CORPORATES: Cooperative **Participatory** Evaluation of Renewable Technologies on Ecosystem Services

www.corporatesproject.co.uk

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NERC Knowledge Exchange (KE)

Biodiversity & **E**cosystem **S**ervice **S**ustainability (BESS)

The times they are a changing……

NERC SCIENCE OF THE ENVIRONMENT

GOAL of CORPORATES

To introduce **Ecosystem Services** and to design, with Stakeholders, methods (**a decision-support framework**) which address potential **ecological trade-offs** such as, climate change, marine renewable developments and MPAs

Series of 2 Workshops with Stakeholders

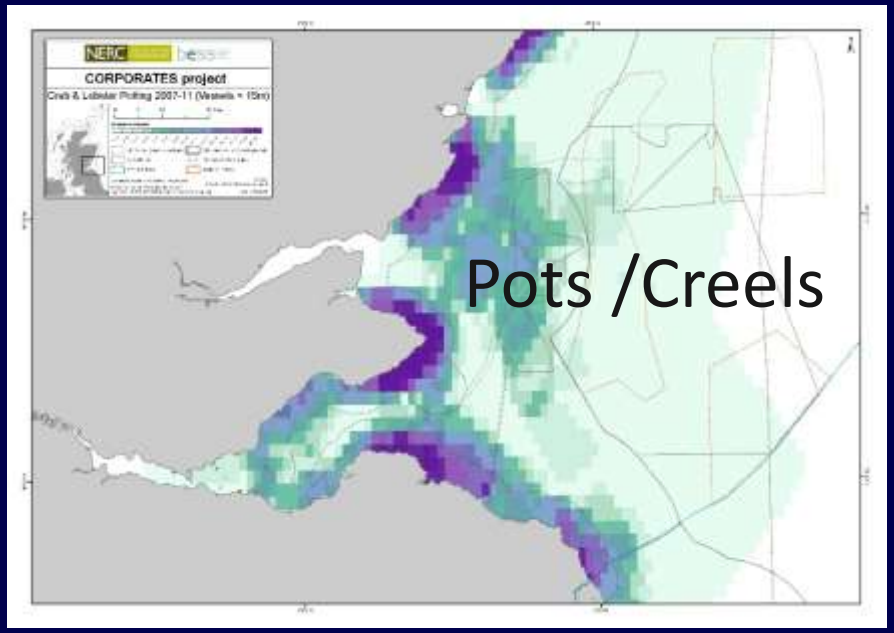
Participation- not just consultation.

