

# CBA - benefits

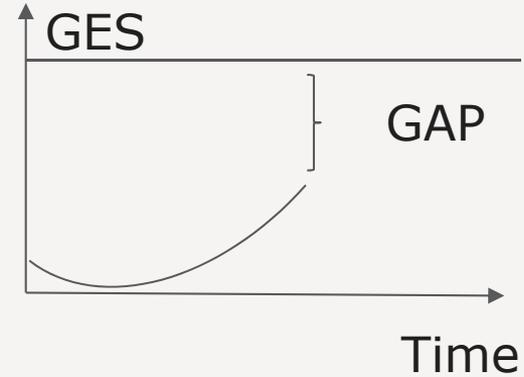
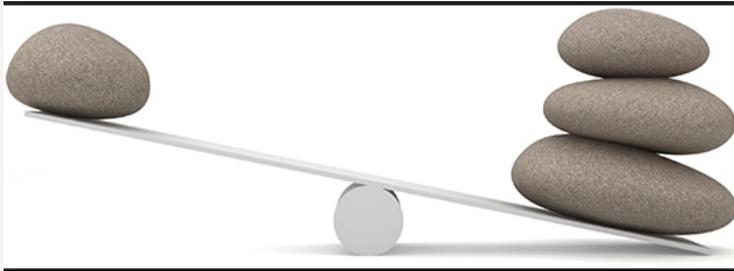
# Outline of presentation

- > Intro to CBA
- > Benefits
- > Measures (specific for BLACK)
- > Example of benefit assessment in Scotland
- > Discussion on methodology to be used in this context

