

*Nature Based
Solutions:
Opportunities in
a time of
biodiversity
crisis and
climate
emergency;
April 27th 2021*



System of
Environmental
Economic
Accounting



Trinity
College
Dublin

The University of Dublin

INCASE
Irish Natural Capital Accounting for Sustainable Environments

The INCASE project: piloting Natural Capital Accounting at catchment scale in Ireland



Dr Catherine Farrell
MCIEEM
Research Fellow

This morning:

- What is natural capital +/- accounting and why does it matter?
- Overview of the SEEA-EA accounting framework
- What is INCASE?
- Outputs from INCASE: extent, condition, services, benefits
- What next?

What is Natural Capital?

Ecosystems, geosystems,
atmospheric systems

STOCKS

Ecosystem
services

FLOWS

Benefits to people



Natural Capital

1981 & 1983: First use of "ecosystem services" terminology by Ehrlich and Mooney

Brundtland
report 1987



IRC SCIENCE FOR POLICY REPORT

Key message:
This is a busy space with many
policy linkages

1997: "Nature's Services" published by Costanza et al. in Scientific American Daily.

2000-2004: Millennium Ecosystem Assessment published by Costanza et al.

2006: Launch of the TEEB (The Economics of Biodiversity)

2009: The Common International System of Ecosystem Services (CISES) launched

2010: Wealth Accounting and Ecosystem Services (2010) launched

2012: The journal Ecosystem Services launched

2012: Natural Capital Declaration at Rio+20 Summit

2013: Inaugural World Forum on Natural Capital

2014: UN System of environmental-economic accounting (SEEA) finalised

2015: UN Agenda 2030 launched including target 15.9 - ecological accounting.

2015: Draft Natural Capital Protocol launched

2017: 3rd World Forum on Natural Capital

2019: The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) global assessment published

2014: Irish Forum on Natural Capital launched

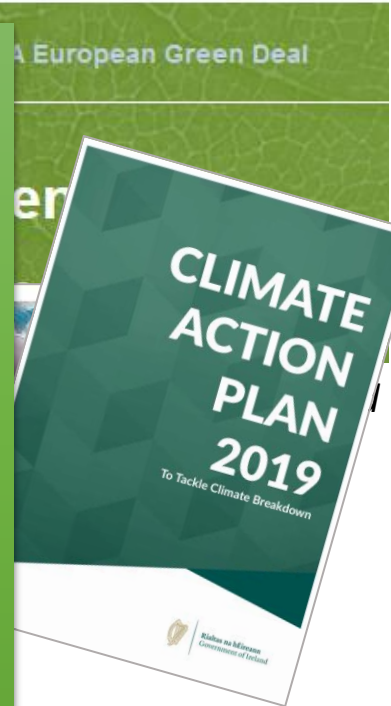
2016: Irish MAES Pilot 2016 (Mapping ecosystem services and Habitat Asset Register)

2019 Q1: INCASE commenced

2019 Q4: **European Green Deal** announced

2020: CSO establish Ecosystem Accounts unit

2021: SEEA-EA adopted as a statistical standard; **EU Biodiversity Strategy 2030**



assess ecosystems)

**Economists realising:
Nature has limits**

**The economy sits within nature
We are living beyond our limits
(hence crises!)**

Figure 4.11 Th

G(S)

ly
a

<https://cleem.net/dasgupta-review-of-the-economics-of-biodiversity-published/>



System of
Environmental
Economic
Accounting

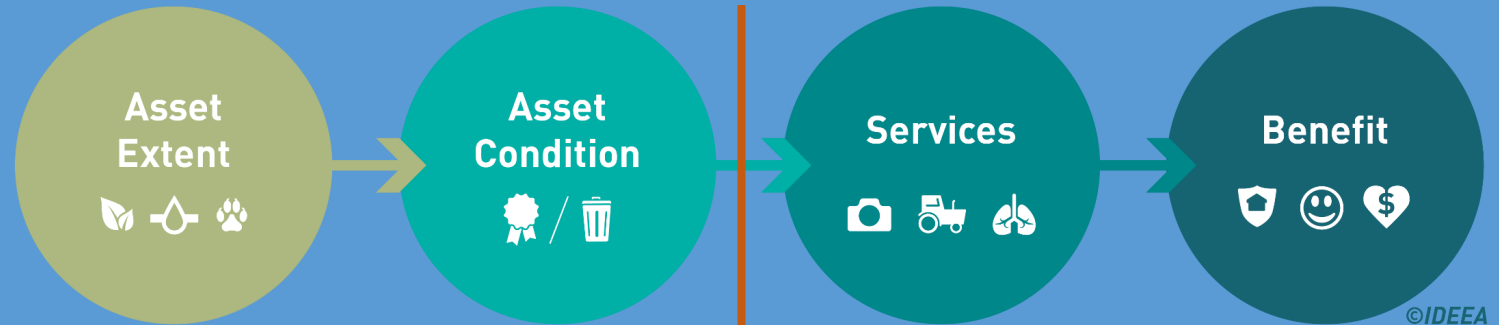
An Introduction to Ecosystem Accounting

Key Concepts and
Policy Applications

seea@un.org | seea.un.org



System of
Environmental
Economic
Accounting



Stocks:

forests, wetlands,
rivers, seagrass
beds, reefs,
subsoils,
groundwater

Flows:

timber, fish, carbon, water,
habitat, recreation,
amenity, **aggregates,**
geo-forms

