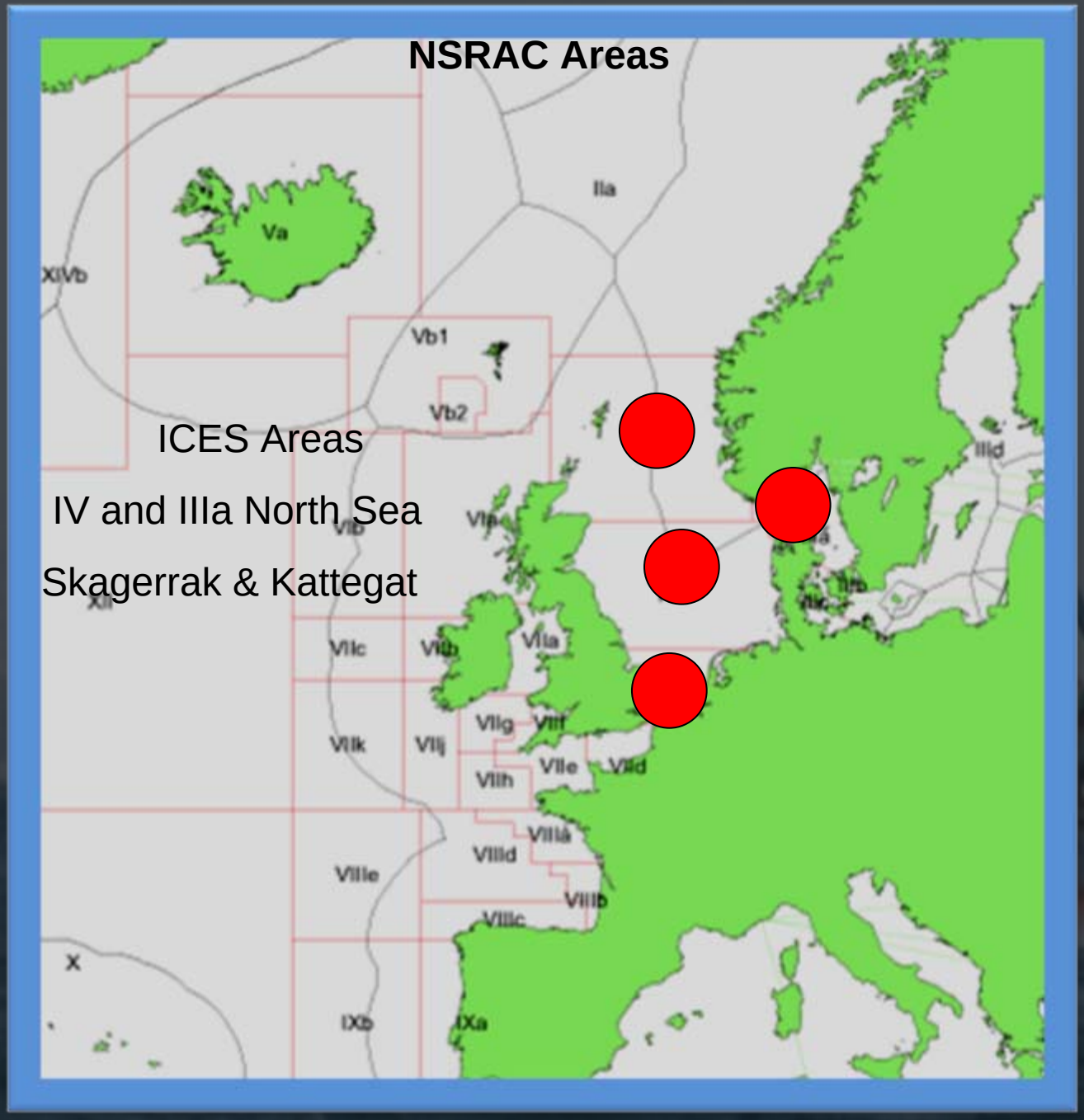
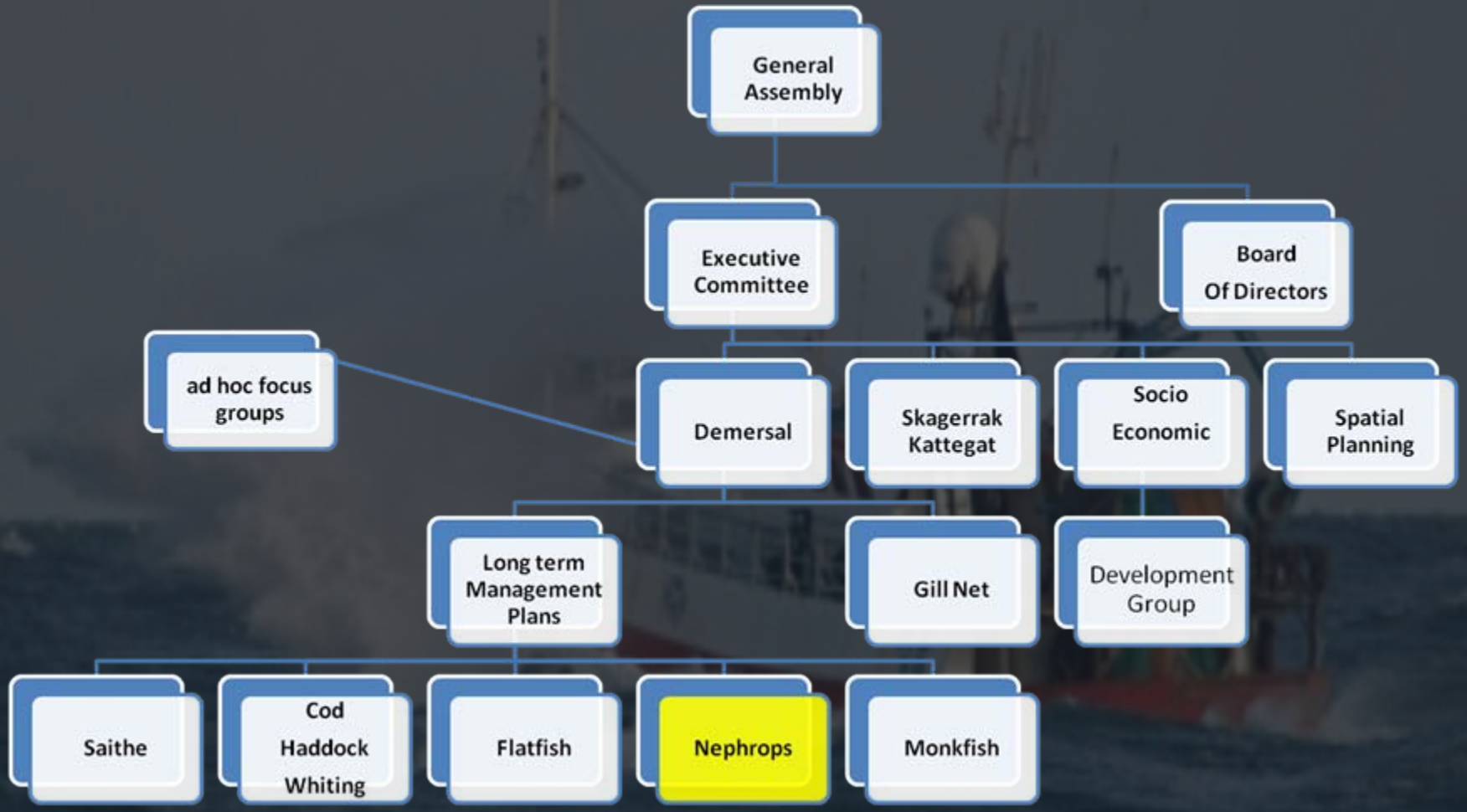
Long Term Management Plans
Nantes 11th-12th September 2008