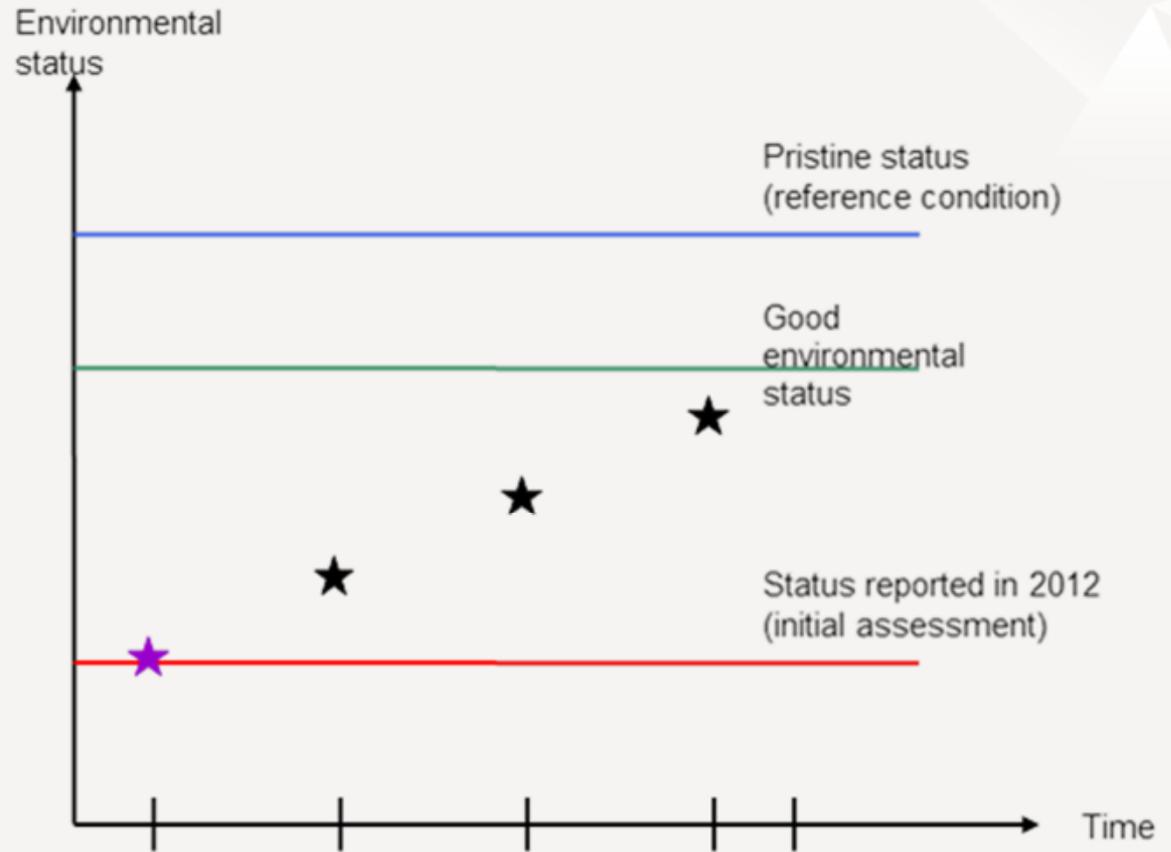
# Intro CBA

Why is this necessary?

- MSFD requirement
- Political decision making
- Application for financing



# Step by step



- ★ Present status based on initial assessment
- ★ Environmental status progressing over time in relation to [interim] targets to achieve GES

# Discussion on methodology to be used in this context



# Identifying benefits – ecosystem services

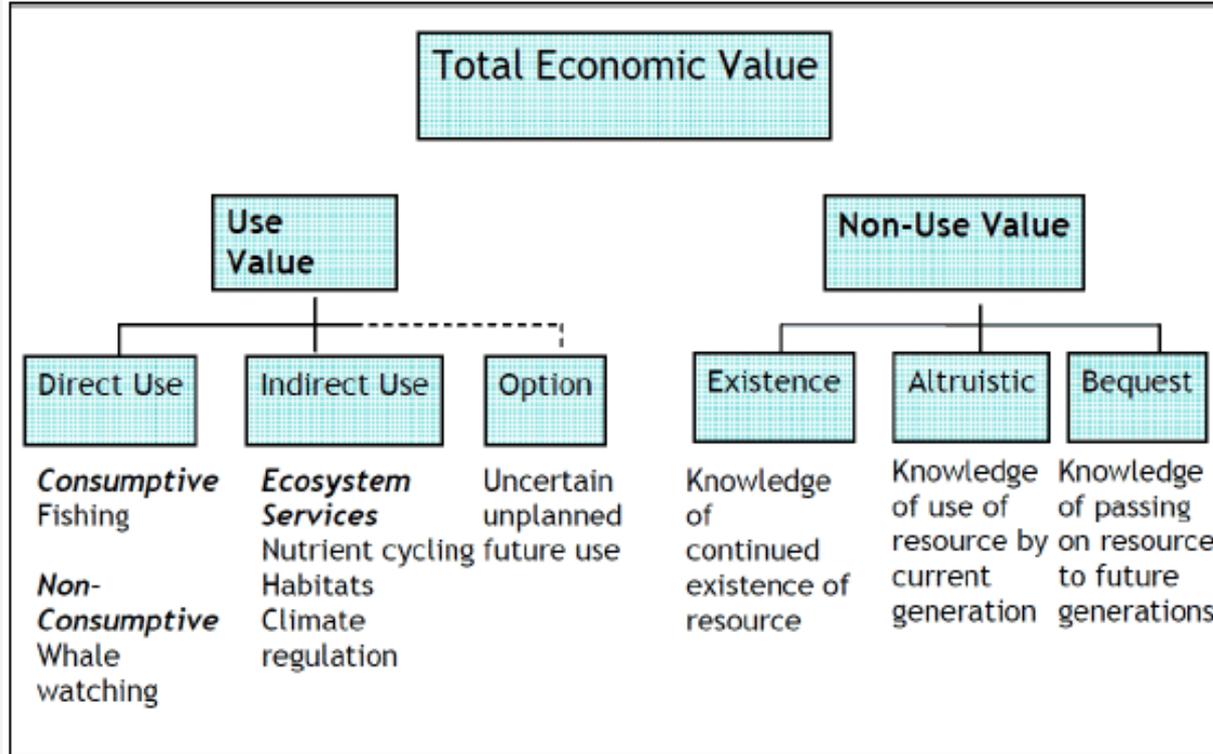
Section	Division	Group	Class	Class type	Examples
<i>This column lists the three main categories of ecosystem services</i>	<i>This column divides section categories into main types of output or process.</i>	<i>The group level splits division categories by biological, physical or cultural type or process.</i>	<i>The group level splits division categories by biological, physical or cultural type or process.</i>	<i>Class types break the class categories into further individual entities and suggest ways of measuring the associated ecosystem service output.</i>	
Provisioning	Nutrition	Biomass	Cultivated crops	Crops by amount, type	Cereals (e.g. wheat, rye, barely), vegetables, fruits etc.
			Reared animals and their outputs	Animals, products by amount, type	Meat, dairy products (milk, cheese, yoghurt), honey etc.
			Wild plants, algae and their outputs	Plants, algae by amount, type	Wild berries, fruits, mushrooms, water cress, Salicornia (saltwort or samphire); seaweed (e.g. Palmaria palmata = dulse, dillisk) for food
			Wild animals and their outputs	Animals by amount, type	Barns, freshwater fish (trout, eel etc.), marine fish (plaice, sea bass etc.) and

