



Key scientific issues on Irish Sea (VIIa) stocks

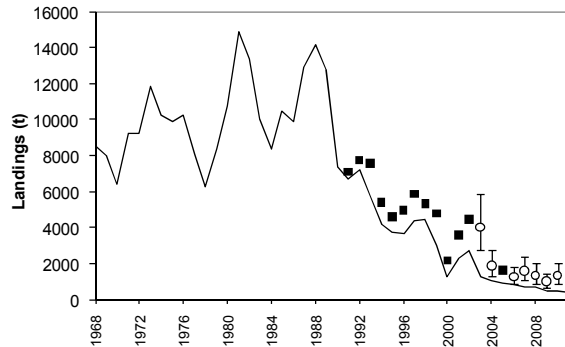
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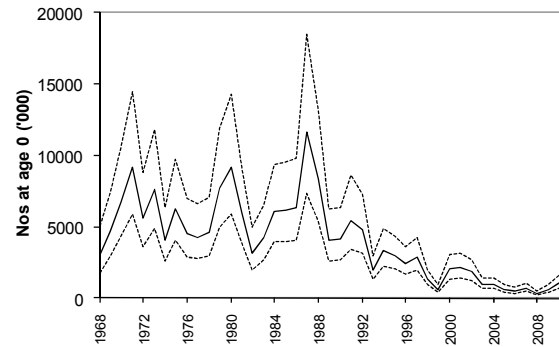
Irish Sea (Division VIIa) Cod



Landings



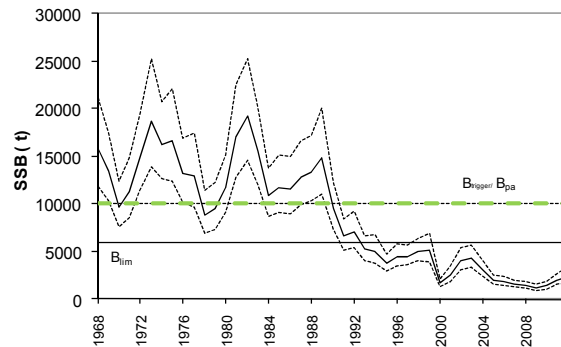
Recruitment



Fishing mortality (age 2-4)



