



Swindon & Wiltshire
LOCAL ENTERPRISE PARTNERSHIP



UNIVERSITY OF
BATH

Natural Capital:

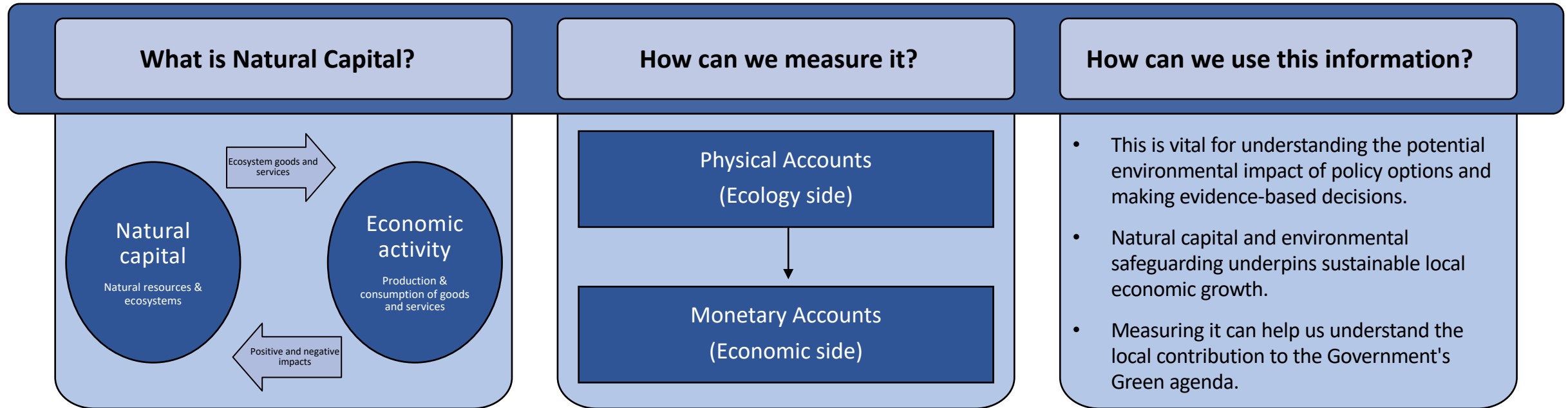
Specifying the Value of Nature

SWLEP Board

26th January 2023

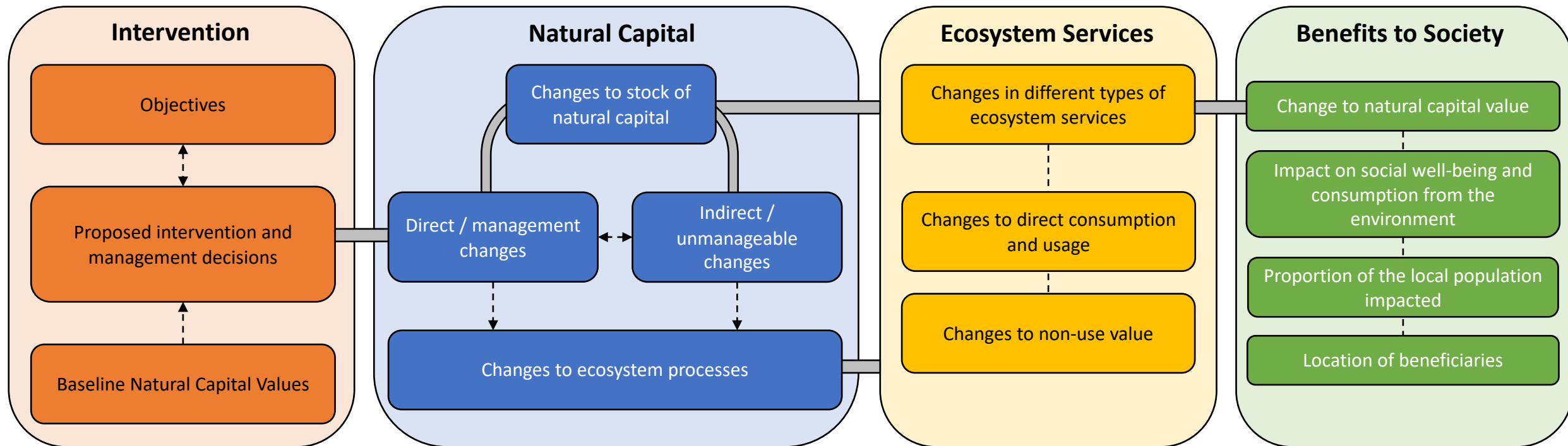
Parsa Mohammadpour

Overview and recap



Recap of the framework

- The decision-making framework aims to measure, understand, and value the relationship which local decision making has directly and indirectly with the stock of natural capital.
- Understanding this relationship is vital to bringing in the value of nature (with the risk and opportunities) into making more informed decisions, interventions and management choices.



Management decisions and spatial scale

- We want to have a framework which can be adaptable for different types of management decisions and spatial scale (diagram on the left) for which we need to understand the value and make up of natural capital at the most granular level (permitted to data availability), which can then be aggregated up based on needs and application.