INCASE

Irish Natural Capital Accounting for Sustainable Environments

<https://www.incaseproject.com/>
@IncaseProject



Jane Stout



Catherine Farrell



Trinity
College
Dublin

The University of Dublin



Mary Kelly-Quinn



Lisa Coleman



Stephen Kinsella



Daniel Norton



UNIVERSITY of LIMERICK
OLLSCOIL LUIMNIGH



Cathal O'Donoghue



OÉ Gaillimh
NUI Galway



Orlaith Delargy



Fiona Smith



NATURAL
CAPITAL
IRELAND



Carl Obst



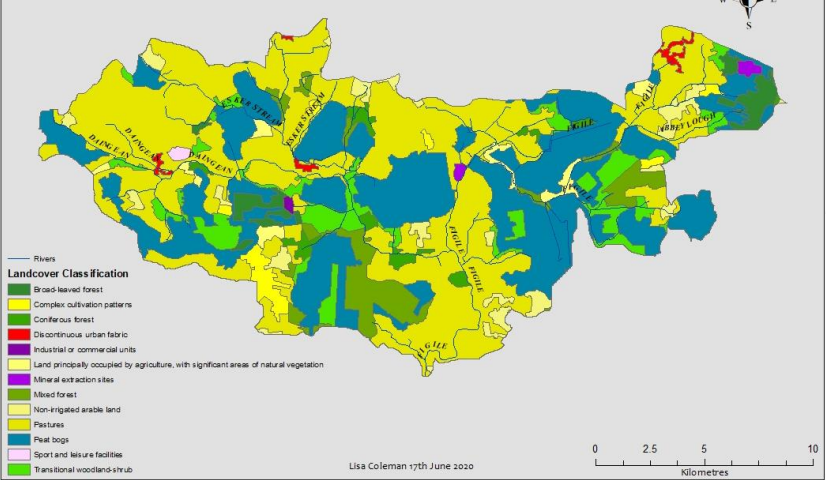
Mark Eigenraam



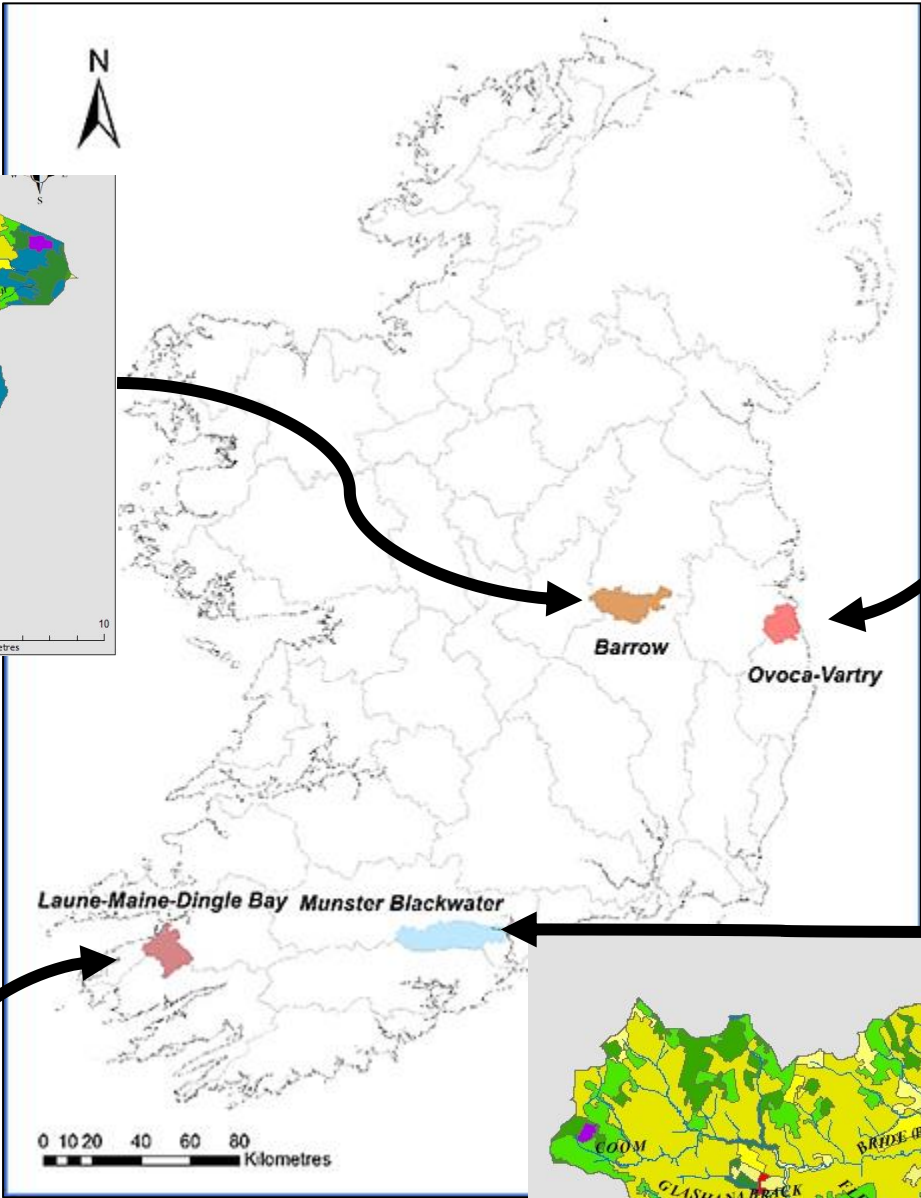
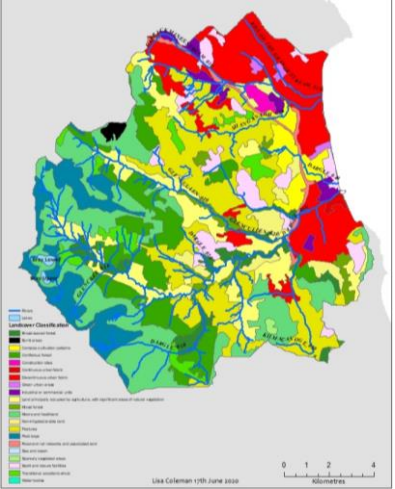
IDEEA Group
Institute for Development of Environmental Economics and Statistics