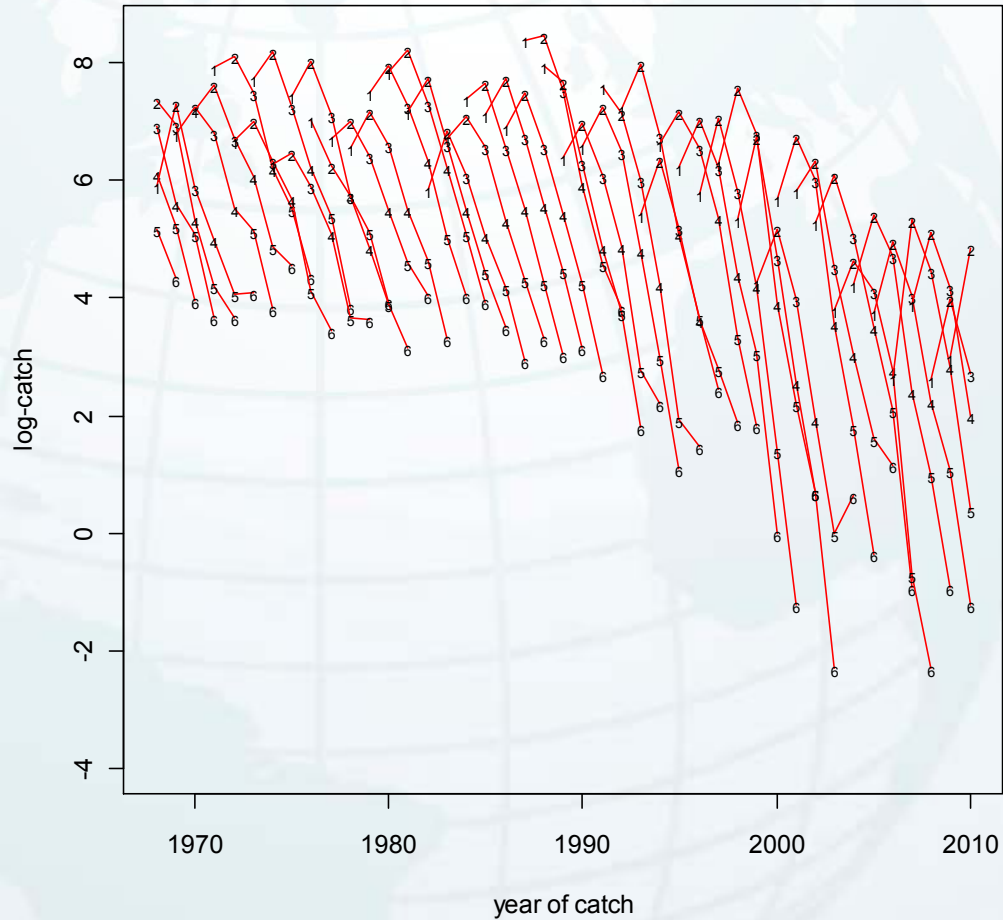
SSB



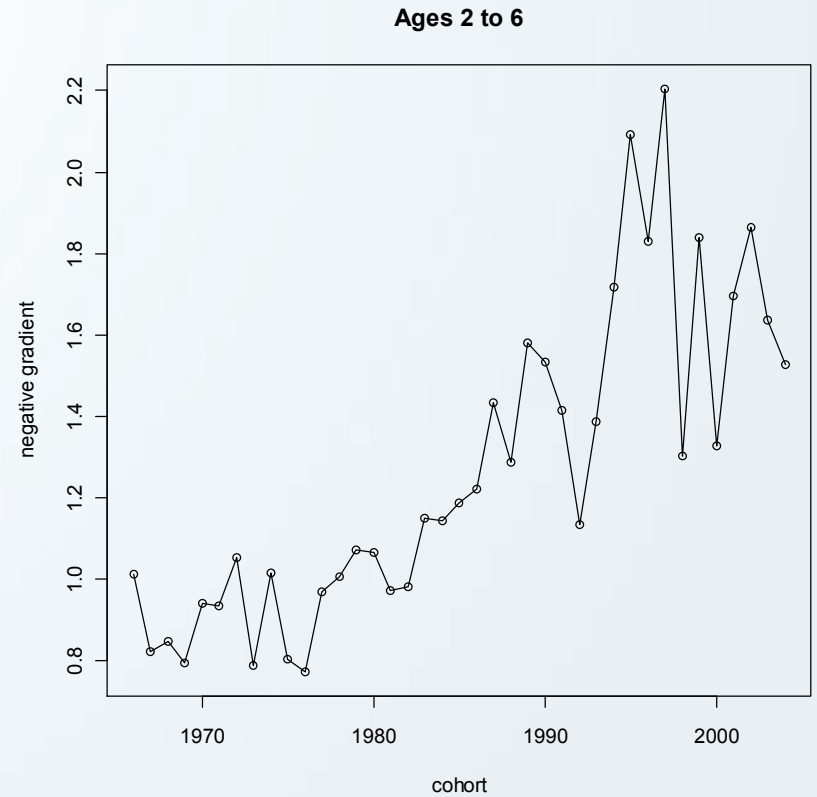
MSY Advice: no directed fisheries, and bycatch and discards should be minimized in 2013 and 2014 (*Zero catch*)