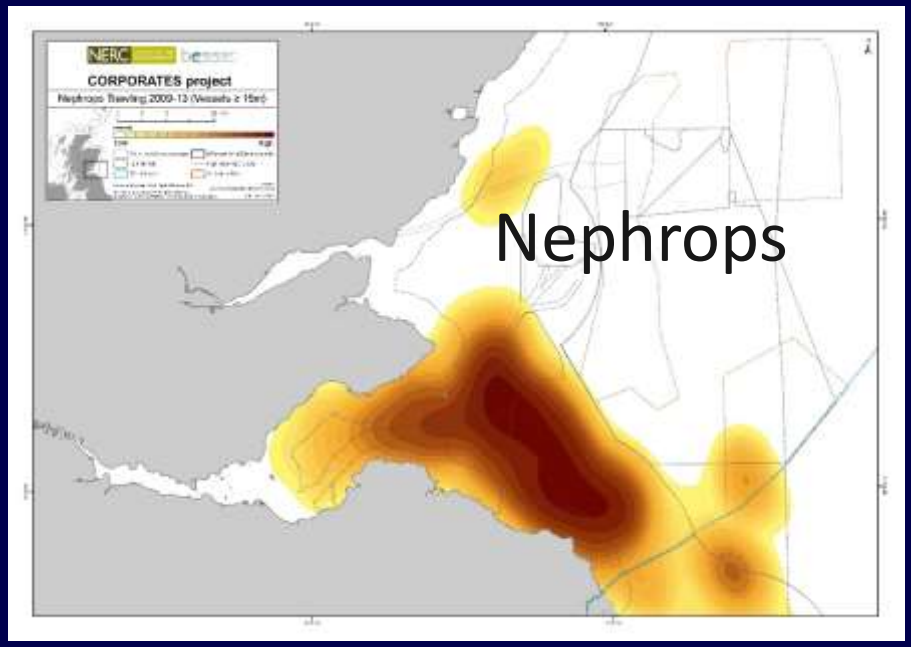
The times they are a changing……

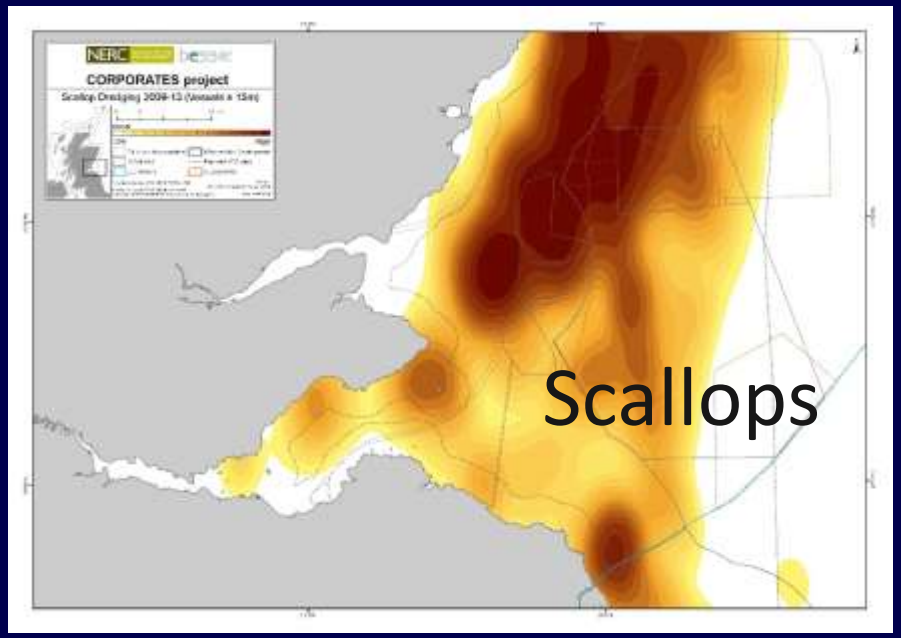
Energy Security and Climate Change = **Offshore Renewables**

Loss of Biodiversity and need for resilience under Climate Change = **Marine Protected Areas (MPAs)**