INCASE
Irish Natural Capital Accounting for Sustainable Environments

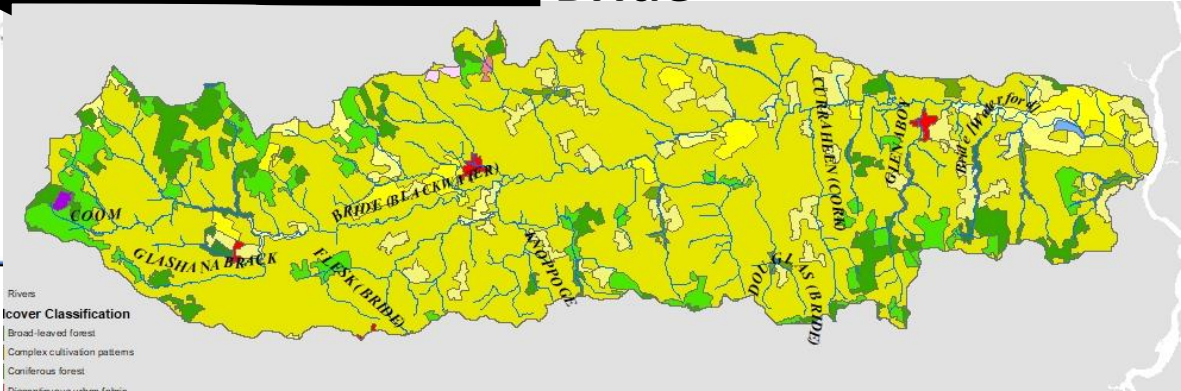
Figile



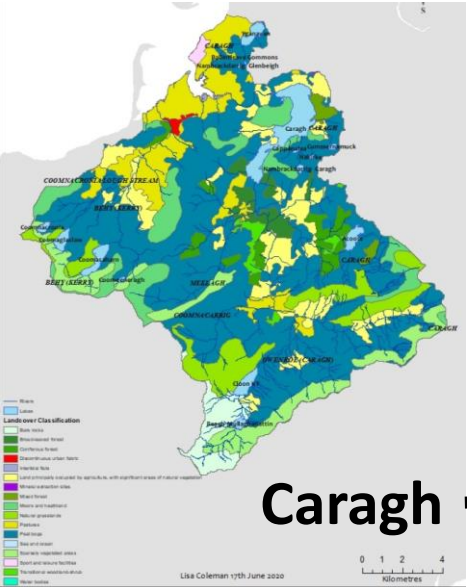
Dargle



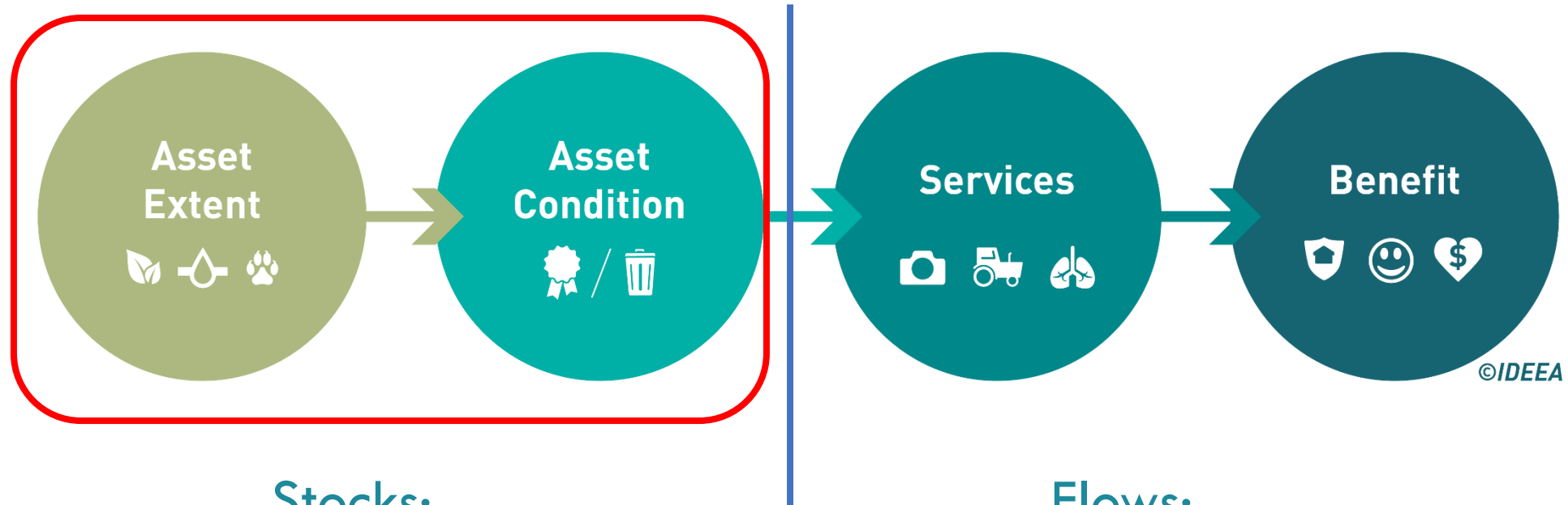
Bride



Caragh



SEEA-EA: EXTENT AND CONDITION



Stocks:

forests, wetlands,
rivers, seagrass
beds, reefs,
subsoils,
groundwater

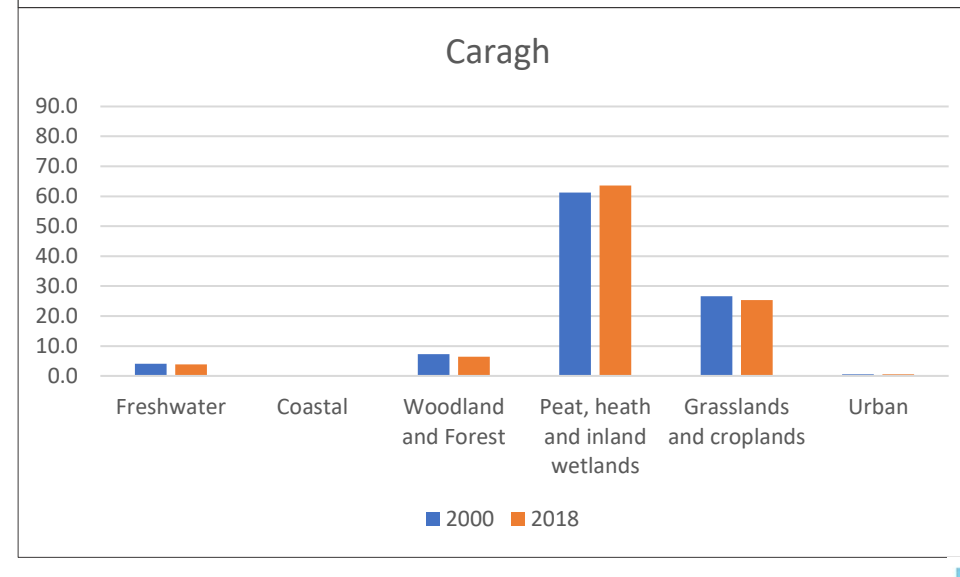
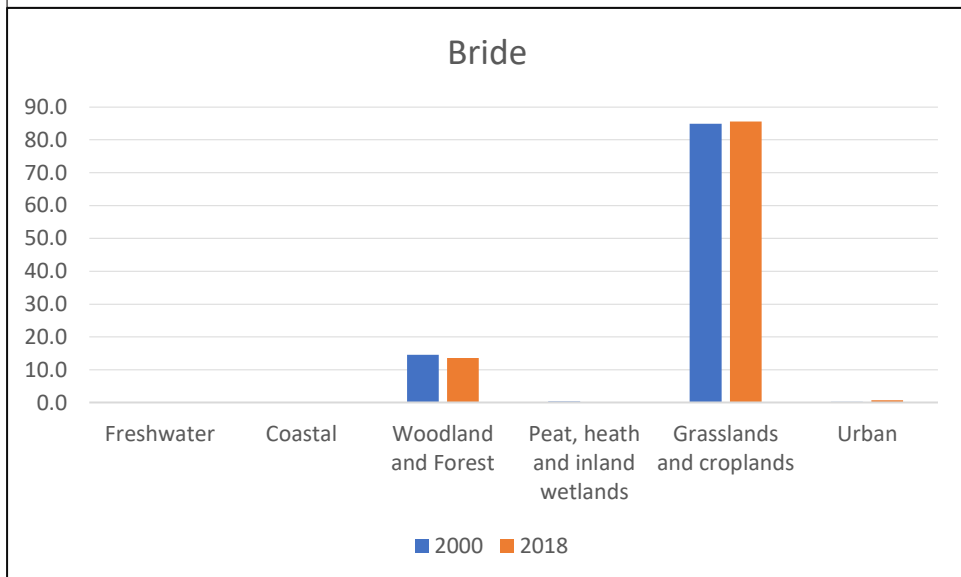
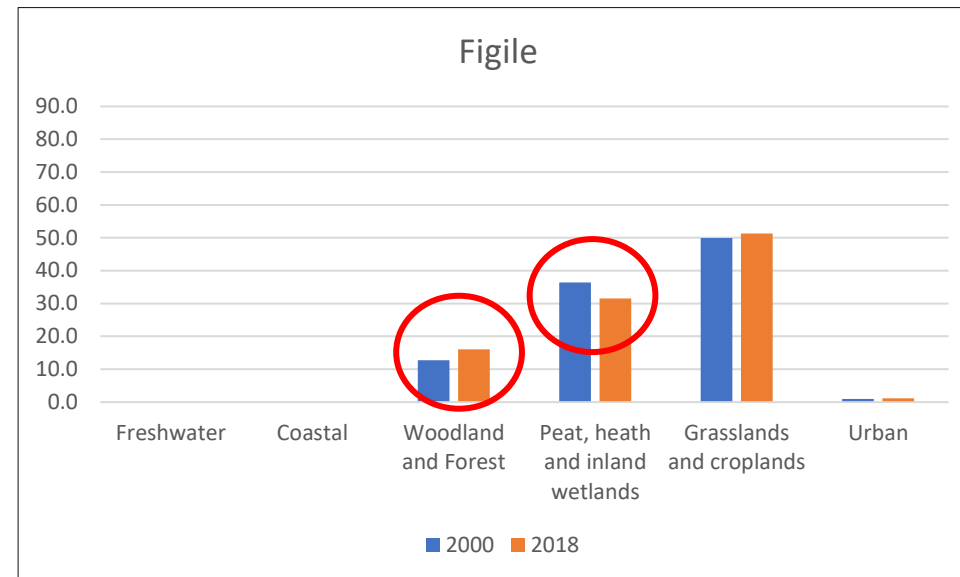
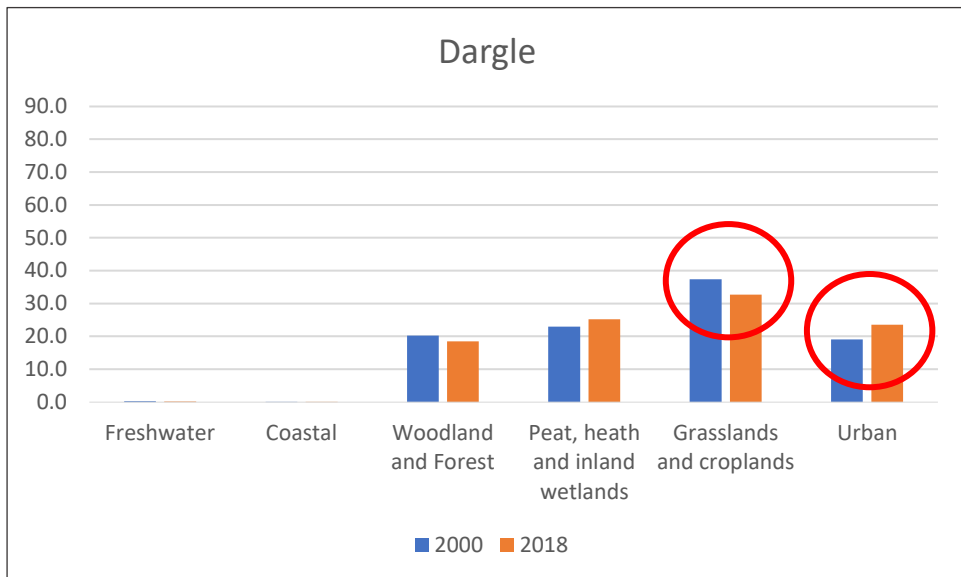
Flows:

timber, fish, carbon, water,
habitat, recreation,
amenity, **aggregates,**
geo-forms