Mortality

Log catch curves

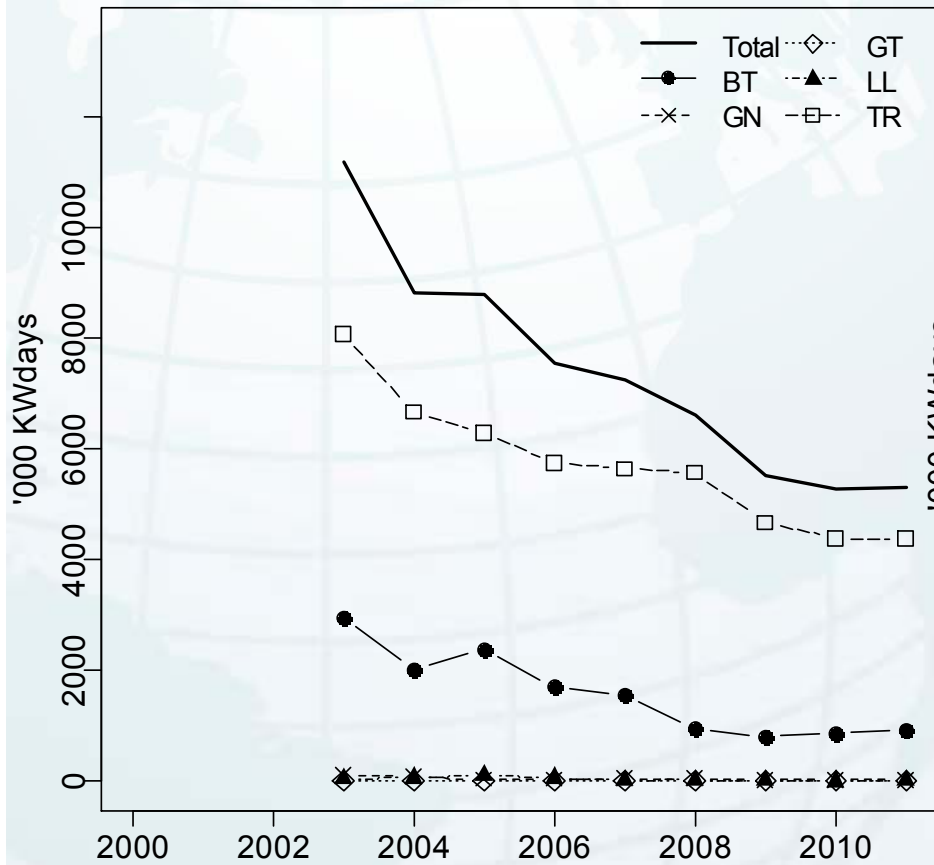


Catch curves gradient

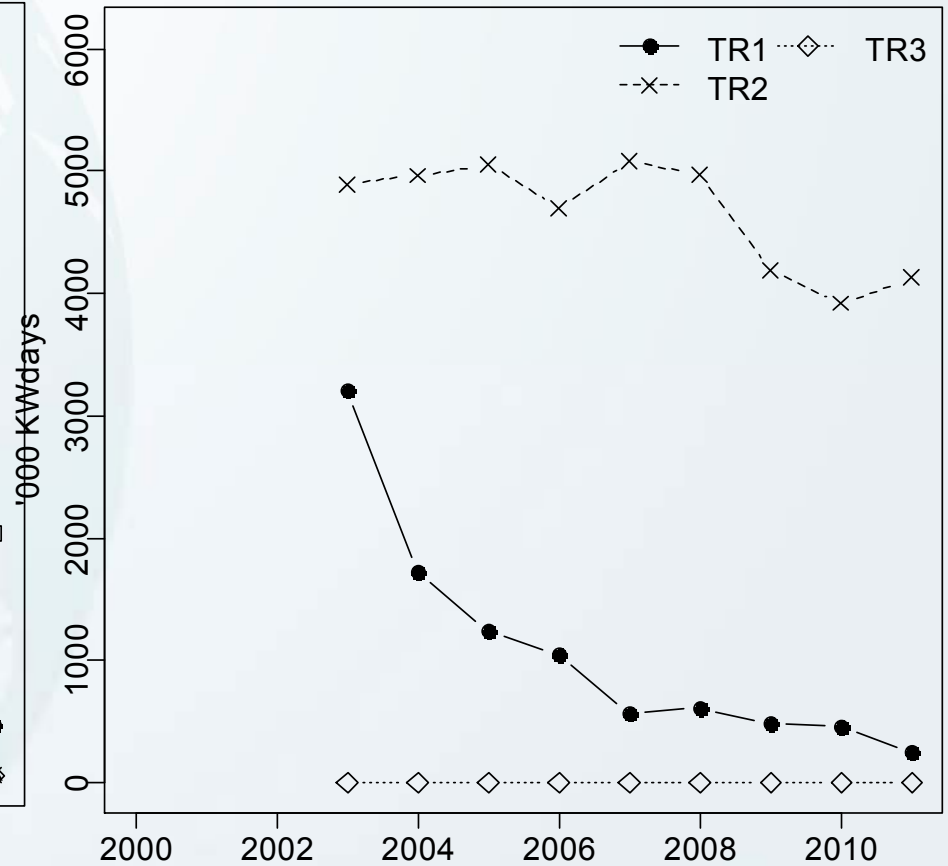


Effort trends

3c, All reg gears, KWdays



3c, Reg gear TR, KWdays

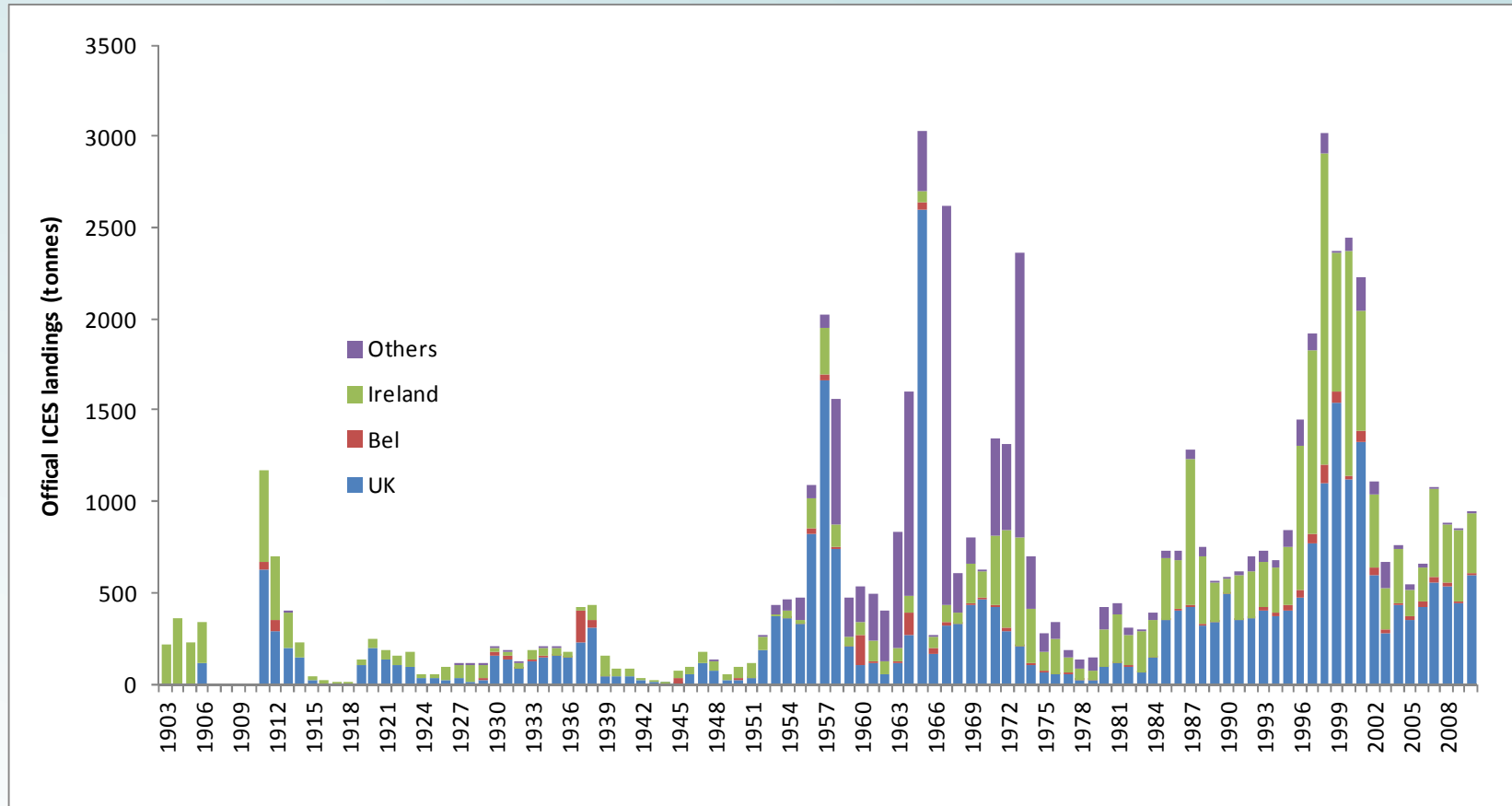


Cod issues

Large amount of data sources

- *Recruitment*