- Types of ES:
- Provision
  - Regulatory/maintenance
  - Cultural

<http://biodiversity.europa.eu/maes/common-international-classification-of-ecosystem-services-cices-classification-version-4.3>

COWI

# How are benefits estimated in monetary terms?



# Example from Scotland of a TEV of the marine litter

Total Economic Value	Economic Impact of Litter		Turnover	Scale	Source
<b>Direct use of the ecosystem</b>					
<b>Consumptive uses</b>					
Fisheries	£ 10 280 000 p.a.	£ 443 million (2008)	Scotland	Mout <i>et al</i> 2010; Scottish Sea Fisheries Statistics 2009	
Aquaculture	£ 133 562 p.a.	£ 367 million (2008)	Scotland	Mout <i>et al</i> 2010	
Oil and gas	No data	£ 28.6 billion (2006)	UK	Pugh 2008	
Agriculture	£841 / croft / pa	£2.28 billion (2008)	Shetland	Mout <i>et al</i> 2010, Scottish Economic Statistics 2008	
Recreational Angling	No data	£69.67 million (2009)	Scotland	Scottish Government 2009	
<b>Non Consumptive</b>					
Ports and Harbours	£1 385 386 p.a.	£8.1 billion (2008)	UK / Scotland	Mout <i>et al</i> 2010, Ports.org.uk, Pugh (2008)	
Marinas	Emerging data	£113 million (2007)	UK	BMF (2007)	
Tourism (Scottish total)	No data	£ 5.8 billion (2008)	Scotland	Deloitte 2008.	
Marine and Coastal Wildlife Tourism	No data.	£92 million (2010)	Scotland	Scottish Government 2010	
Recreational Sailing	No data	£101 million (2010)	Scotland	Scottish Enterprise 2010	
Local authorities	£3 004 895		Scotland	Hall (2000) & Moat <i>et al</i> (2010)	
Renewables	No data	32 million (2008)	UK	Pugh (2008)	
Emergency services	£1 882 540 p.a.		UK	Moat <i>et al</i> (2010)	
<b>Indirect Use</b>					
Volunteering	£112 906		Scotland	Mout <i>et al</i> 2010	
Visual amenity	No data				
Ecosystem services	No data				

Estimation of the cost in sectors due to the present of marine litter

# WTP – Marine environment in the UK

Conditional logit model and WTP estimates.

	Coefficient	Std. Err.	WTP (£)
ASC_CHANGE	-0.476 <sup>***</sup>	(0.101)	
SPEC10	0.227 <sup>***</sup>	(0.075)	5.70
SPEC25	0.288 <sup>***</sup>	(0.055)	7.22
PROT25	1.047 <sup>***</sup>	(0.066)	26.24
PROT50	1.320 <sup>***</sup>	(0.066)	33.07
INVASIVE	-0.915 <sup>***</sup>	(0.051)	-22.93

Description	Dogger Bank Management Plan A "no change"	Dogger Bank Management Plan B	Dogger Bank Management Plan C
Diversity of species 	No change in species diversity	25% increase in species diversity	10% increase in species diversity
Protection of porpoises, seals and seabirds 	Porpoises, seals and seabirds <b>Not Protected</b>	Porpoises, seals and seabirds <b>Protected on 50% of area</b>	Porpoises, seals and seabirds <b>Not Protected</b>
Invasive species 	<b>Restricted spread</b> of invasive species	<b>Wide spread</b> of invasive species	<b>Wide spread</b> of invasive species
Additional tax 	Additional tax <b>£0</b> per household per year	Additional tax <b>£20</b> per household per year	Additional tax <b>£5</b> per household per year
Please select your answer here:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# Measure 1