Underlying Framework

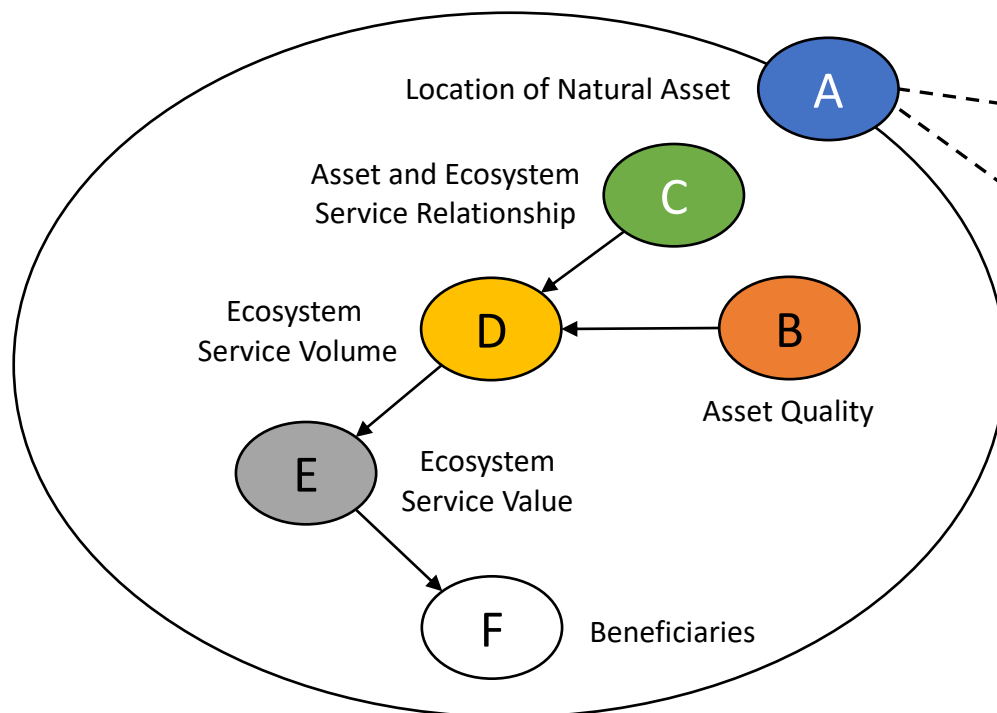
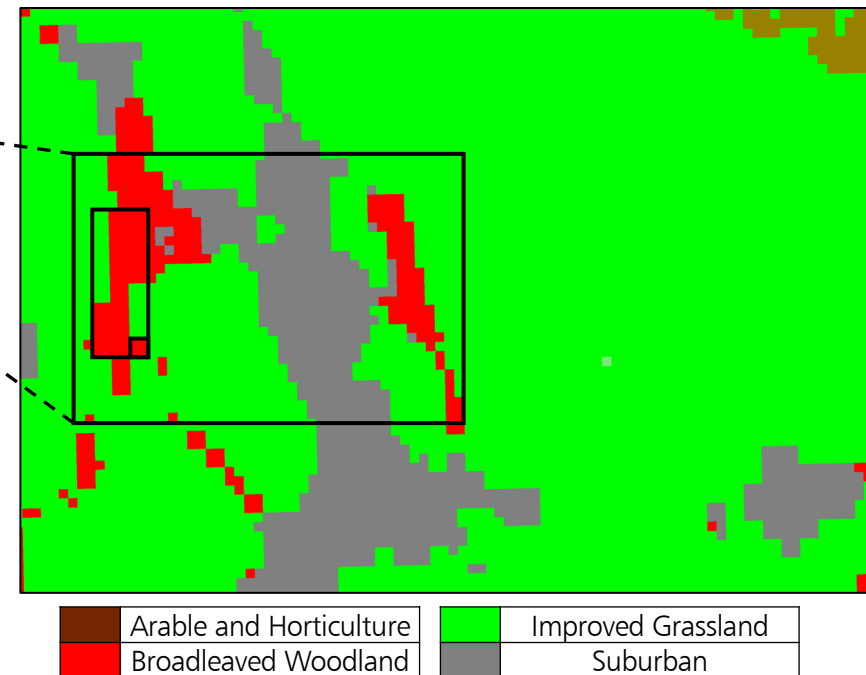
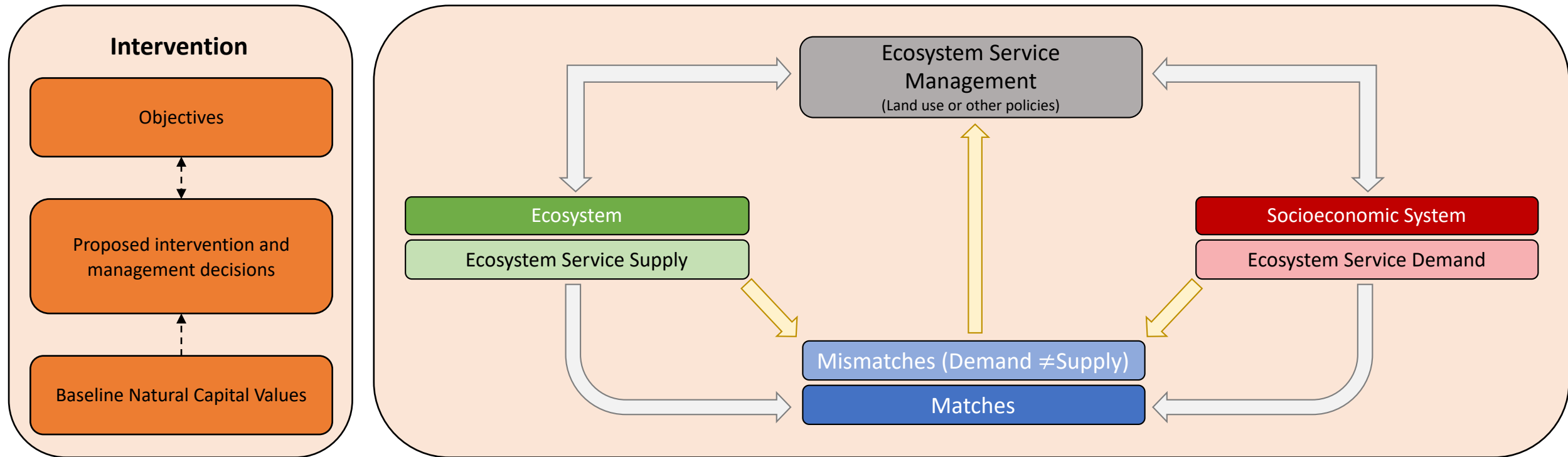


Illustration of Scale for Applying the Framework



Supply, demand and management of ecosystem services

- When considering an intervention or management decision related to natural capital, its key to understand the supply and demand of ecosystem services. This is important in the context of local decisions, where understanding an imbalance between supply and demand could lead to more targeted interventions.