 - Stock recruit dynamics different at lower stock size
 - Climate/environmental effect
- *Mortality*
 - Natural vs fishing
 - Identifying and quantifying sources of mortality
 - Tagging study

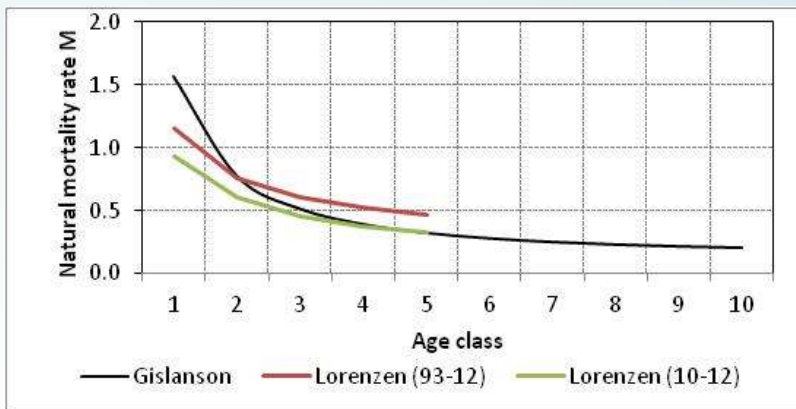
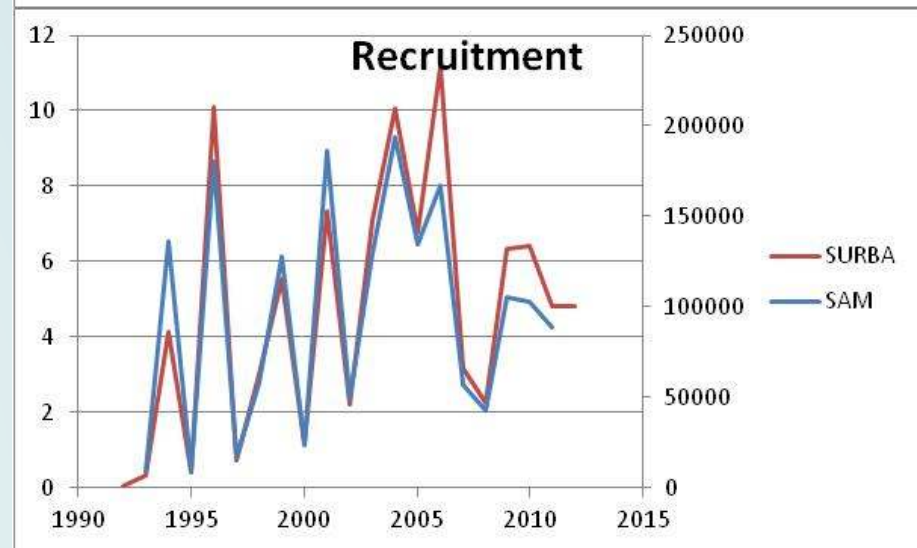
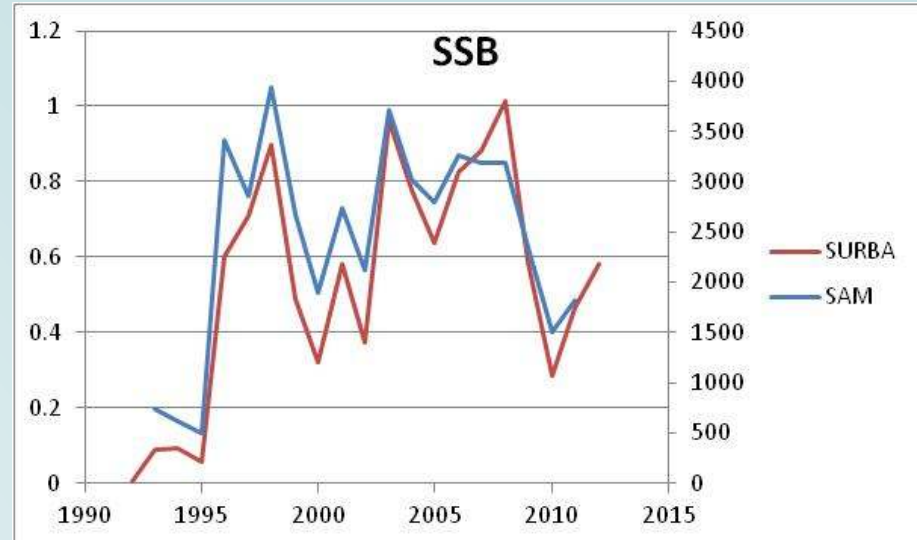
Irish Sea (Division VIIa) Haddock