## > The measure

- > Designation of zones for beam trawling. Long-term observation on the impacts in the designated zones permitted for beam-trawling. Research on the activities. When necessary change of usage requirements.
- > **What are the direct benefits from this measure?** (the environmental target) – less beam trawling – maintain the distribution of seabed species/habitats, reach MSY (by reduction of mortality)
- > **Who will benefit from the impact of this measure?** Society through improved seabed, biodiversity and food chain
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Depends directly on the share of zones
- > How are the benefits estimated:
  - > increase in income for the fishing sector in mid to long term
  - > Example 2-5 fold if changing from present fishing regime to MSY, 8- 20 years till realised (source: The Economic Value of Rebuilding Fisheries, OECD)
  - > maintain quality of seabed habitatst - CV of the protection of species. Example from Dogger bank (17,600 km<sup>2</sup>)
    - > protection of 10% species 5.7 £
    - > protection of 20% species 7.2 £
  - > remove or stress element of the food chain

# Measure 4

## > The measure

- > Setting regulations or prohibitions on activities within MPAs or potentially affecting the MPA (No constructions and industrial activities, no motorsports (high speed boats),...)
- > **What are the direct benefits from this measure?** (the environmental target) – MPA, seabird, seabed habitat, water column habitat, no permanent alteration
- > **Who will benefit from the impact of this measure?** Leisure activities, tourism, fishing sector, society through improved seabed, biodiversity and food chain
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Depends on the size of the MPA covered
- > How are the benefits estimated:
  - > the value of a MPA
  - > Example from Dogger bank (17,600 km<sup>2</sup>)
    - > protection of 25% of the area 26.24 £
    - > protection of 50% of the area 33.07 £

# Measure 5

## > The measure

- > Control on prohibitions of activities within or near MPAs

> **What are the direct benefits from this measure?** (the environmental target) – MPA, seabird, seabed habitat, water column habitat, no permanent alteration

> **Who will benefit from the impact of this measure?** Leisure activities, tourism, fishing sector, society through improved seabed, biodiversity and food chain

> **How ambiguous is the measure?** (How much of the GAP does it cover?) Depends on the size of the MPA covered and the intensity of the control

> How are the benefits estimated:

- > the value of a MPA
- > Example from Dogger bank (17,600 km<sup>2</sup>)
  - > protection of 25% of the area 26.24 £
  - > protection of 50% of the area 33.07 £

# Measure 11

## > The measure

- > Stimulation of environmental friendly practices in small scale fisheries Rem: to define SSF BG and RO ? (FAO Glossary tends to equate "artisanal" with "small-scale". From a technological point of view, however, these are connected but have somewhat different concepts related, on the one hand, to the size of the fishing unit (the scale) and, on the other hand, to the relative level of technology (or "artisanality") expressed as the capital investment / man-on-board)).
- > **What are the direct benefits from this measure?** (the environmental target) – protection of species, seabird, seabed habitat, water column habitat
- > **Who will benefit from the impact of this measure?** The fishing sector, seabed and water column species
- > **How ambiguous is the measure?** (How much of the GAP does it cover?). Depends on the number of fishermen shifting
- > How are the benefits estimated:
  - > Will the fishermen lose income ???
  - > Example from Dogger bank (17,600 km2)
    - > protection of 10% species 5.7 £
    - > protection of 20% species 7.2 £

# Measure 13

## > The measure

- > Precise the spatio-temporal bans and closures for fish species (not commercial) - fisheries
- > **What are the direct benefits from this measure?** (the environmental target) – protection of species, seabird, seabed habitat, water column habitat
- > **Who will benefit from the impact of this measure?** The fishing sector, seabed and water column species
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Depends on the time closed, size and the number of species
- > How are the benefits estimated:
  - > maintain quality of seabed habitatst - CV of the protection of species. Example from Dogger bank (17,600 km<sup>2</sup>)
    - > protection of 10% species 5.7 £
    - > protection of 20% species 7.2 £