Extent accounts: standardised, reliable, time series data

| General ecosystem type 2018 | % cover | | | | CORINE land cover description CLC Level 3 |
|-----------------------------|---------|--------|-------|--------|--|
| | Dargle | Figile | Bride | Caragh | |
| Freshwater | <1 | <1 | <1 | 4 | Water bodies |
| Woodland and Forest | 18 | 16 | 14 | 7 | Coniferous, Broad-leaved; Mixed Forest and Scrub |
| Peatlands and Heathlands | 25 | 32 | <1 | 64 | Moors and Heathland; Peat Bogs; Inland marshes |
| Urban / Built | 24 | 1 | <1 | <1 | Urban fabric; Infrastructure; |
| Grassland and Cropland | 33 | 51 | 86 | 25 | Pastures; Agricultural; Arable |
| Coastal | <1 | 0 | <1 | <1 | Coastal wetlands and lagoons |

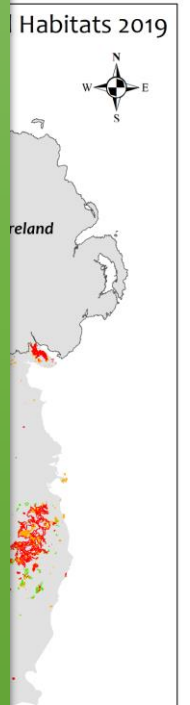
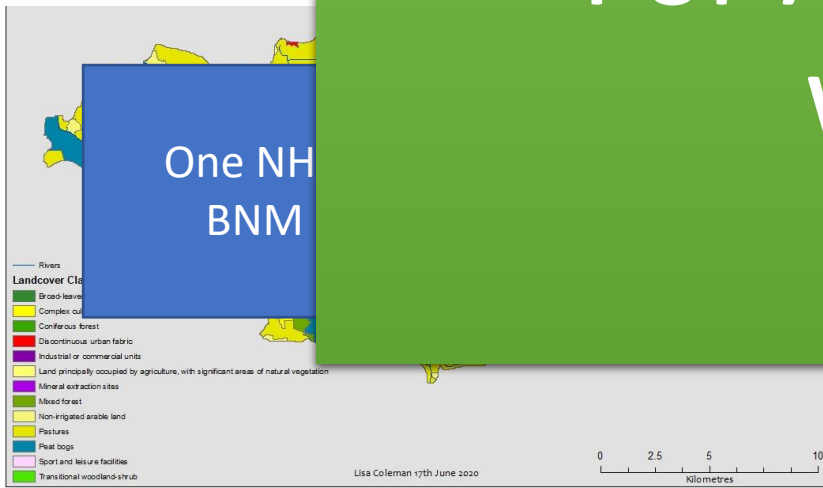
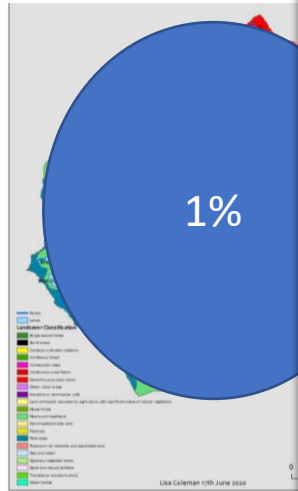
Extent (% cover): changes over time (2000 to 2018)



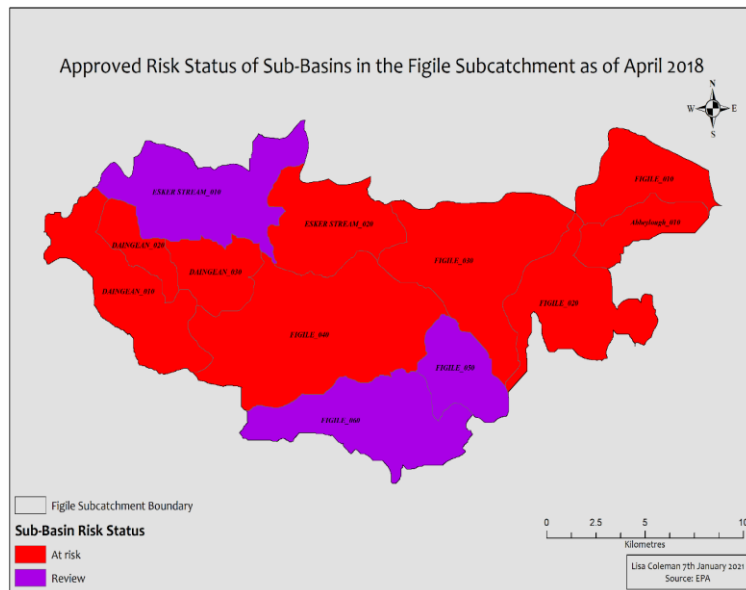
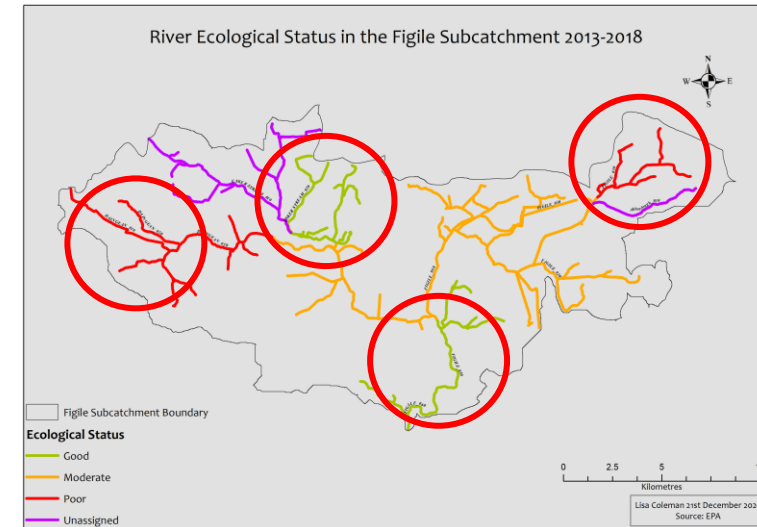
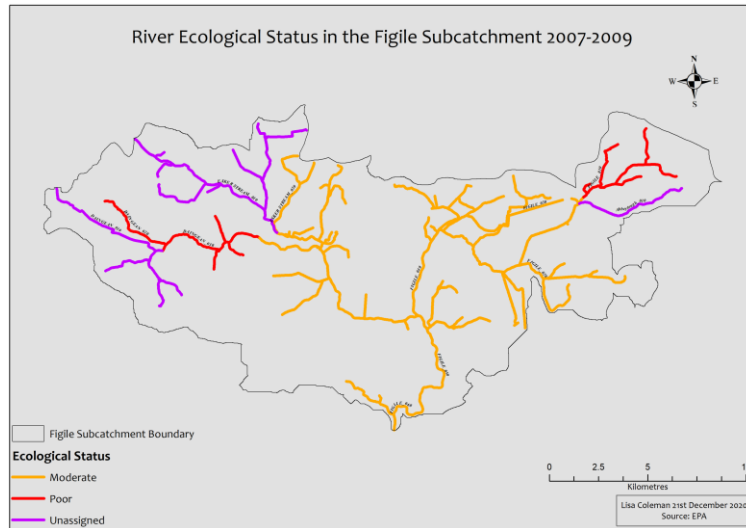
What about condition?