Irish Sea (Division VIIa) Haddock

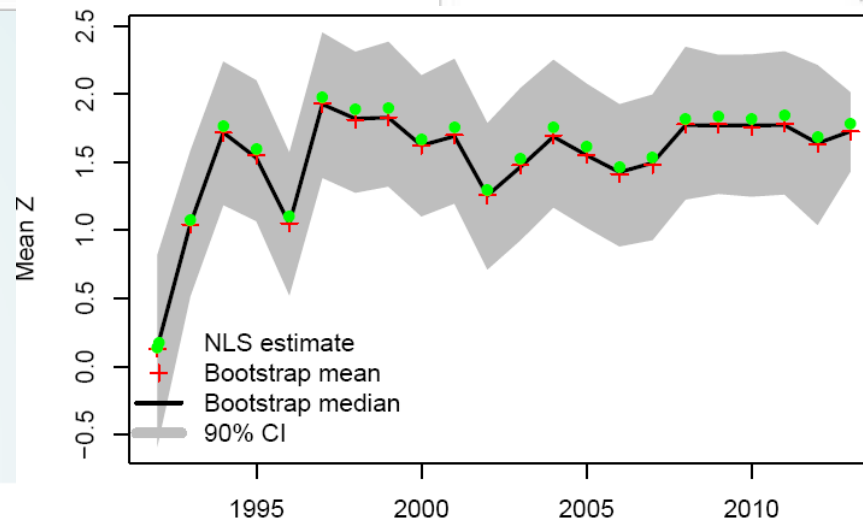
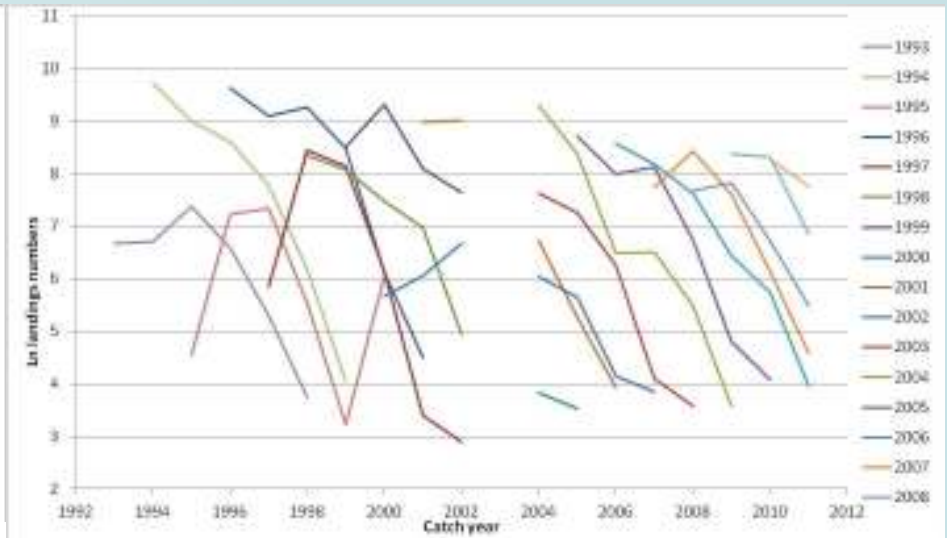
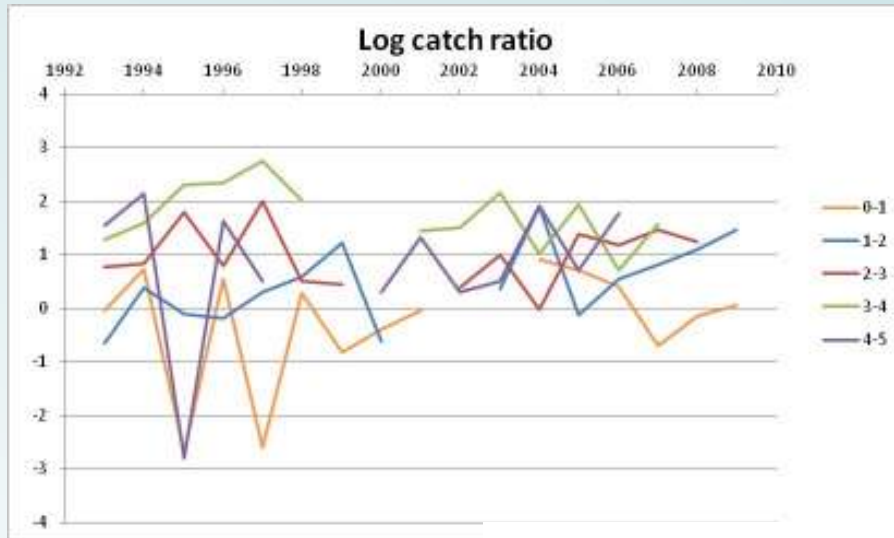


- Discards
- Spatial patterns
- Maturity trends
- Natural mortality
- Effort trends