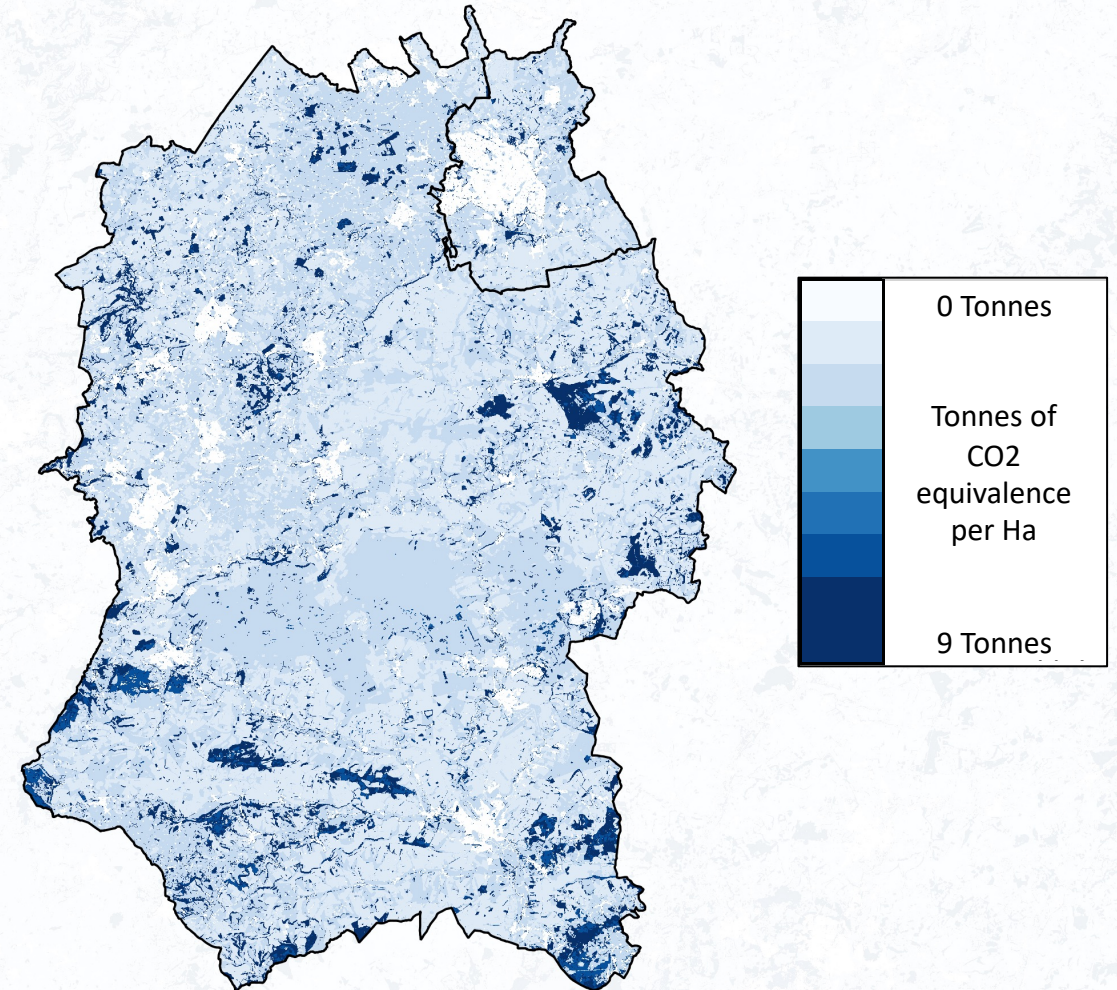


Framework from on Wei et al (2017)

Example one – Supply of ecosystem services

- When we mention supply of ecosystem services, this is referring to the amount of a given service being generated by our environmental assets.
- All assets supply a different bundle of services. In the example used of carbon storage, environment assets such as woodland, grassland and freshwater all generate and contribute to the supply (to different extents).
- The map (right hand side) shows supply of carbon storage across the Swindon and Wiltshire area. The index used for the map shows that upper end (darkest blue) equals to around 8-9 tonnes of CO2 equivalence storage per ha of land.