Key message:

What reference condition (when)?
For ALL ecosystem types?
What attributes?



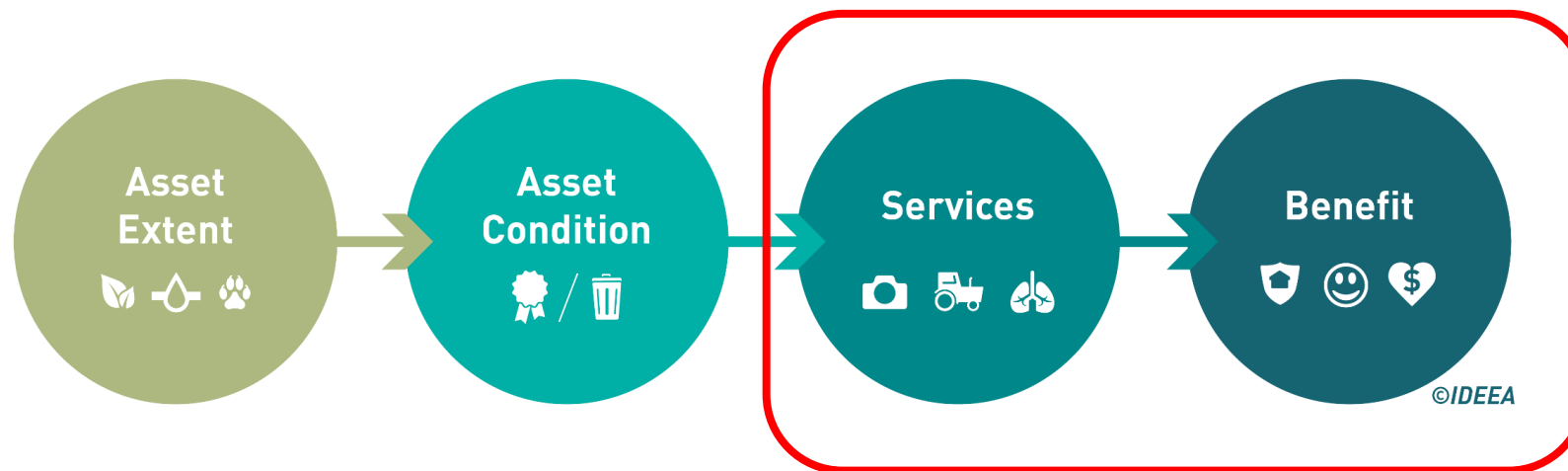
Condition: changes in ecological status of rivers over time (2010 to 2018)



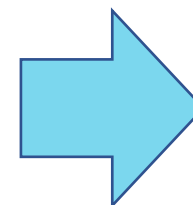
Extent and Condition: reliable, time series data
Extent: landcover (is that good enough for now?)
Condition: WFD (to sub basin) and Habitats Directive (national level)

'Condition: The missing link to sustainable use'

SEEA-EA: ECOSYSTEM SERVICES & BENEFITS



| Ecosystem Services | Examples |
|-------------------------------------|--|
| Provisioning Services | Food, Timber, Drinking Water |
| Regulating and Maintenance Services | Carbon Sequestration, Water purification and regulation of flows; Habitat (nursery)provision |
| Cultural Services | Recreation, Ecosystem appreciation (and, and, and...) |