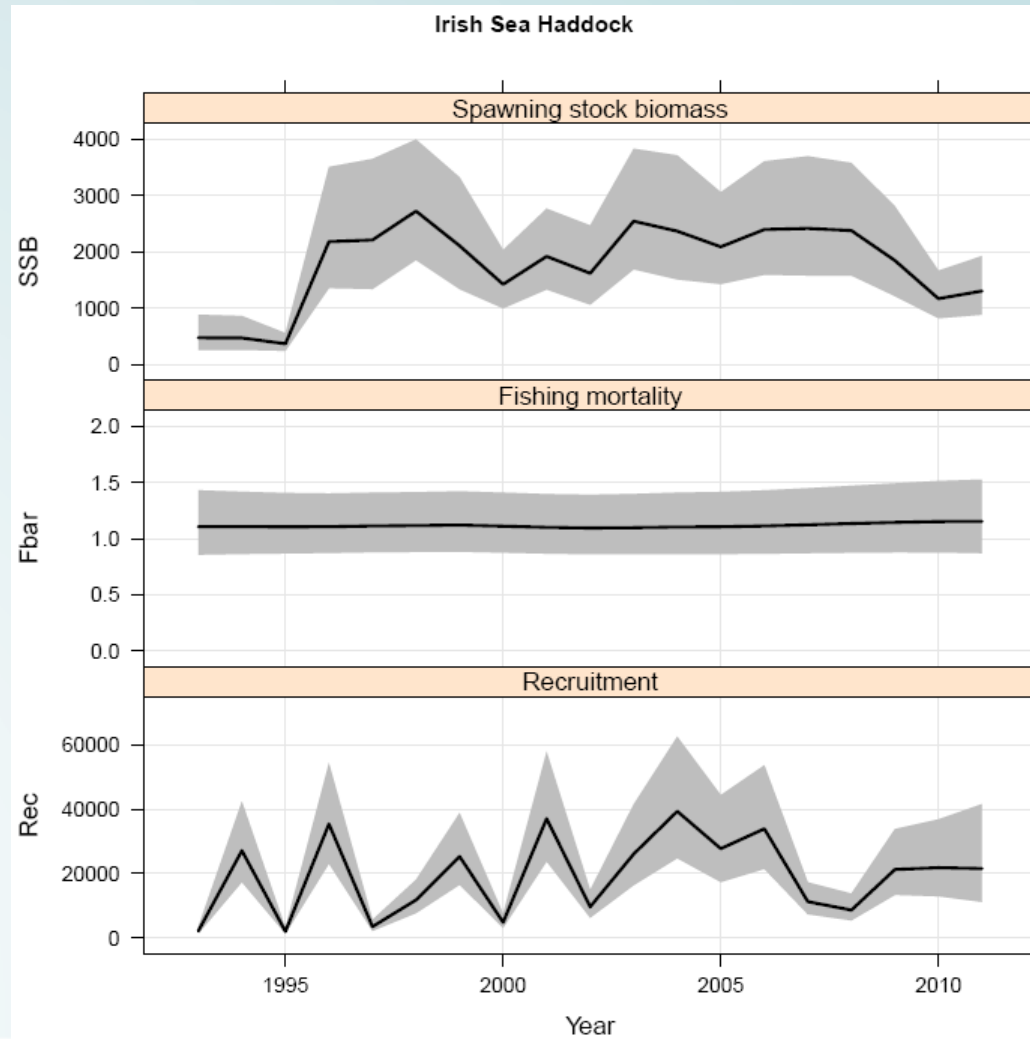


Mortality trends....