NSRAC

Nephrops Norvegicus


NSRAC Areas
ICES Areas
IV and IIIa North Sea
Skagerrak & Kattegat
Va
XIIVb
IIa
Vb1
Vb2
IIIa
VIb
VIa
XII
VIIc
VIIb
VIIa
VIIg
VIIf
VIIk
VIIj
VIIe
VIId
VIIh
VIIIa
VIIId
VIIIe
VIIIb
VIIIc
X
IXb
IXa

Structure of the NSRAC



Deep Meeting Development Group

Born 15th June 206

Presentations received from Nick Bailey and Helen Dobby (Fisheries Research Services, Scotland)

- **Information on the characteristics of the stock**
- **Forward looking technology - underwater camera surveys**
- **Traditional stock assessment methods**
- **Functional stock units**
- **Long Term Management of the stock**

Characteristics

- **The animal (Nephrops norvegicus), is found in post glacial soil (around 10-1100 years old)**
- **Discontinuing growth makes it impossible to age the animal; male and females display different behavioural traits**
- **Exposure of the animal to capture is determined by time of day (dusk/dawn) , tide and wind**
- **Interchange of regional populations unknown**
- **Nephrops burrows are semi-permanent**

Underwater Camera Surveys

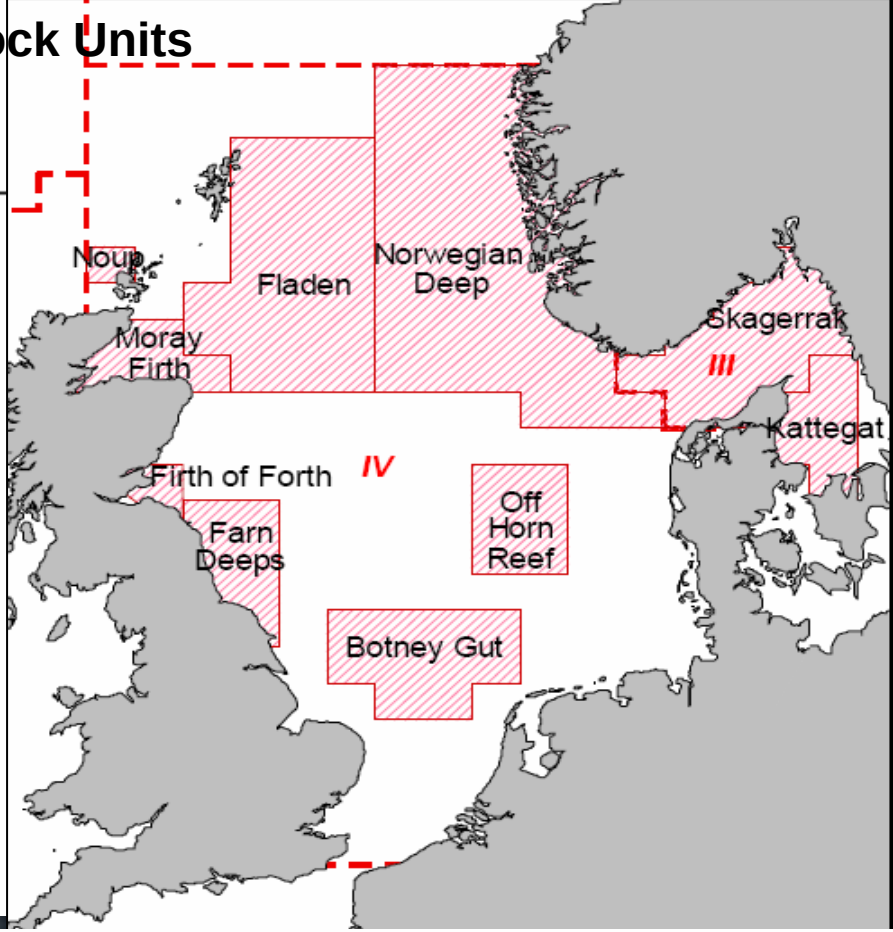
- TV surveys started in the 50’s and were further developed in the 70’s
- Annual surveys have been carried out by FRS since 1992 (pioneers in the field)
- The assessment is based on information ‘provided’ by the sighting and counting of Nephrops burrows while towing a camera.
- Because of the semi-permanent nature of the burrows the counting of animals is of less importance
- Percentage of mud (sediment and clay) is an indicator for distribution and abundance of burrows, but populations operate differently in different areas
- TV surveys may give an amount of additional information and perhaps act as tuning for the analytical model, although some think it provides more than this
- Not all of the functional units have been surveyed

