Wadden Sea Symposium 2012

Fisheries management in the Wadden Sea from an economic perspective

Sustainable use of stocks and the preservation of ecosystem services

Dr. Ralf Doering, vTI-Institute of Sea Fisheries, Hamburg

Overview

- General Remarks
- Situation of fish stocks in the North Sea – improvements but still a lot to do
- Economic background of stock recovery
- The concept of ecosystem services and preservation of these services in a fisheries context
- Economic valuation of ecosystem services as a chance to improve conservation status?
- Summary and Outlook

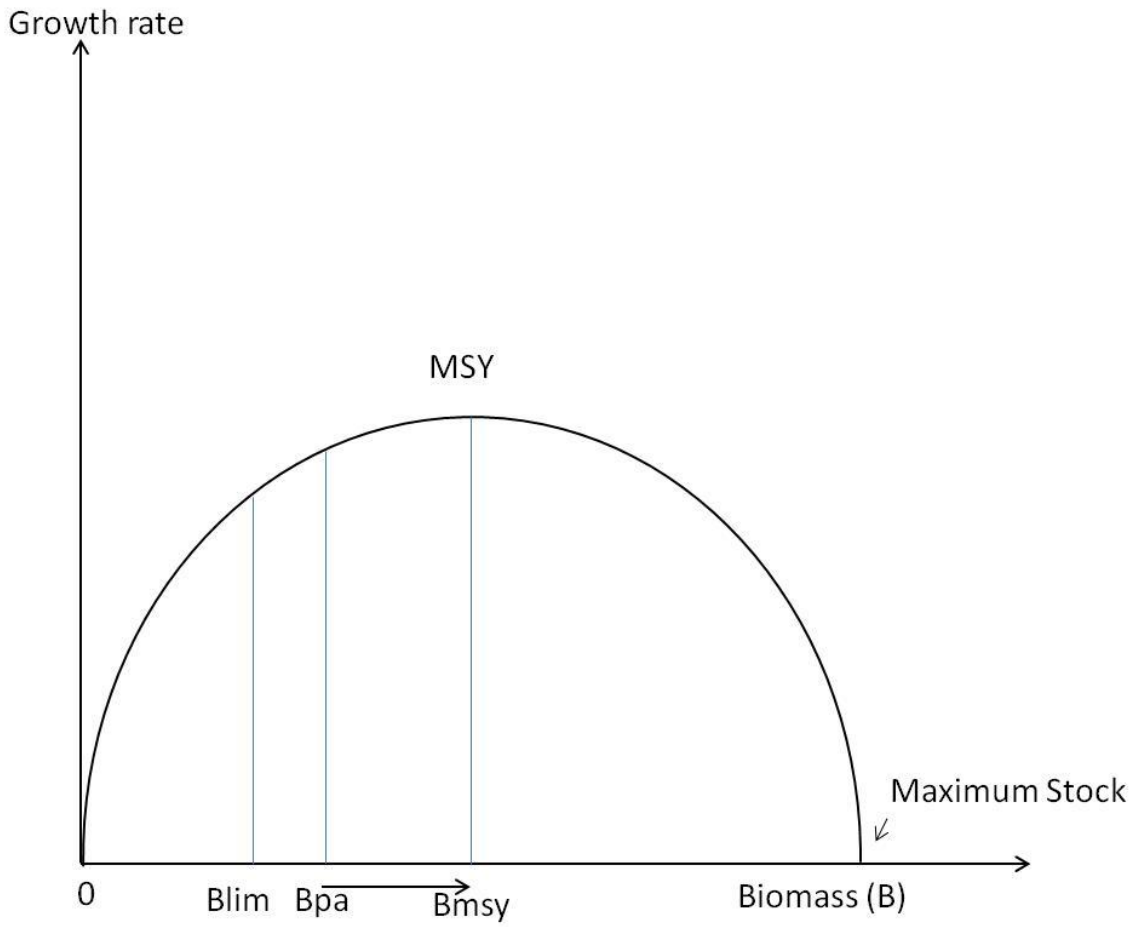
General Remarks

- **Increasing competition for space, Increasing negative environmental effects in coastal areas => Flora-Fauna-Habitat and Marine Strategy Framework Directives to address that**
- **The concept of ‚ecosystem services' is more and more influential**
- **Ecosystem services are (Millenium Ecosystem Assessment):**
  - **Supporting services (e.g. primary production)**
  - **Provisioning services (e.g. seafood)**
  - **Regulating services (e.g. carbon sequestration)**
  - **Cultural services (e.g. recreational services)**
- **The use of one service (harvesting of fish) can influence other services**
- **=> Goal is to harvest fish sustainably and with fewer negative effects on the ecosystem**

General Remarks

- **The EU changed its biological target for the sustainable use of a stock from following the Precautionary Approach (PA) to the MSY-concept in 2009**
  - **PA: preserving the reproductive capacity of a stock**
  - **MSY: Maximum (long term) sustainable yield**
  - **MSY stock levels are often higher than PA levels**

Precautionary Approach vs. MSY



General Remarks

- **Stocks not on MSY level can now fall in the category ‚overfished' even if they over Bpa**
  - **This was the reason for the 88% of stocks as not fished at MSY level in the EU Commissions Green Paper (but does that mean still overfished?)**
- **MSY concept regarding spawning stock biomass not working => high risk of overexploitation**
  - **Some fisheries biologists still claim that they can predict biomass targets for MSY by using single species surplus production models**
- **There is, however, wide agreement that fishing mortality allowing MSY is the target and not a certain biomass corresponding to MSY (several reasons for fluctuation of stocks)**