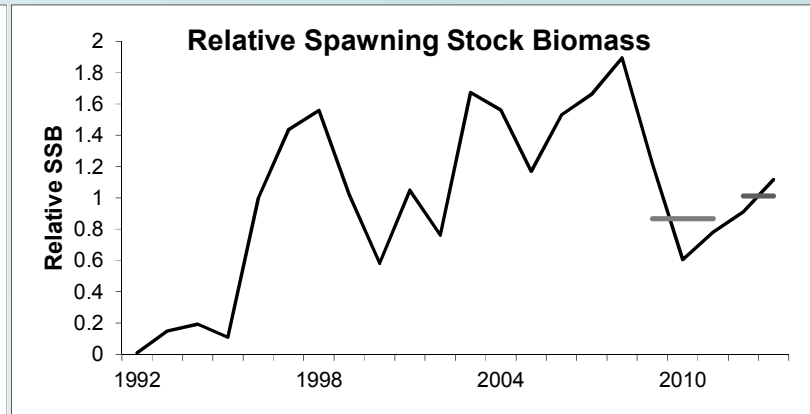
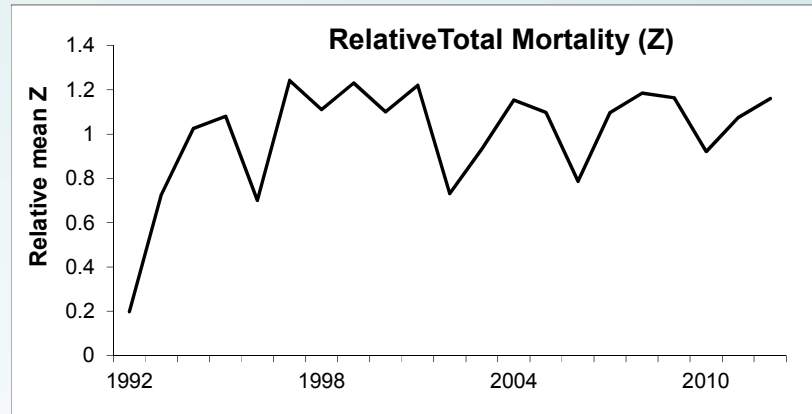
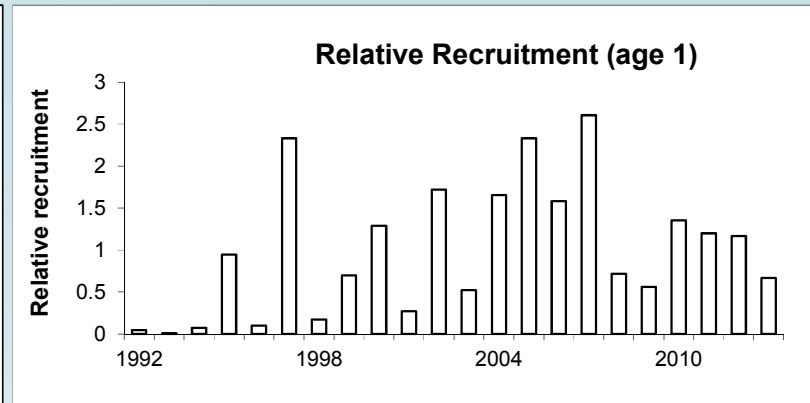
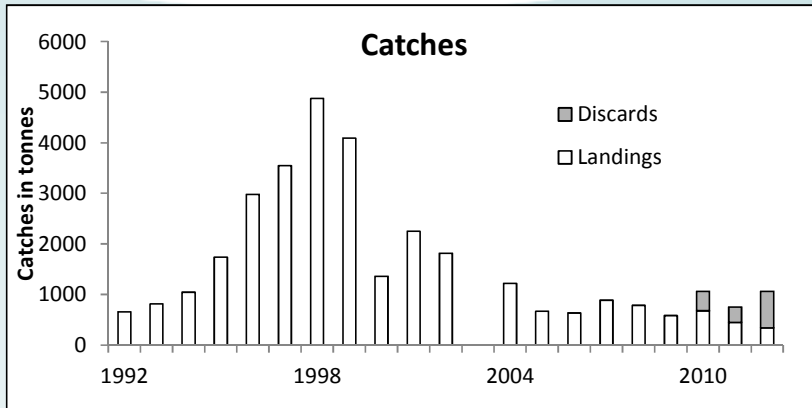




Mortality trends....



Irish Sea (Division VIIa) Haddock



Trends based, but survey considered as good indicator of trend in stock abundance

Data deficiencies for single stocks

- *Nephrops* (FU14&15)
- Cod
- Haddock
- Plaice
- Sole
- Whiting

Commercial sampling for FU14

Model refinement

Model refinement

Model refinement

....monitor recovery?

....monitor recovery?

Way forward....

- Key principles of CFP reform:
 - Regionalisation
 - Outcome driven

Depends on objectives



Fisheries management concepts

- Single stock
- Mixed fisheries
- Multispecies
- Ecosystem

Progressively more complex, with decreasing predictive capability for setting fisheries management options

Mixed fisheries management

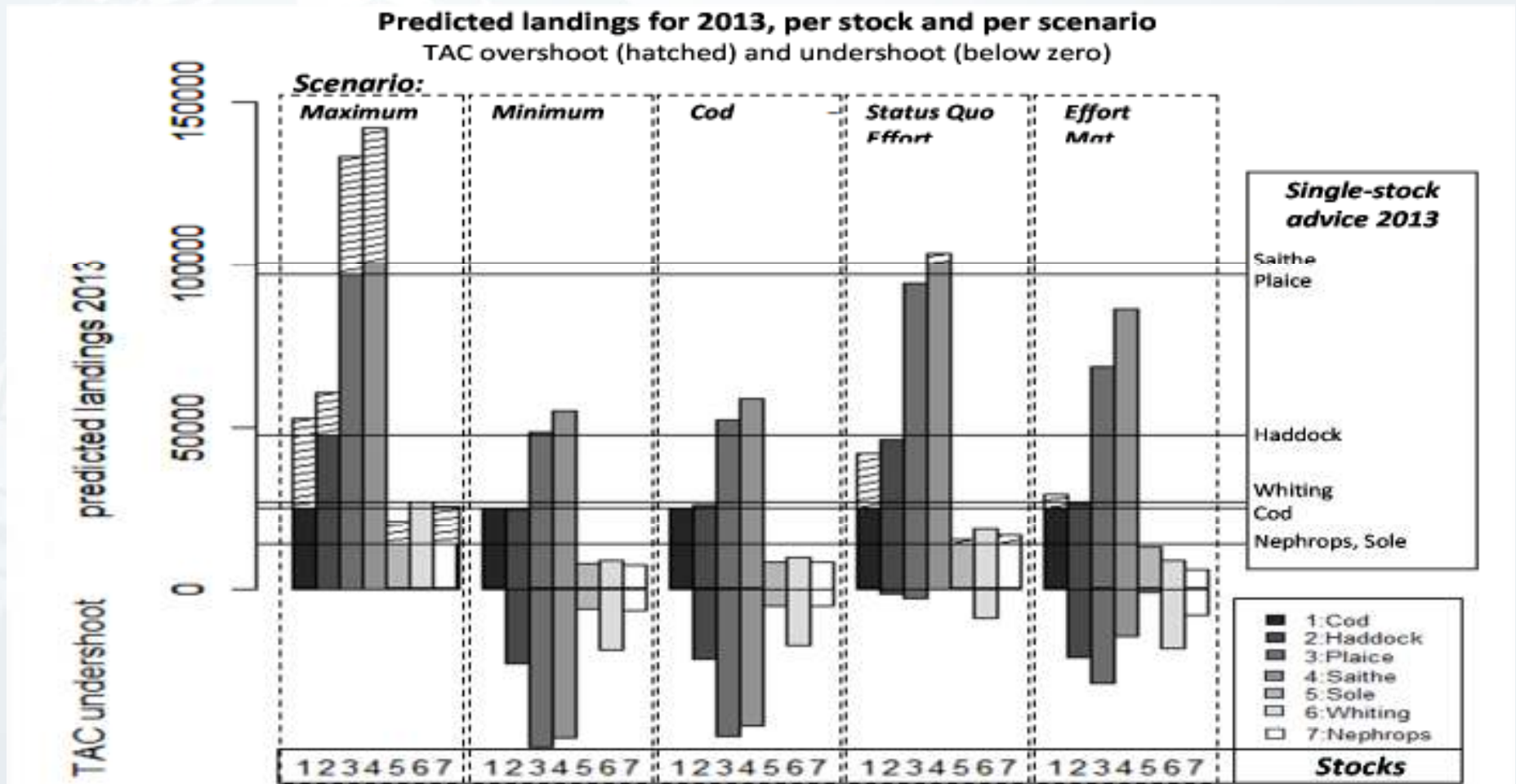
Mixed fisheries – technical interactions

