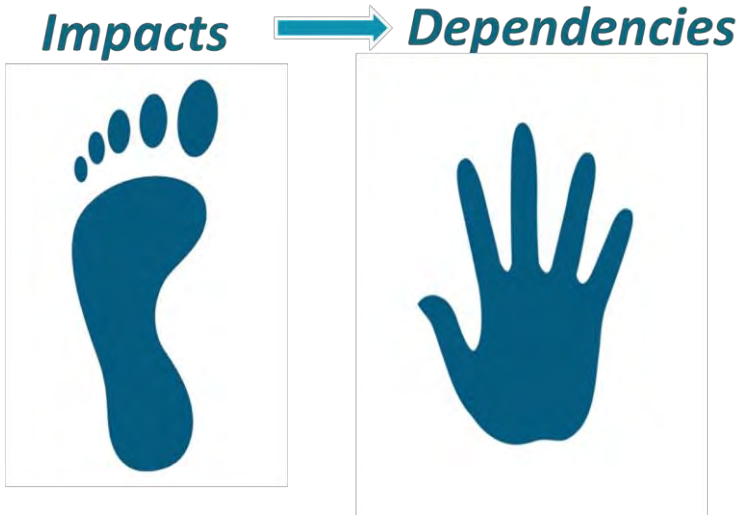
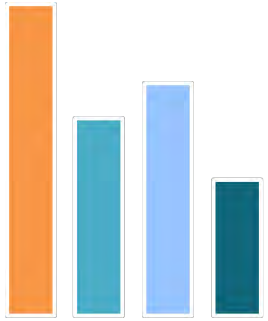
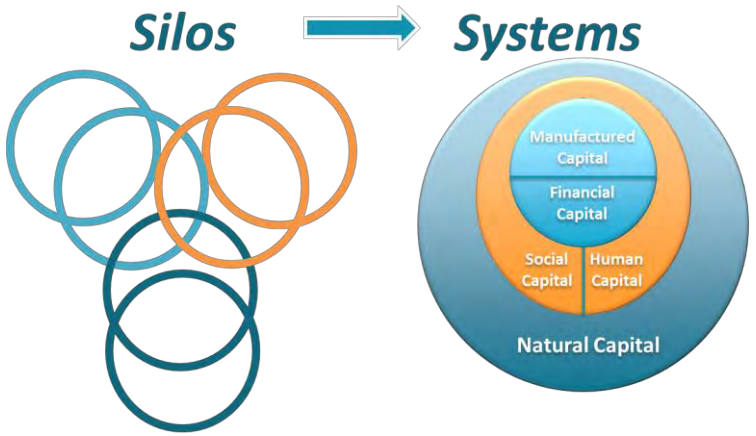
Natural Capital Accounting

https://youtu.be/ykzFmT4rhmM

Natural Capital Approach







Source: This Is Natural Capital 2017

- ✓ Recognise value of natural capital and our dependencies on it
- ✓ Data -> decisions
- ✓ From silos to systems

IRISH FORUM ON NATURAL CAPITAL

Summary

- ✓ Natural capital frames nature as an asset to be protected and invested in for the future
- ✓ We should measure, account for and allocate it with the same level of exactitude as for financial, built and human capitals
- ✓ Economic valuation can help, but there are other ways too
- ✓ Natural capital's true value is priceless
- ✓ But right now, priceless = worthless

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