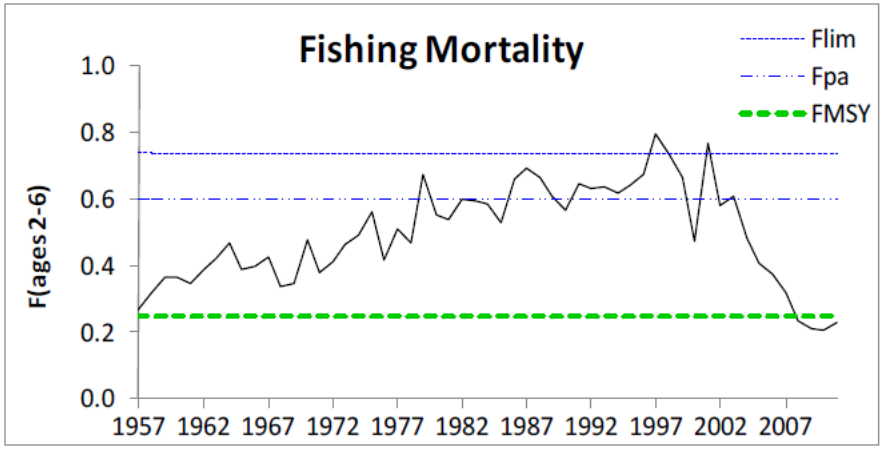
General Remarks

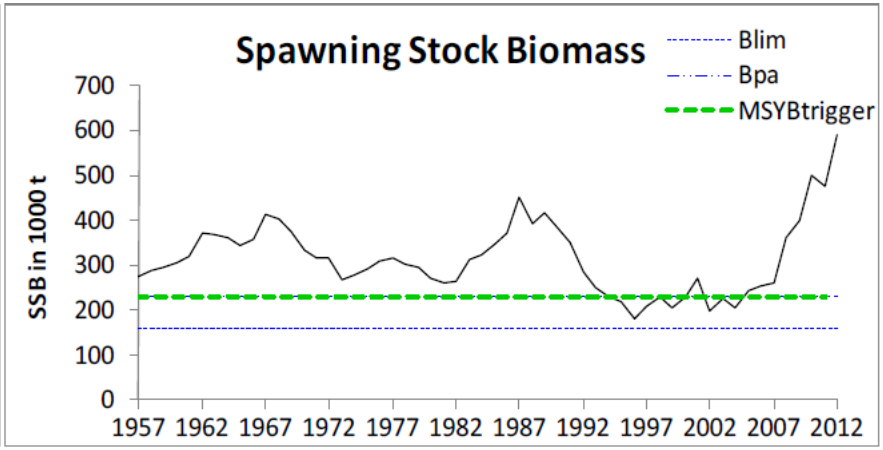
- **There seems to be (at least in Germany)**
  - **a general perception that in the North Sea all stocks are overfished**
  - **the opinion that many fisheries are very destructive to the marine environment**
- **Optimal management of stocks in an economic sense means sustainable use of stocks (now Maximum Sustainable Yield as target) and reduction of so-called negative external effects on the environment**

Situation of fish stocks in the North Sea – improvements but still a lot to do

- **Short overview on some of the most important stocks in the North Sea**

  - harvested sustainably (Plaice, Haddock, Herring, Saithe…)