# Measure 18

## > The measure

- > Development of Regional Marine litter Action Plan (joint methodology for quantifying the marine litter, identification of sources, prosecution of offenders, etc.)
- > **What are the direct benefits from this measure?** (the environmental target) – reduce marine litter, protection of species, reduce contamination of food, aesthetic coasts, obstruction to marine industries
- > **Who will benefit from the impact of this measure?** Leisure activities, tourism, fishing sector, society through improved food security
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Depends on the content of plan
- > How are the benefits estimated:
  - > negative cost for the fishermen of the catches of waste
  - > estimates value of clean beaches Example from "Recreational benefits of reduction of litter in the marine environment"
    - > 0.6 till 1.6 euro per beach day / person
  - > protection of species. . Example from Dogger bank (17,600 km<sup>2</sup>)
    - > protection of 10% species 5.7 £
    - > protection of 20% species 7.2 £
  - > food security

# Measure 23

## > The measure

- > Ratification and implementation of the BWM Convention by the BS countries
- > **What are the direct benefits from this measure?** (the environmental target) – Harmonise ballast water procedure – 100% treatment of ballast water – identify action in against BW in Black sea region (will only be a benefit if all BS countries ratify)
- > **Who will benefit from the impact of this measure?** Fishing industry, tourism, nature conservation
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Reduce rate of introduction and prevent introduction of new species
- > How are the benefits estimated:
  - > the value of invasive species
  - > Example from Dogger bank (17,600 km<sup>2</sup>) of what the public are willing to pay to avoid invasive species
    - > Estimate negative

# Measure 24

## > The measure

- > Limiting the impact of fishing on the marine environment (technical improvements to mitigate the impact on marine environment, e.g. mesh size restrictions) Aim: to achieve MSY

## > **What are the direct benefits from this measure?** (the environmental target) –

Manage fishing effort – sustainable fish stocks

## > **Who will benefit from the impact of this measure?** The fishing sector, birds and mammals

## > **How ambiguous is the measure?** (How much of the GAP does it cover?) – very – consequences will involve fewer fisher

## > **How are the benefits estimated:**

- > increase in income for the fishing sector in mid to long term
- > Example 2-5 fold value added if changing from present fishing regime to MSY, 8- 20 years till realised (source: The Economic Value of Rebuilding Fisheries)

# Measure 26

- > The measure
  - > Development of common multiannual management plan for certain stocks
  
- > **What are the direct benefits from this measure?** (the environmental target) – Manage fishing effort – sustainable fish stocks
- > **Who will benefit from the impact of this measure?** Fishermen (mid to long term, mammals and birds as feed)
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Bilateral agreement + regional acceptance – will depend on the content of the plan
  
- > How are the benefits estimated:
  - > The value added by the fishing sector

# Measure 31

## > The measure

- > Research activities related to better knowledge about impact of atmospheric deposition on the marine environment
- > **What are the direct benefits from this measure?** (the environmental target) – first step in setting up new measures
- > **Who will benefit from the impact of this measure?** Related sectors ???
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) Depends on the field of research
- > How are the benefits estimated:
  - > ??? very uncertain and long term

# Measure 33

## > The measure

- > Alignment of BG and RO Environmental Impact Assessment (EIA) procedures related to investment intentions through the EEZ of BS countries with significant transboundary effects with respect to MSFD 2008/56/EO
- > **What are the direct benefits from this measure?** (the environmental target) – secure an equal baseline - harmonise
- > **Who will benefit from the impact of this measure?** ??? investor
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) – long term potentials – uncertain at this stage
- > How are the benefits estimated:
  - > Very uncertain

# Measure 38

## > The measure

- > Introduction of eco labelling

- > **What are the direct benefits from this measure?** (the environmental target) – improve the standard of the fish for consumption
- > **Who will benefit from the impact of this measure?** The fishing sector
- > **How ambiguous is the measure?** (How much of the GAP does it cover?) – depends on the national/exports markets demand and the willingness of the fishing sector.

- > How are the benefits estimated:
  - > Value added in the fishing sector



# Thank you

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