Traditional Stock Assessment Methods

- **Two stages:**
  - **1)Retrospective analyses to theoretically reconstruct the size of the stock biomass and estimate fishing mortality.**
  - **2)Forward predictions of catch and stock size using best estimates of future mortality and biology.**
- **Modelling of this kind is hampered by , amongst others, analyses of landings, estimates of effort, LPUE, and mean size**
- **This type of modelling hasn't provided the answers to stock assessment yet, although analyses show there is no decline in the larger animals, despite increased fishing effort**
- **The analytical approach would only be feasible if further information was known about the biology of the animal**

Functional Stock Units

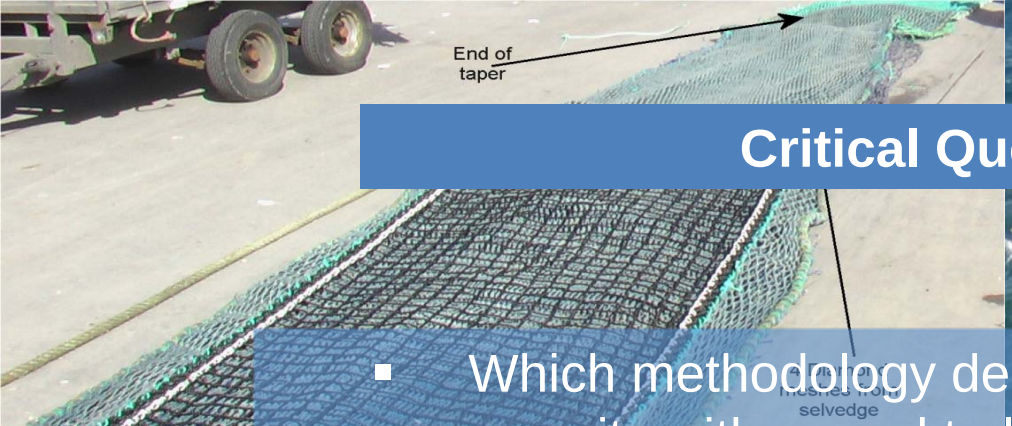
Name	ICES area	Statistical rectangles
Moray Firth	IVa	44-45 E6-E7; 44E8
Noup	IVa	47E6
Fladen Ground	IVa	44-49 E9-F1; 45-46E8
Norwegian Deep	IVa	44-52 F2-F6; 43F5-F7
Farn Deeps	IVb	38-40 E8-E9; 37E9
Firth of Forth	IVb	40-41E7; 41E6
Botney Gut - Silver Pit	IVb,c	36-37 F1-F4; 35F2-F3
Off Horn Reef	IVb	39-41E4; 39-41E5



Current management of *Nephrops* in Subarea IV (both in terms of TACs and effort) does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in Functional Units. In the current situation catches can be taken anywhere in the ICES Subarea and this could imply inappropriate harvest rates from some parts. More importantly, vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way. This appears to have been a particular problem in the Farn Deeps in 2006 where increased vessel activity from other parts of the UK occurred. An overriding management consideration for these stocks is therefore that management should be at the Functional Unit rather than the ICES Subarea level. Management at the Functional Unit level could provide the controls to ensure that catch opportunities and effort are compatible and in line with the scale of the resources in each of the stocks defined by the Functional Units.

Long Term Management of the Stock

- **The absence of reference points and management objectives makes it difficult to reconcile adequate measures with suitable objectives**
- **In the absence of surety, of what MSY actually is in Nephrops, it is difficult to balance the World Summit for Sustainable Development (WSSD) resolution to "maintain or restore stocks to levels that can produce MSY**
- **Managing the components as separate units with separate TAC's , would give added protection**