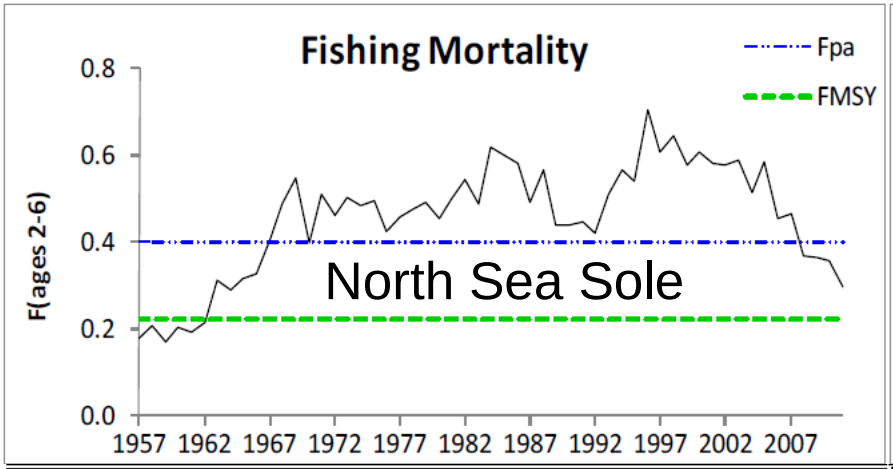


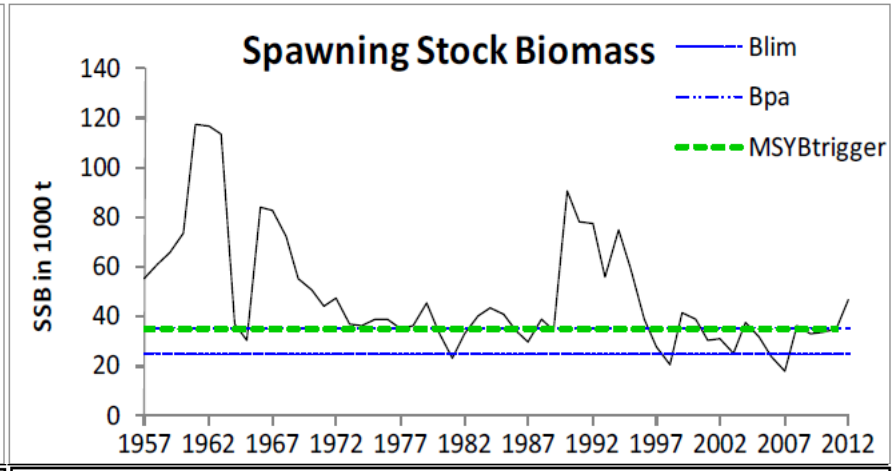
Sources: ICES 2012

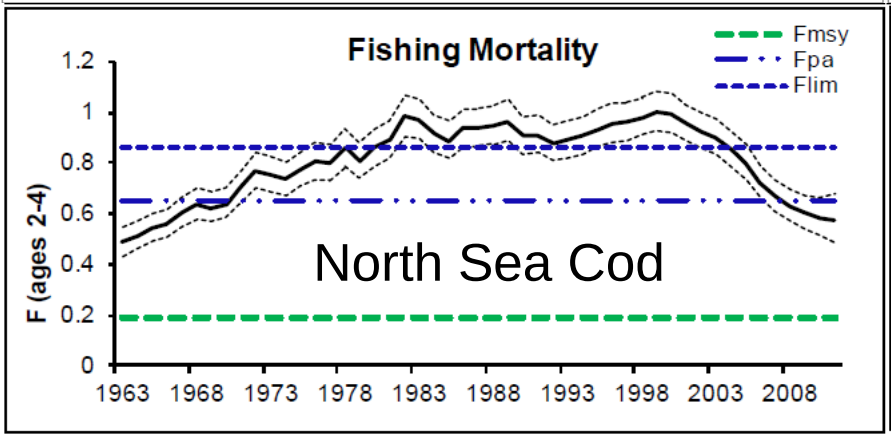
North Sea Plaice

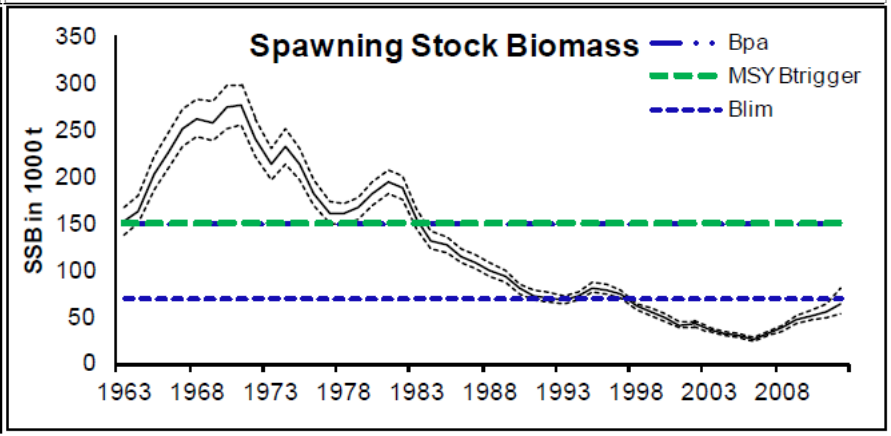
Situation of fish stocks in the North Sea – improvements but still a lot to do

- **harvested (not yet) sustainably (sole, cod…)**









Implications for the Wadden Sea

- **Plaice stock with highest level ever measured, sole stock improving**
- **Other flat fish stocks not assessed but seem not to be in trouble**
- **Low cod stock may have an influence on the abundance of shrimps**
- **Shrimp stock seems to be quite high**
- **Due to low prices for plaice several larger beam trawlers moved to shrimp fishing in 2009 => low shrimp prices**
- **Situation improved but prices for plaice still relatively low**

Economic background of fisheries management

- **Efficient use of resources means:**
  - **The quota fished out with the lowest possible costs => no overcapacities**
  - **So far not considered: external costs (bycatch, destructions of habitats, etc.)**
- **Recovery programs mean short term losses vs. long term gains**
- **Fishermen have no security for long term gains => in the past very much in favor of going on without recovery**
- **Only few examples for economic assessments**