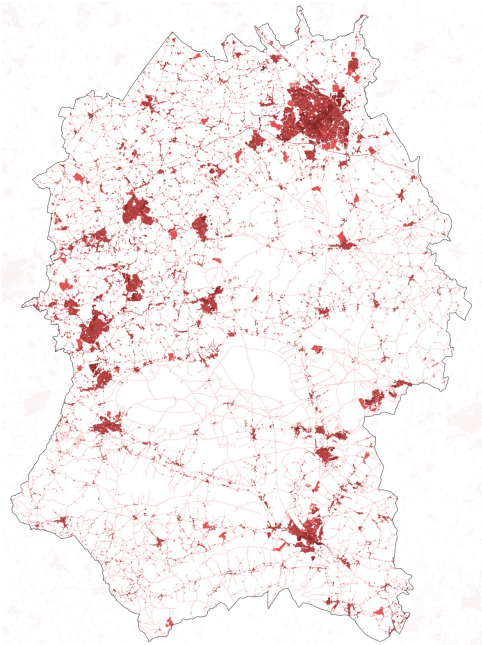
Carbon Storage



Example two – Supply and demand of ecosystem services

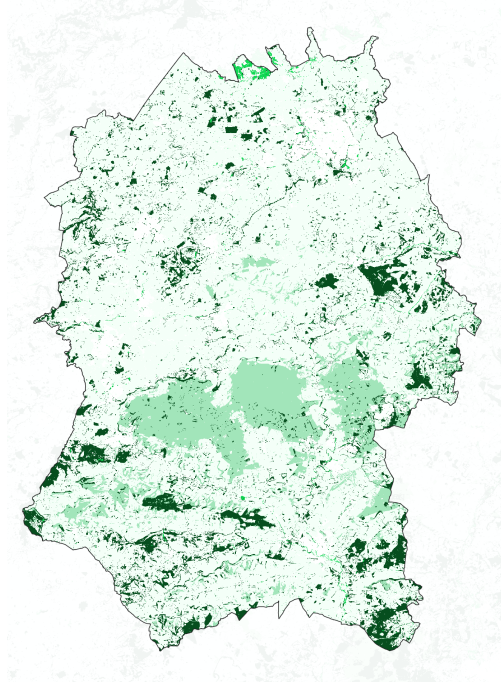
- The demand of an ecosystem service reflects the current consumption or use, over a given time. In our example, demand of temperature regulation is reflected by a 'need for risk reduction'. This reflects the demand from areas which might be exposed or vulnerable to the impacts of temperature increases (i.e. highly populated areas).

**Temperature Regulation
Demand**



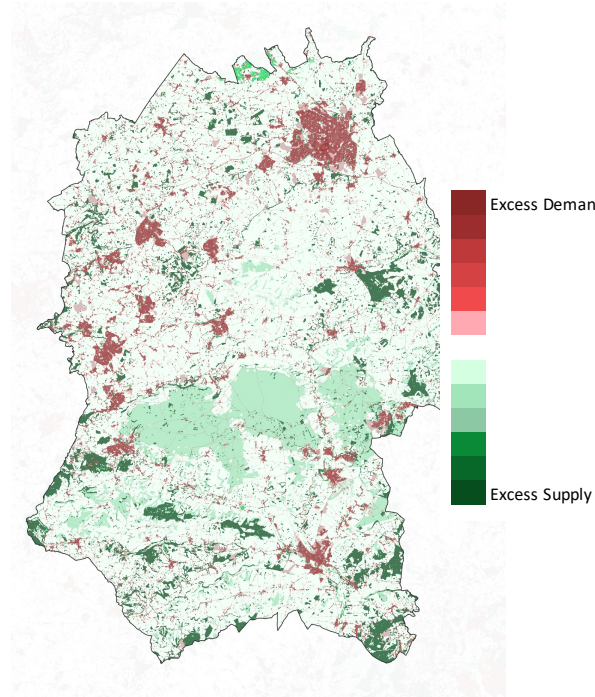
Need for risk reduction
(Dark areas reflect higher risk of temperature impacts and greater value demanded of ES)