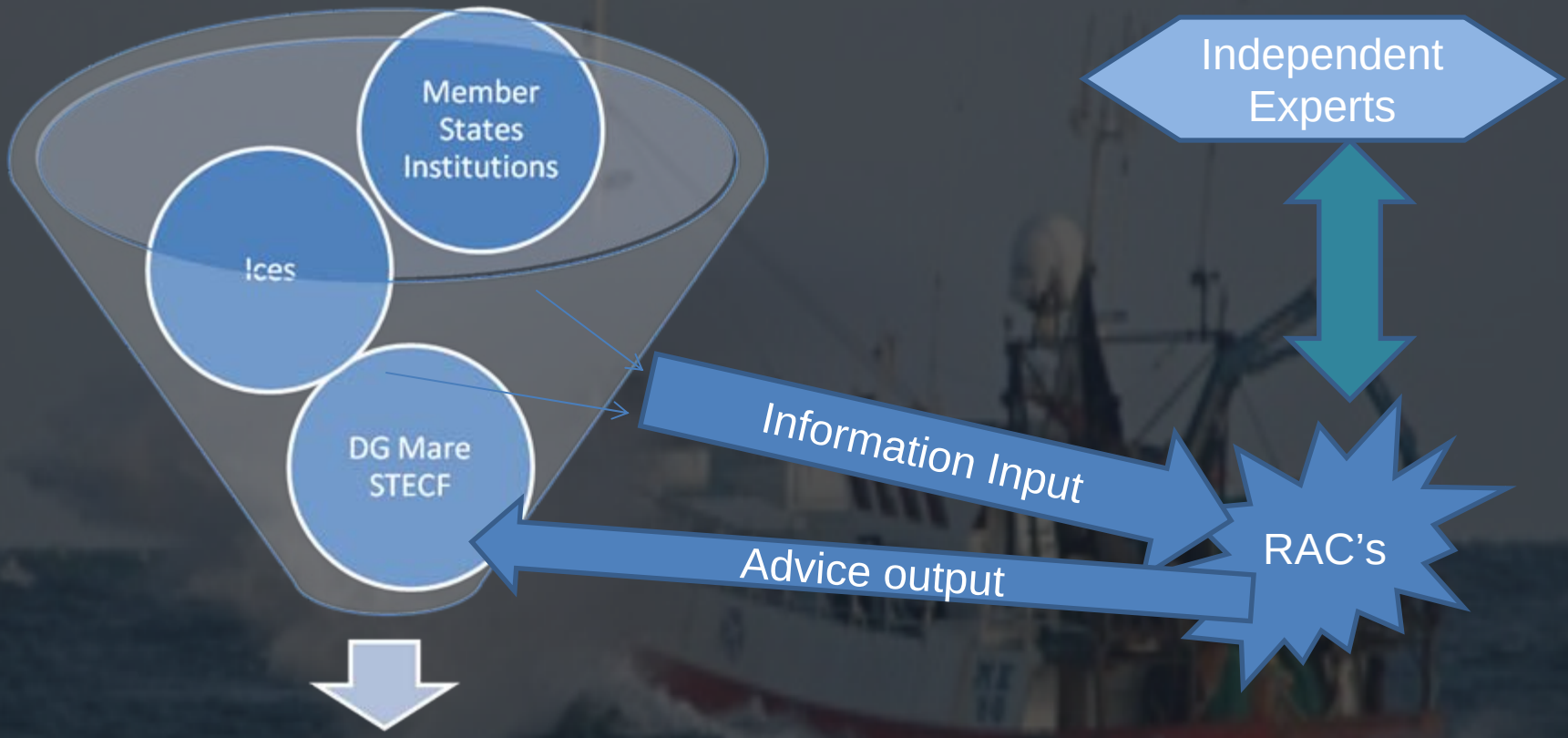
Critical Questions

- Which methodology delivers the greatest security with regard to long term planning?
- What is the appropriate harvest ratio; are there special circumstances relating to Nephrops? Are MSY and MEY concepts too simplistic and theoretical ?
- Do we require reference points and management objectives to allow us to move on the issue?
- What are acceptable discards?
- Should management of the stock be based on managing each functional units?

Summary so Far!

"MSY already seems too high a level. So therefore MSY has 'progressed' to be the absolute maximum to aim at. The problem remains in translating the output of an agreed long term plan to appropriate TAC's. A simple effort system coupled with a likewise simple monitoring system of reference points used as the beacons for adjustment up or down seems to be the preferred route."

Independent Advice



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