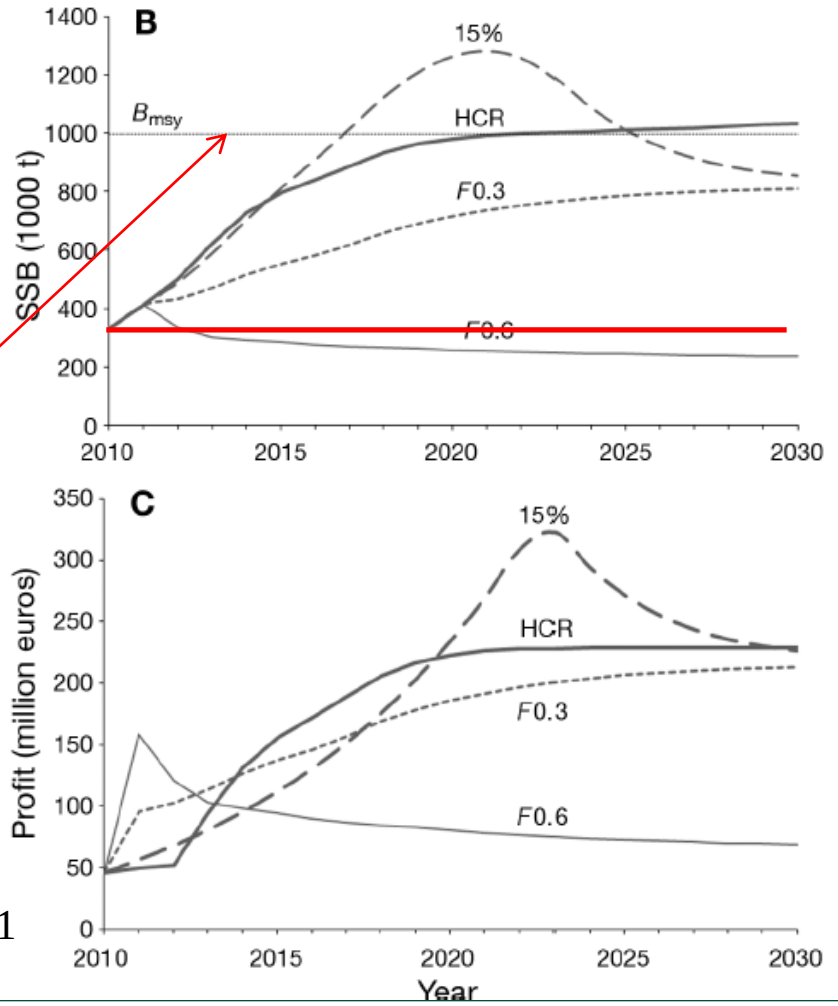
Economic background of stock recovery – Baltic cod

Table 3 – Net present values of profits from alternative fishing scenarios over a 50 year time horizon and different real discount rates

Discount rate (%)	Net present value (million euros)			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
0.0	750	2768	3077	3750
2.0	469	1503	1737	2347
4.0	318	857	1036	1589
13.4	105	105	155	679