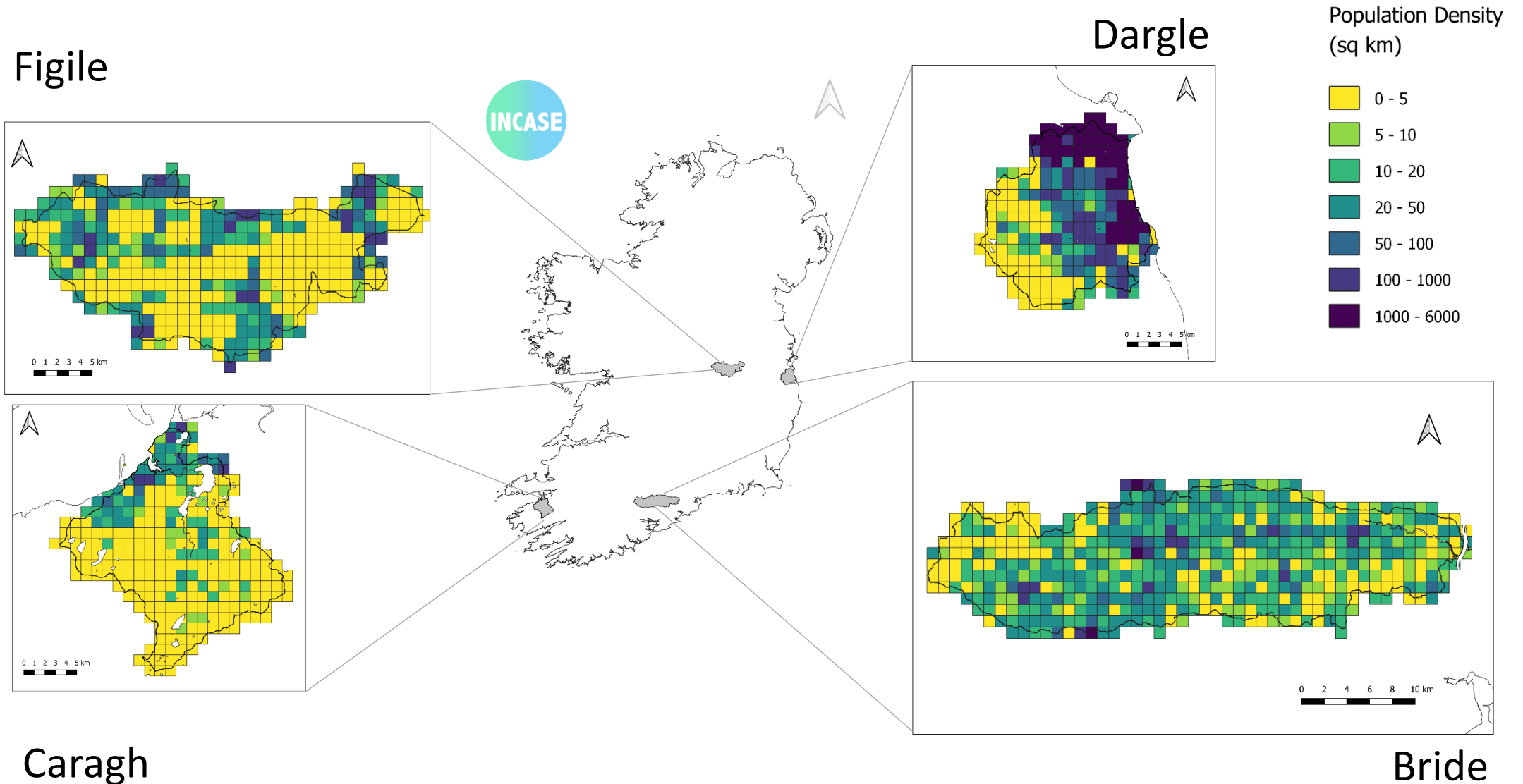
Three Questions

Where are people?

What are they doing?

Who could lose out?

INCASE CATCHMENTS: POPULATION DENSITY



STOCK ACCOUNTS

(& change in stocks)

1

Ecosystem
extent

2

Ecosystem
condition

5

Ecosystem
asset account
(stocks &
change in stock)

FLOW ACCOUNTS

3

Ecosystem
service
(flow & use)

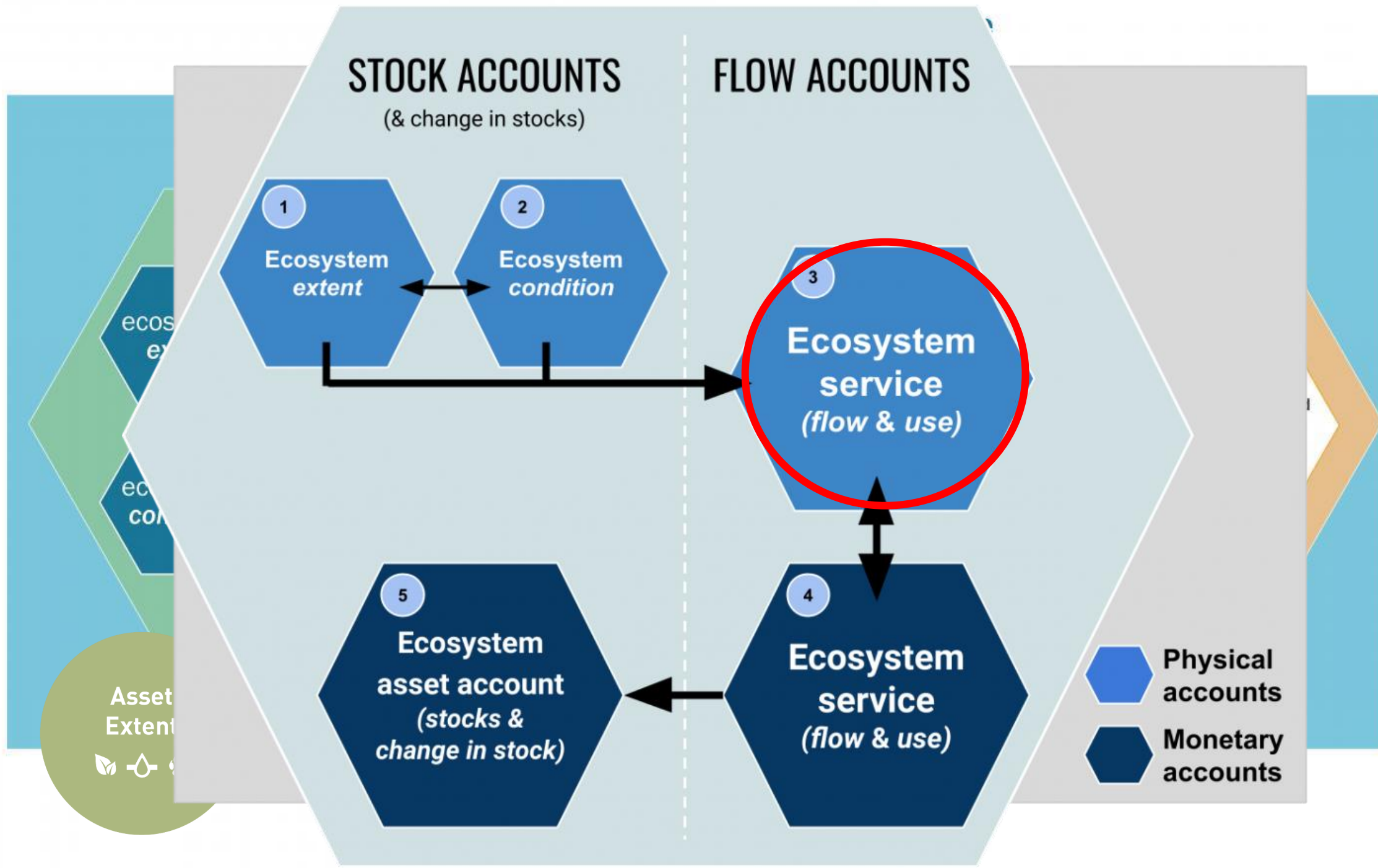
4

Ecosystem
service
(flow & use)