Fishing in FOF



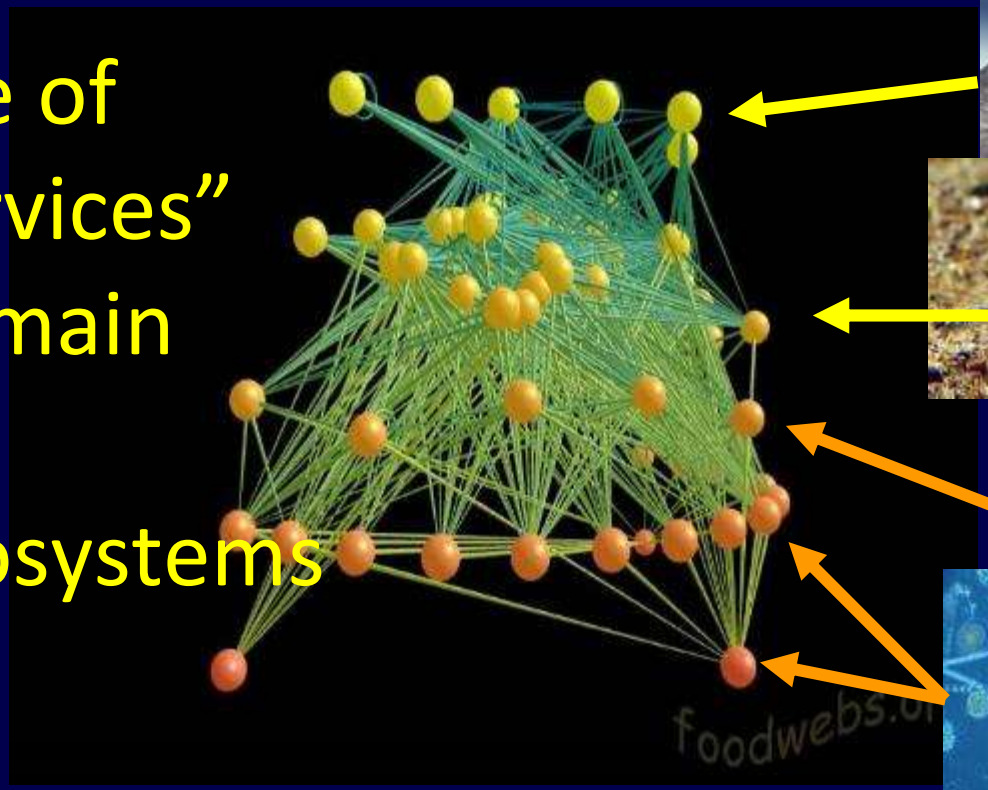




MSFD = Ecosystem Approach
REACTIVE to PROACTIVE

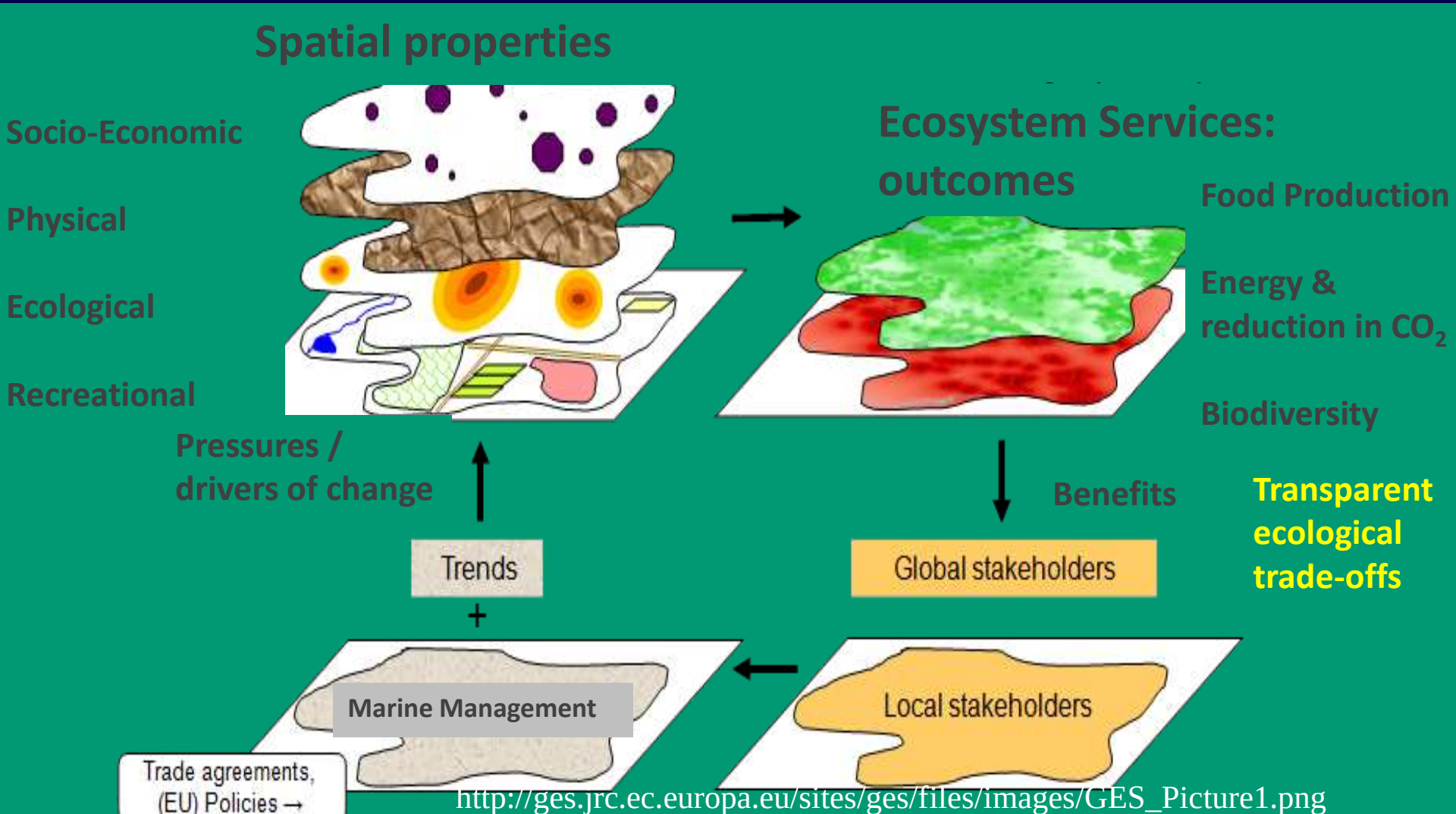
PROBLEM: Ecosystems are complex and we don't understand exactly how they work

Bring in the use of "Ecosystem services"
Which are the main outcomes of functioning ecosystems



What are ecosystem services?

At the moment – from SEA through EIA process
Use of multiple layers of information.
How are trade-offs made?



http://ges.jrc.ec.europa.eu/sites/ges/files/images/GES_Picture1.png

Exercise 1:Mapping (S) - then Benefits (M)