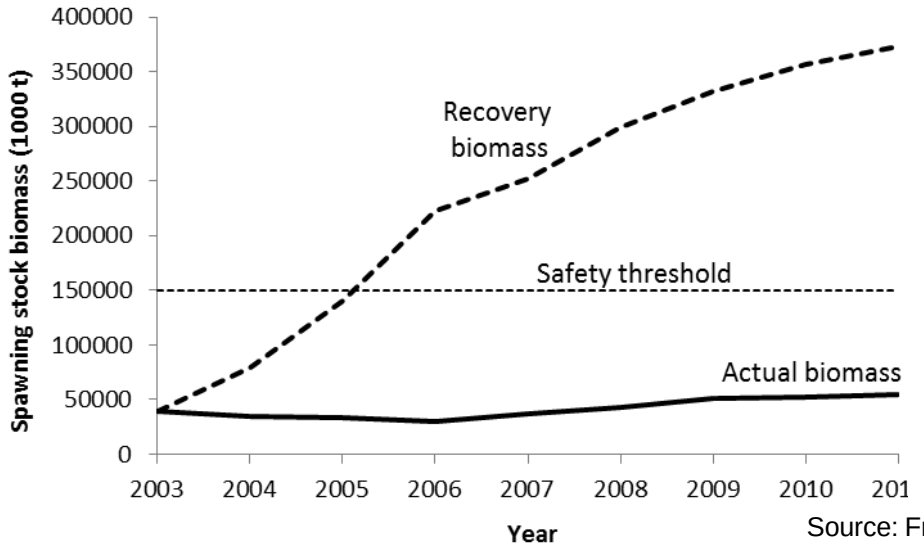
Döring & Egelkraut 2008

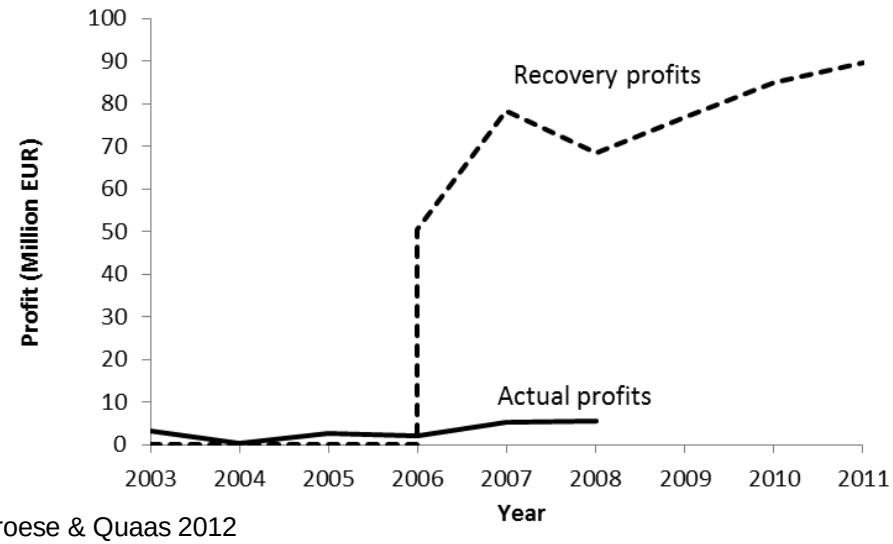
Problem: This shall be the development with the actual management plan – but is not happening due to unrealistic high biomass-level for MSY



Froese & Quaas 2011

Economic background of stock recovery – North Sea cod





Source: Froese & Quaas 2012

Problem from a biological standpoint: again very high biomass levels (ICES Bmsy trigger by 150.000 t)

Problem for the fishing sector: high losses at the beginning, gains after some years – but what happens in the transition phase?

Economic background of stock recovery

- **Overfishing situation changed due to long term management plans as fishermen have more security (flatfish plan already in 2007)**
- **Discussion will move away from overfishing to reduction of negative external effects or preservation of ecosystem services**

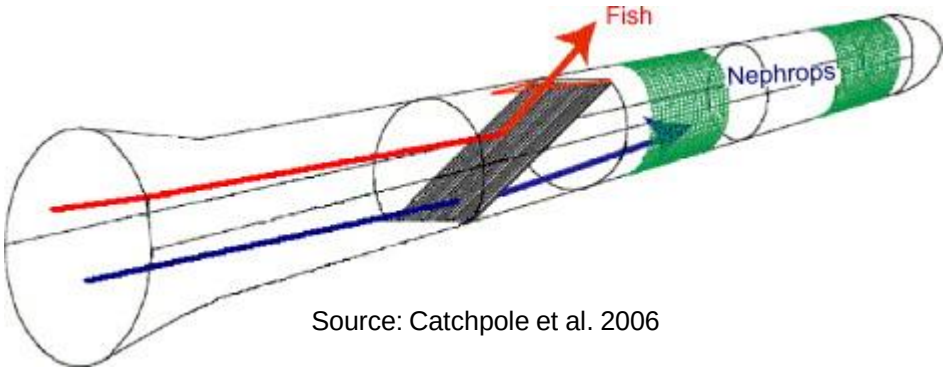
The concept of ecosystem services and preservation of these services in a fisheries context