Physical
accounts

Monetary
accounts

Asset
Extent



SUPPLY ACCOUNT: WHO / WHAT ECOSYSTEM USES WHAT SERVICE?

| Selected economic units | | | | | | | | | | INCASE working classification (CORINE / other data merged) | | | | | | | | | | Total USE resident ecosystem assets | Exports - ecosystem services | Total USE ecosystem services | TOTAL USE | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|-----------|--|--|------------|--|--|--|-------------------------------------|------------------------------|------------------------------|-----------|--------------------|--|--------------------|--------------|
| Economic sectors / beneficiaries | | | | | | | | | | Terrestrial | | | | | | | | | | | | | | Freshwater | | Geosystem | |
| | | | | | | | | | | Woodlands and Forest | | | Peatlands | | | Heathlands | | | | | | | | Saline | | | Water-bodies |
| Selected ecosystem services (reference list) | | | | | | | | | | ECOSYSTEM TYPES | | | | | | | | | | Mineral aggregates | | Mineral aggregates | | Mineral aggregates | | Mineral aggregates | |
| Provisioning services | | | | | | | | | | Terrestrial | | | | | | | | | | Freshwater | | Geosystem | | Geosystem | | Geosystem | |
| Biomass provisioning | | | | | | | | | | Woodlands and Forest | | | | | | | | | | Water-bodies | | Water-bodies | | Water-bodies | | Water-bodies | |
| Crop | | | | | | | | | | Peatlands | | | | | | | | | | Coastal | | Coastal | | Coastal | | Coastal | |
| Grazed biomass | | | | | | | | | | Heathlands | | | | | | | | | | Saline | | Saline | | Saline | | Saline | |
| Timber | | | | | | | | | | Terrestrial | | | | | | | | | | Freshwater | | Freshwater | | Freshwater | | Freshwater | |
| Water supply | | | | | | | | | | Woodlands and Forest | | | | | | | | | | Water-bodies | | Water-bodies | | Water-bodies | | Water-bodies | |
| Other provisioning services | | | | | | | | | | Peatlands | | | | | | | | | | Coastal | | Coastal | | Coastal | | Coastal | |
| Regulating and maintenance services | | | | | | | | | | Heathlands | | | | | | | | | | Saline | | Saline | | Saline | | Saline | |
| Global climate regulation services | | | | | | | | | | Terrestrial | | | | | | | | | | Freshwater | | Freshwater | | Freshwater | | Freshwater | |
| Water purification services | | | | | | | | | | Woodlands and Forest | | | | | | | | | | Water-bodies | | Water-bodies | | Water-bodies | | Water-bodies | |
| Water flow regulation services | | | | | | | | | | Peatlands | | | | | | | | | | Coastal | | Coastal | | Coastal | | Coastal | |
| Nursery population & habitat maintenance services | | | | | | | | | | Heathlands | | | | | | | | | | Saline | | Saline | | Saline | | Saline | |
| Other regulating and maintenance services | | | | | | | | | | Terrestrial | | | | | | | | | | Freshwater | | Freshwater | | Freshwater | | Freshwater | |
| Cultural services | | | | | | | | | | Woodlands and Forest | | | | | | | | | | Water-bodies | | Water-bodies | | Water-bodies | | Water-bodies | |
| Recreation-related services | | | | | | | | | | Peatlands | | | | | | | | | | Coastal | | Coastal | | Coastal | | Coastal | |
| Ecosystem and species appreciation services | | | | | | | | | | Heathlands | | | | | | | | | | Saline | | Saline | | Saline | | Saline | |
| Other cultural services | | | | | | | | | | Terrestrial | | | | | | | | | | Freshwater | | Freshwater | | Freshwater | | Freshwater | |

Key message:

Work in progress

(ask us in 2022!)

SEEA-EA: A WORD ON DATA



Key message:
Data 4 Nature workshop
May 11th 2021



SUSTAINABLE UPLANDS
AGRI-ENVIRONMENT SCHEME



Next steps

- Build accounts across **4 catchment areas**
- **Workshops** in June 2021 – all welcome
- **Data 4 Nature** conference May 11th 2021
- **Gaps:** ecosystem map, condition data, ecosystem services (regulating and cultural gaps)
- **Wish list:** if we are to respond to the increasing policy asks in a coherent and effective way, we need a National ecosystem map and eco/geosystem assessment to bring ecological (and geosystem) community together to inform best approach to NCA.



Natural capital investment
important for green
recovery EPA 2020

*“All EU policies should contribute to
preserving and restoring Europe’s natural
capital”* European Commission 2019

Thanks for listening and thanks for working with us!

- <https://www.incaseproject.com/> newsletter, videos, blogs, papers; workshops June 2021
- <https://www.naturalcapitalireland.com/> FAQs, join!, workshops, videos, discussion and policy groups
- <https://maiaportal.eu/> EU H2020 project with really great information on different sets of accounts / valuations etc.
- <https://seea.un.org/content/latest-news> overview of global engagement and work on SEEA-EA
- <https://capitalscoalition.org/> social, economic and natural capitals engagement platform for business
- DATA4NATURE event 2021 register:
<https://www.eventbrite.com/e/natural-capital-ireland-data-4-nature-workshop-tickets-146615437721?aff=ebdsoporgprofile>