List of Benefits

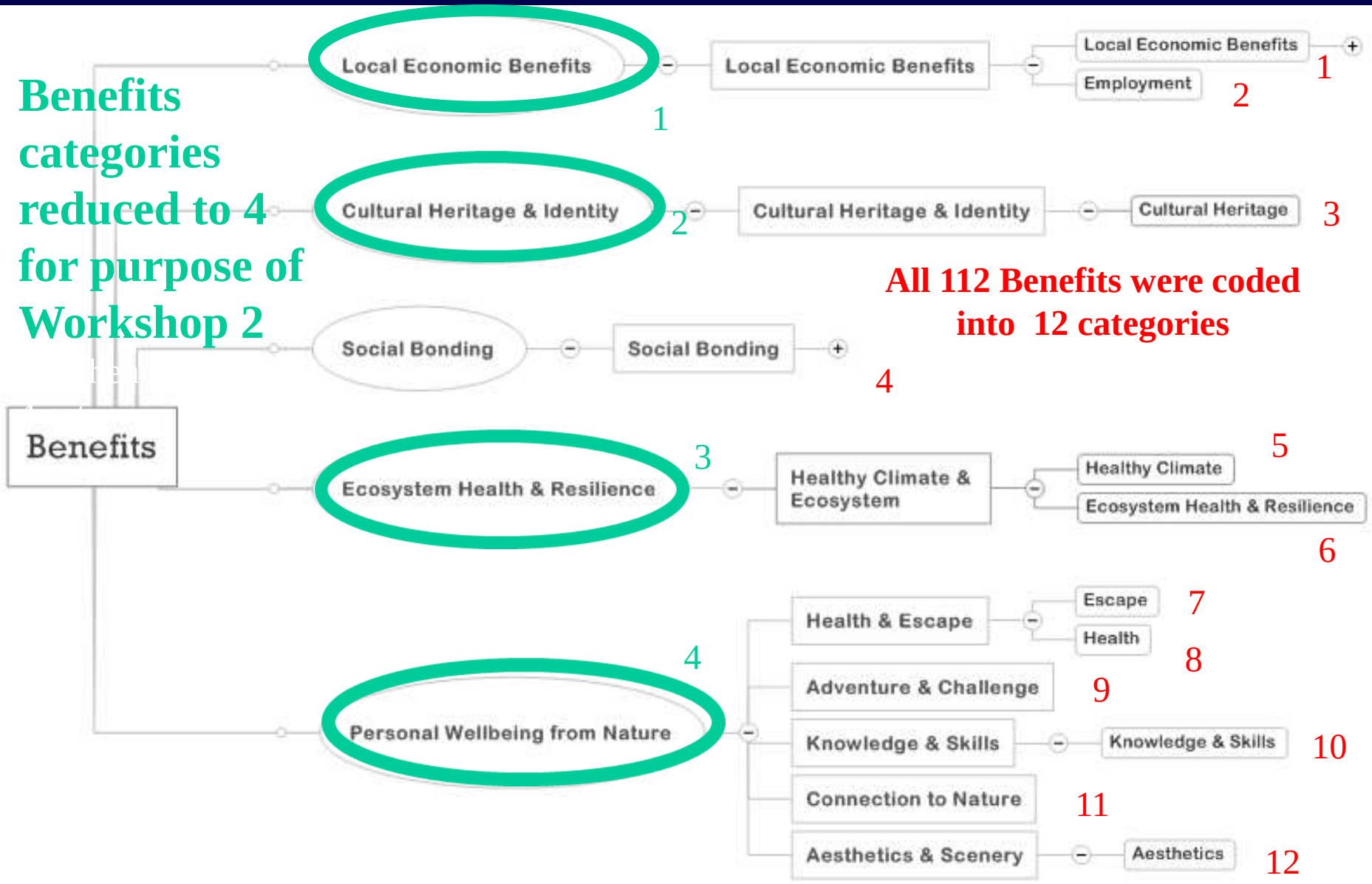
112 in total

Benefit	Sector
Family continuity	Fishing/Maritime
Learning about immediate environment	Fishing/Maritime
Feel good factor/satisfaction – My hobby is my work	Fishing/Maritime
Daily life in peripheral communities	Fishing/Maritime
Employment opportunities	Fishing/Maritime
Provision of employment	Fishing/Maritime
Use of natural resources to make a living	Fishing/Maritime
Contribute to local economy	Fishing/Maritime
Employment in infrastructure	Fishing/Maritime
Historical markets: Spectacle in modern times – Tourist attraction	Fishing/Maritime
Cultural heritage	Fishing/Maritime
Food provision	Fishing/Maritime
Fishing catch as local delicacy	Fishing/Maritime
Food as a nutrition	Fishing/Maritime
Food exports	Fishing/Maritime
Salmon & Sea trout recreation	Fishing/Maritime
Salmon & Sea trout food	Fishing/Maritime
Salmon & Sea trout as cultural heritage	Fishing/Maritime
Tourist industry & employment	Fishing/Maritime
Scotland's history	Fishing/Maritime
Infrastructure and main fuel access points	Fishing/Maritime
Community preservation/sense of community	Fishing/Maritime
Renewable energy generation	Renewables
Reduction of carbon emissions	Renewables
Contribution towards mitigation of climate change	Renewables
Environmental data generated through the EIA process	Renewables
Job creation (operation, manufacturing, maintenance)	Renewables
Infrastructure associated to renewables (e.g. Fife Energy Park)	Renewables
Employment/ Job creation	Recreation & Tourism
Economy	Recreation & Tourism
Tourism & economic	Recreation & Tourism
Wealth – via property prices	Recreation & Tourism
Education/Knowledge	Recreation & Tourism
Contributing to Science/research/academic study into ecological receptors	Recreation & Tourism
Weather event	Recreation & Tourism
Seasonal	Recreation & Tourism
Relaxation/Calm/Enjoyment/Leave problems behind	Recreation & Tourism
Friendships (working with groups on projects)	Recreation & Tourism
Shared experience	Recreation & Tourism
Long term friends	Recreation & Tourism
Social interactions/development	Recreation & Tourism
Youth activities	Recreation & Tourism
Personal development	Recreation & Tourism
Fitness/physical fitness	Recreation & Tourism
Testing your limits	Recreation & Tourism
Adventure	Recreation & Tourism
Well-being/ Spiritual wellbeing	Recreation & Tourism
Freedom/Escape	Recreation & Tourism
Health/Fresh air	Recreation & Tourism
Understanding heritage	Recreation & Tourism
Sporting success	Recreation & Tourism
Environmental appreciation	Recreation & Tourism
Nature/Closeness to nature	Recreation & Tourism
Introduces people to new activities and environments	Recreation & Tourism
Enjoying the scenery	Recreation & Tourism
Experience natural environment	Recreation & Tourism
Get away from man made things	Recreation & Tourism
Closeness to nature	Recreation & Tourism
History (uncovering history)/ Natural history awareness	Recreation & Tourism
Mental challenge/Good for your soul	Recreation & Tourism
Food	Recreation & Tourism
Renewable electricity	Recreation & Tourism
Play with boys toys (underwater photography)	Recreation & Tourism
Enjoyment of the natural world	Conservation & Ecological (Human)
Wildlife tourism (Isle of May/Bass Rock)	Conservation & Ecological (Human)
(Marine) Tourism	Conservation & Ecological (Human)
Coastal communities (and impacts on all marine incomes e.g. fisheries tourism)	Conservation & Ecological (Human)
Recreational (enjoyment/revenue)	Conservation & Ecological (Human)
Recreational fishing	Conservation & Ecological (Human)
Commercial fisheries	Conservation & Ecological (Human)
Develop an offshore wind industry and infrastructure in Scotland	Conservation & Ecological (Human)
MPAs increase commercial fish stocks (potentially)	Conservation & Ecological (Human)
Human geological study through protection	Conservation & Ecological (Human)
Scottish government policy/meet commitments for MPA networks	Conservation & Ecological (Human)
Grid availability	Conservation & Ecological (Human)
Jobs and investment	Conservation & Ecological (Human)
Study benefits of MPA protection	Conservation & Ecological (Human)
Low carbon energy	Conservation & Ecological (Human)
Feel good about trying to protect the environment	Conservation & Ecological (Human)
One of the few developable areas available in Scottish waters	Conservation & Ecological (Human)
Aesthetics	Conservation & Ecological (Human)
Carbon cycling and sequestration	Conservation & Ecological (Human)
Resilience	Conservation & Ecological (Animal)
Ecosystem resilience	Conservation & Ecological (Animal)
Healthy food webs for food production/Trophic functioning	Conservation & Ecological (Animal)
Food production for fish and shellfish	Conservation & Ecological (Animal)
Sense of place (importance of habitats to local populations	Conservation & Ecological (Animal)
Carbon cycling and sequestration	Conservation & Ecological (Animal)
Transportation	Conservation & Ecological (Animal)
Fishing ban (sand eels benefit)	Conservation & Ecological (Animal)
Designated area protection provides protection	Conservation & Ecological (Animal)
Sand eels feeding seabirds	Conservation & Ecological (Animal)
Food availability	Conservation & Ecological (Animal)
Suitable nesting habitat	Conservation & Ecological (Animal)
Estuarine habitat and food shelter	Conservation & Ecological (Animal)
Current patterns of food availability and diversity in area	Conservation & Ecological (Animal)
Sand eels good habitat availability	Conservation & Ecological (Animal)