**Temperature Regulation
Supply**



Reduction in °C

**Temperature Regulation
Flow**

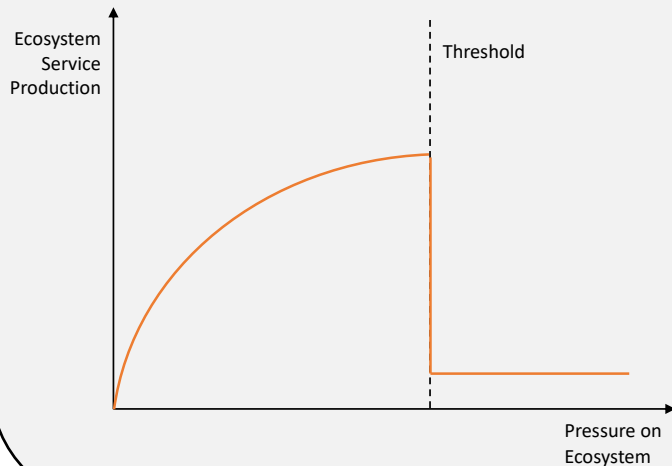


- For the flow diagram (far right-hand side) we see the area where the demand and supply overlap.
- An excess demand (dark red) shows where the current consumption or use need is beyond the level of current ecosystem supply.
- While an excess supply (dark green) shows that the demand is completely met, with left over ecosystem service not being utilised.

Why is asset quality important?

- Consideration for the quality of natural asset is also a vital part of management. Quality and quantity form an equal part to the underlying value of natural capital asset. The condition of natural capital assets impacts their ability to maintain the level of services in the future.

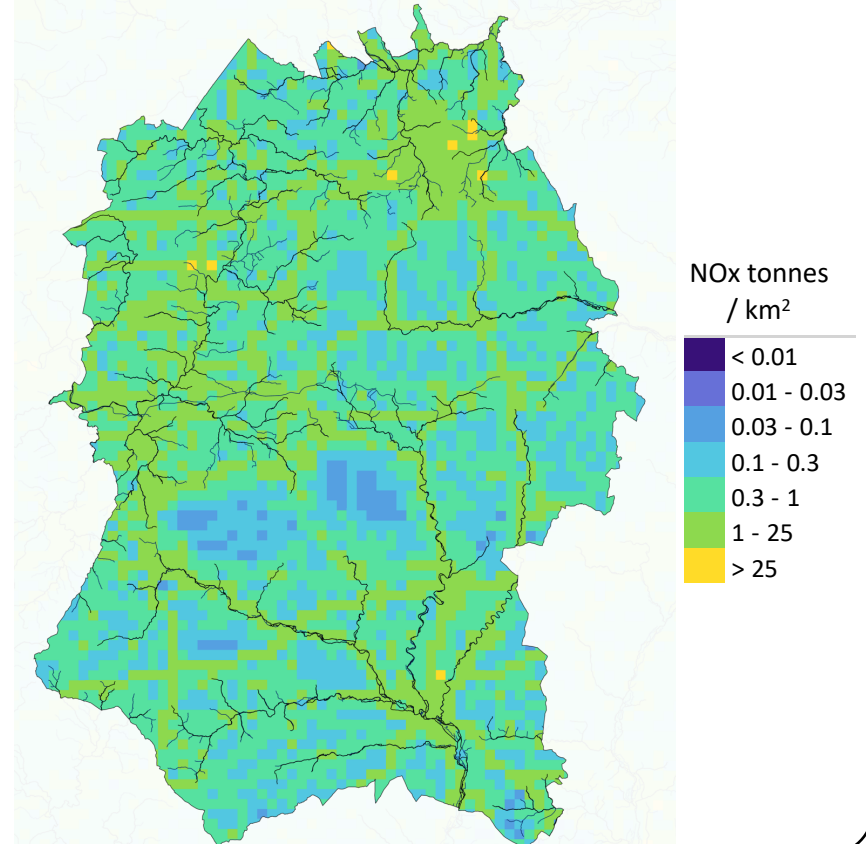
A tipping point is a level where ecological function of an ecosystem changes, where there is a large permanent (typically negative) change in the state of natural capital.