- Fisheries with several negative effects on habitats and species (e.g. bycatch of target (juveniles)-, non-target species, birds and marine mammals)
- Influence of long term use potentials – in a destructed ecosystem also many stocks of commercial fish species will be lower
- Way to reduce negative effects:
  - technical improvements in the fishing methods,
  - change of fishing methods,
  - avoidance of certain areas or seasons

Technical improvements in fishing methods

- **E.g.: New technical devices in nets allow for a reduction in cod bycatch in the North Sea**
  - **Followed the requirement for less than 1.5% cod bycatch in the long term management plan**

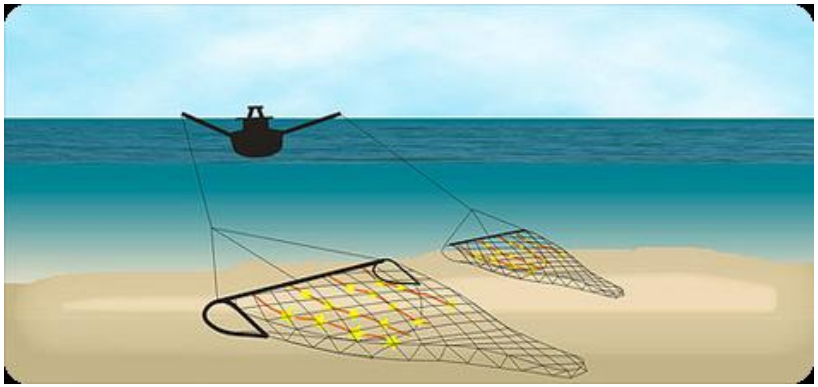
Source: http://www.trawlerphotos.co.uk/



Source: Catchpole et al. 2006

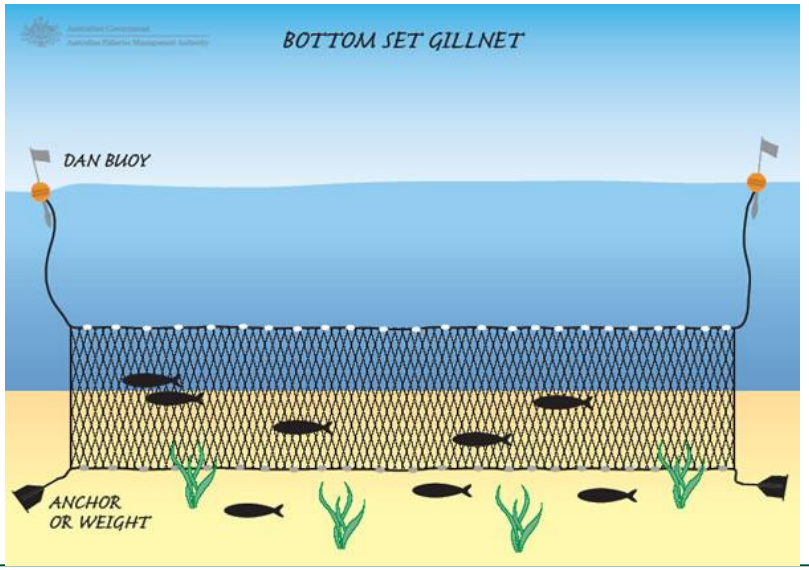
Changing in fishing methods

- **Move from bottom trawling to bottom gill nets**



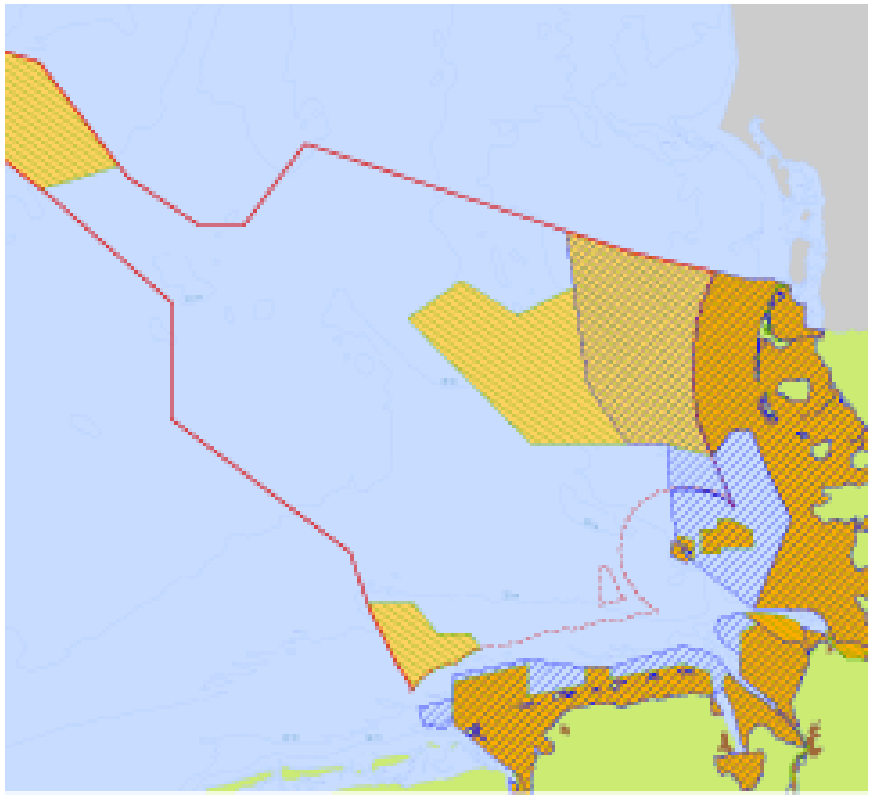
Source: http://www.ecomare.nl/

Source: http://www.afma.gov.au/



Area and seasonal closures

- **Natura 2000 areas in Germany's part of the North Sea: probably some total closures and seasonal closures**



Few remarks on the flatfish and shrimp fishery in the Wadden Sea

- **Flatfish fishery with a negative influence on bottom habitats – but unclear how severe they are in specific areas**
- **Alternative techniques are most likely also not unproblematic – bottom gill nets**
- **Bycatch in the shrimp fishery often survives (flatfish species) – why not discarding?**
- **A change in the fishing practice often means higher costs for fishermen – but regulations differ => fair competition issues**

Economic valuation of ecosystem services as a chance to improve conservation status?