W1 Exercise 2 Categorising Benefits Exercise 1

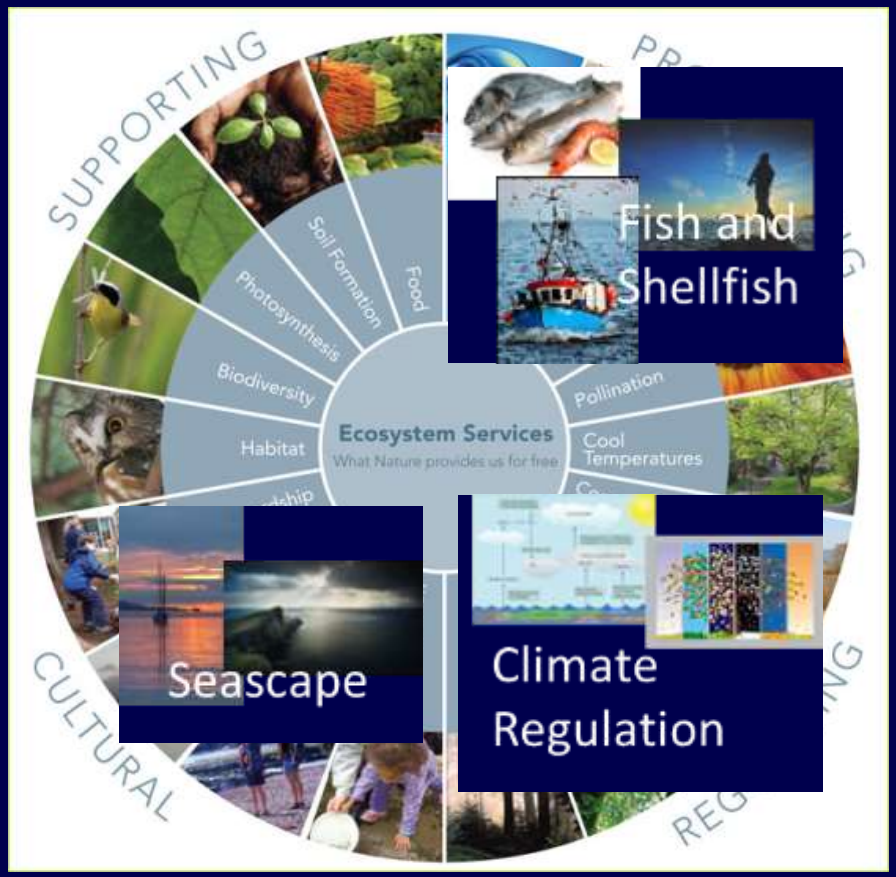
Benefits categories reduced to 4 for purpose of Workshop 2

All 112 Benefits were coded into 12 categories



Workshop 2 is about translating between Benefits and Ecosystem services: 3

Leading to transparent ecological trade-offs



Exercise 1 in WS 2: Linking Benefits & Ecosystem Services

B12 Aesthetics and Scenery

B1 Local Economic Benefit

Fish and Shellfish

Climate Regulation

B11 Connection to Nature

B2 Employment

B10 Knowledge and skills

COUNT up number of links for each ES – which benefits are they from?