Nitrogen oxide is vital indicator towards understanding water quality (where a higher level typically correlates with lower water quality). Using the map (right hand side) we can start to understand where regional this might impact.

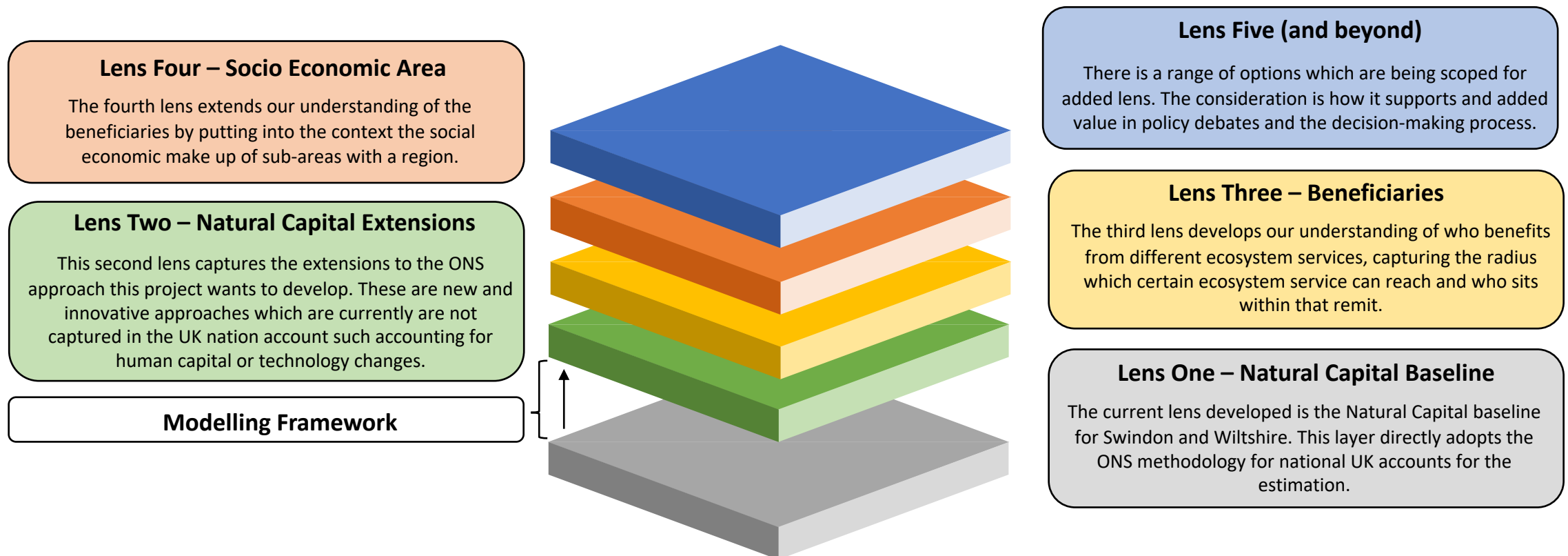
Using similar indicators for other assets, for our next steps we are understanding the impacts of environment condition on natural capital and the potential impact of ecosystem service being delivered.

Regional Open Water Sources and Nitrogen Oxide



Next steps

The modelling framework set the analytical foundation of the project to build on. The next steps will involve applying the model approach to the data and evidence we have. The outputs should be able to display the evidence related to natural capital in different lens to show different aspects and factors to support the policy decision making process. The below is an illustration of how the lens will show different pieces of information:



Update on PhD project milestones and timelines

Milestones and timelines relating to developing the Natural Capital baseline time series for SWLEP can be seen in **Yellow section**, the **Green section** relates to the conceptual Framework of how Natural Capital can inform local decision making.