- Several methods to assess the economic value of ecosystem services
  - Market prices (e.g. seafood, tourism)
  - Travel cost method (indirect valuation method)
  - Contingent valuation method (direkt valuation method – willingness to pay/accept)
- VECTORS project with the aim to provide economic values for ecosystem services in the North Sea
- If we can have values for every ecosystem service we will be able to do a full Cost-Benefit-Analysis

Economic valuation of ecosystem services as a chance to improve conservation status?

- **Therefore, be careful to beleive with money values we improve the conservation status!**

  => Many values are not easy or not possible to assess

  => A full Cost-Benefit-Analysis can still mean that the destruction of habitats, bycatch of birds, etc. can have a higher benefit/cost ratio than any other measure

  => We need still a societal/political agreement to preserve species and habitats

Summary and Outlook

- **Improving situation of several commercial fish stocks in the North Sea**
- **Problem: Recovery programs mean short term losses against long term gains**
- **Still high negative external effects on the ecosystem => increasing awareness and actions to reduce them**
- **Problem: Short term costs without long term gains in many cases and different regional measures may lead to competition problems**
- **Necessary: Discussion on objectives of future fisheries management => e.g. SOCIOEC project**
- **Measures following from that may be different than today‘s**

Summary and Outlook

- **Economic valuation of ecosystem services may not solve our nature conservation problems**

Thank you very much!