B3 Cultural Heritage

B9 Adventure and challenge

Seascape

B4 Social Bonding

B8 Health

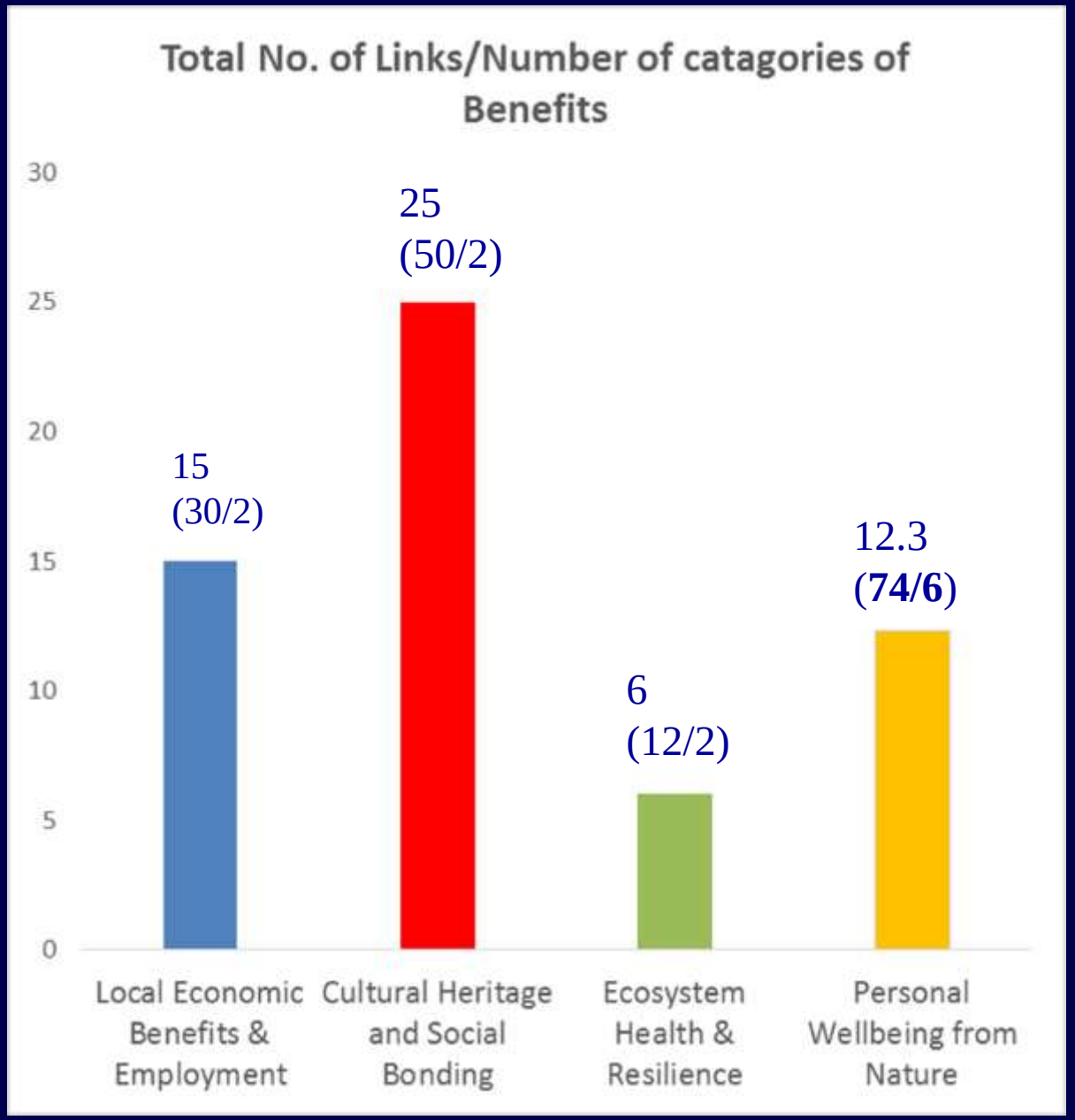
B7 Escape

B6Ecosystem Health and Resilience

B5 Healthy Climate

How do Stakeholders link Benefits to Ecosystem Services ?

Many more cultural /personal benefits than anticipated



W2 Exercise 2 Conceptual Model

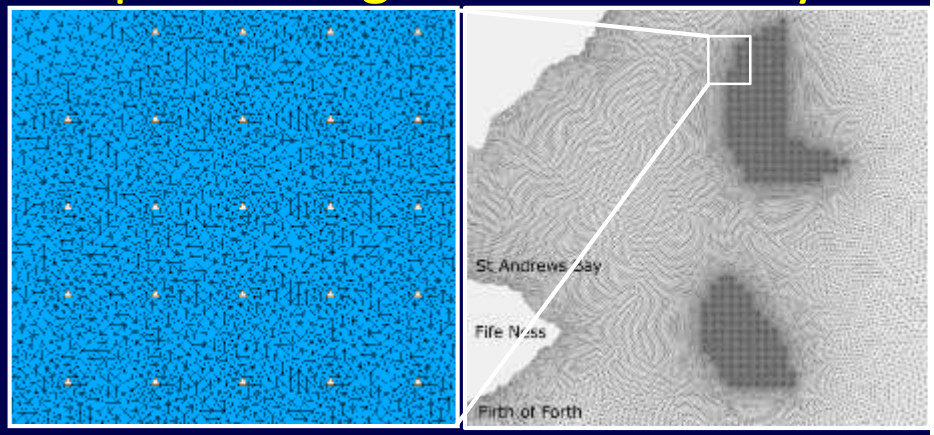
Aim: Conceptual Systems Model (CSM) :

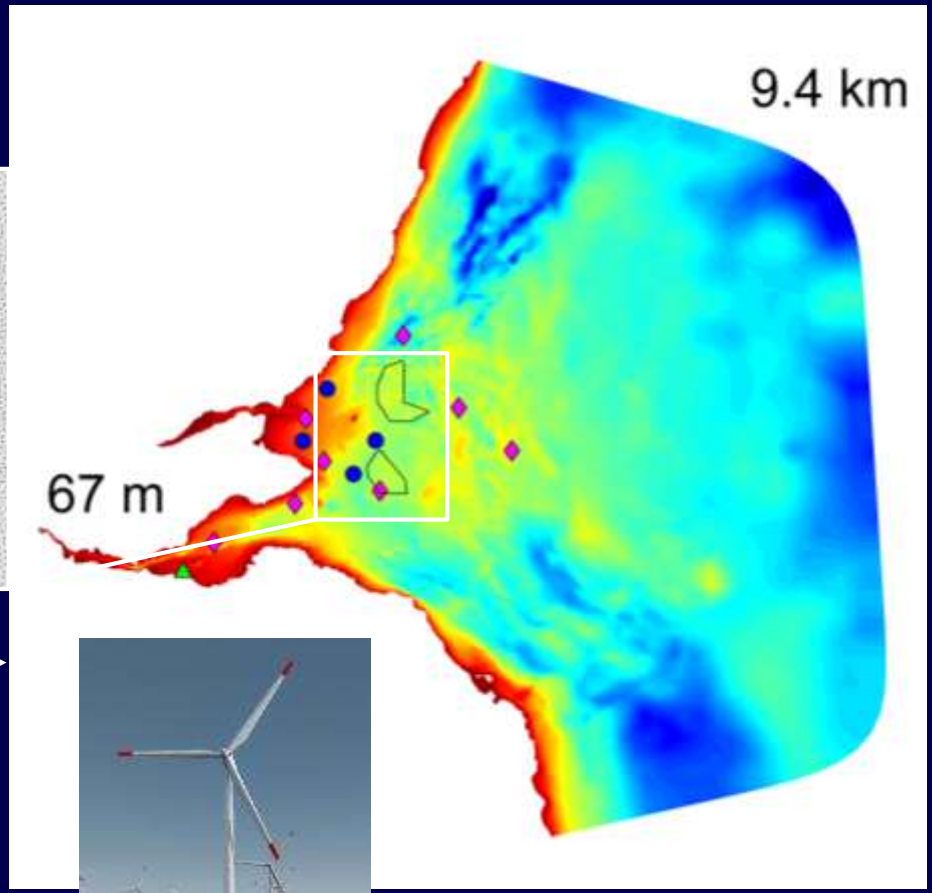
- Building a picture of the social-ecological system
- Looking at interactions between ecosystem services, activities, benefits and drivers of change (energy generation, MPAs, fisheries policy)
- Starting with the ecological model, then adding social components

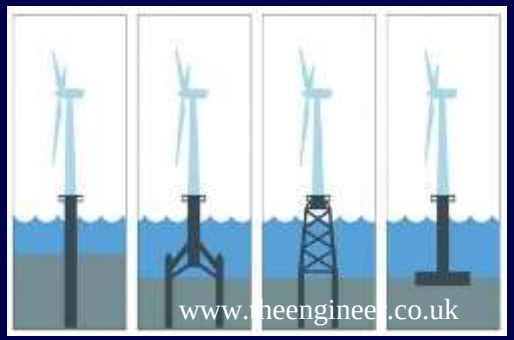
- Learning from each other!
- It’s not about drawing a perfect diagram, but about the discussion

Use of Ecological and Law & Policy Interludes – how much do they help?

Representing wind farm arrays





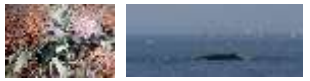


Cards for CSM exercise: the intermediate and Ecosystem Services

1

Formation of Habitats/Habitat Diversity

2



Species Diversity

3

Primary Production & Nutrient Cycling

4

Larval supply

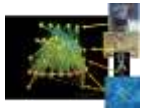
5

Carbon sequestration

6

Climate regulation & stability

7

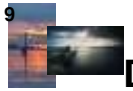


Ecosystem health & resilience

8

Quantity of fish & shellfish

9



Degree of naturalness, wildness & vastness

The Actions and Benefits

10
Number of cultural-historic features

13
Marine Tourism/ Recreation

16
Offshore Wind Energy

11
Fishing Catch

14
Personal Wellbeing from Nature

17
Number/size of Marine Protected Areas

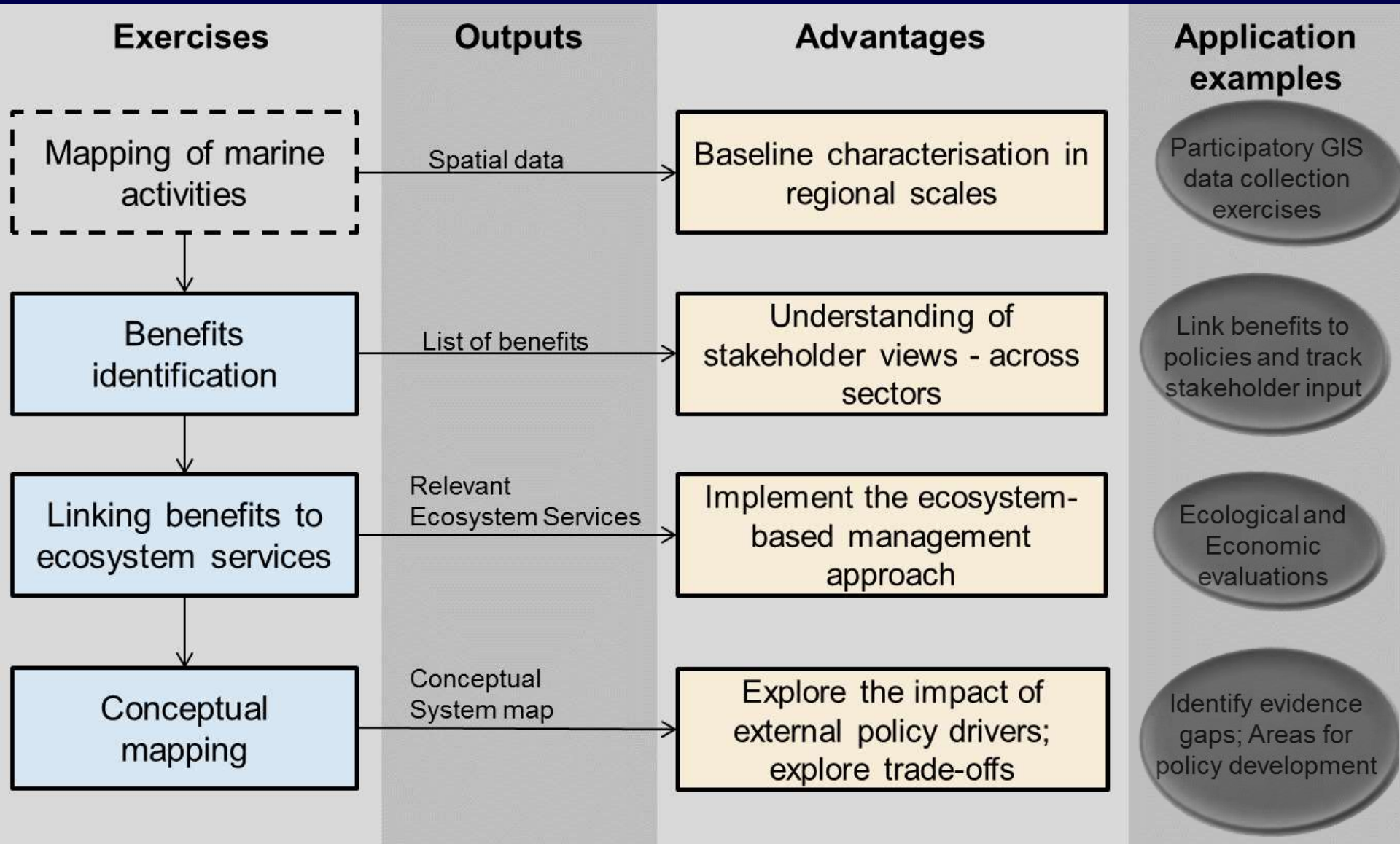
12
Cultural heritage & identity

15
Local Economic Benefits

Green
Table


Exercise 2 Conceptual Model

Using CORPORATES in Marine Regional Planning: roadtest by 22 planners



A Good Tool? Feedback from workshops

Stakeholders

- ✓ *"Liked working in a mixed group"*
- ✓ *"Interaction with other organisations was very useful – gaining understanding of others view."*
- ✓ *"Enjoyable"*
- ✓ *"Good interaction with other contributors – personal/social learning process"*
- ✓ *"People were prepared to listen – level of engagement between sectors was interesting"*

Planners

- ✓ *"Identification of ecosystems services is essential, but how do you actually use them to create policy? This process is a good way of explaining it."*
- ✓ *The process brings sectors and communities together in understanding. At a community level it could help an understanding of what policy meant personally to them, so it would not just be a consultation.*
- ✓ *"Outcomes of this process include a 'communal agreement', knowledge exchange and co-production between planners and stakeholders, and human interactions."*

CORPORATES: ^some of The Team

www.corporatesproject.co.uk

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