Two approaches

1. Choke species driven
2. Wider technical interaction advice considering spatial and technical effects across species assemblages. More involved approach where a range of options provided – allow stakeholders and managers to explore tradeoffs

Take account of plausible ranges for MSY for main species and precautionary approach for rest – not possible to achieve MSY simultaneously for all species

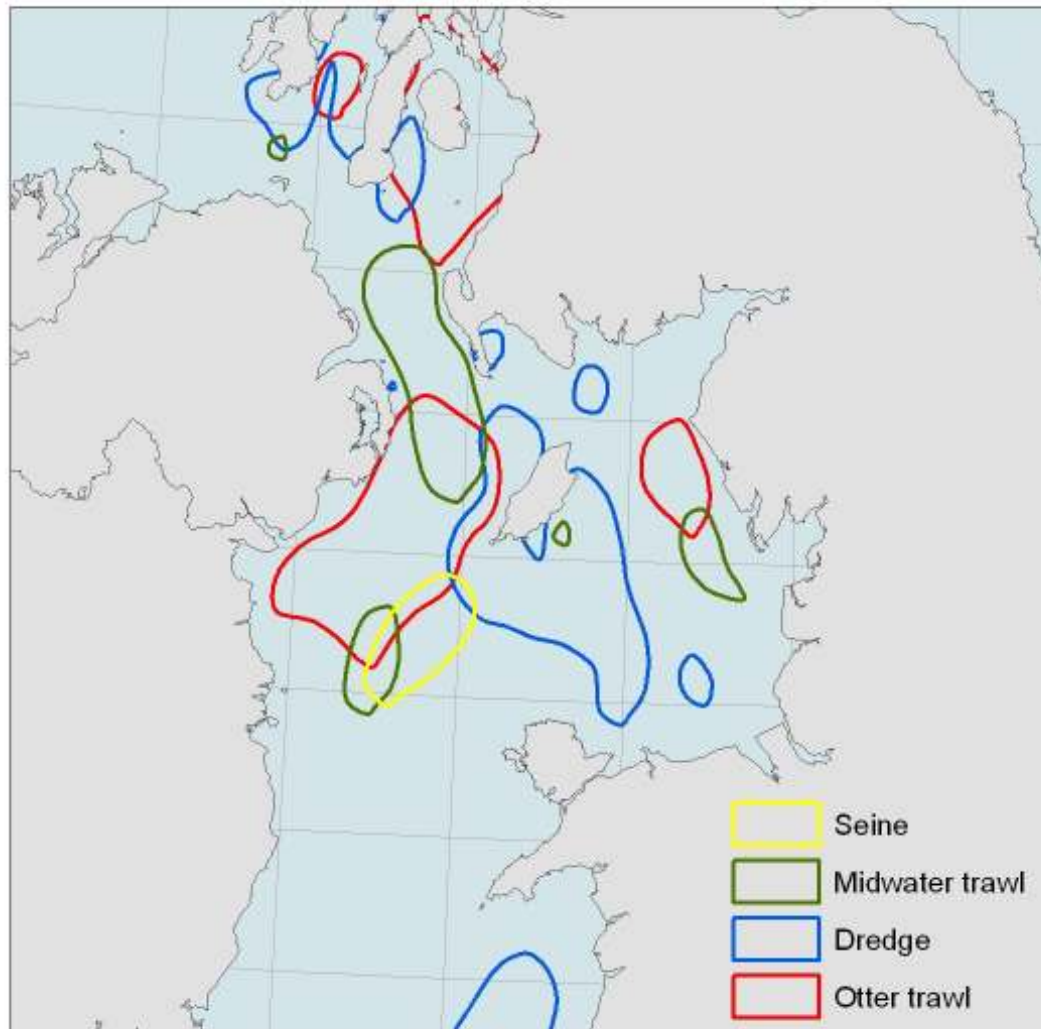
Mixed fisheries



Individual stock objectives can not all be achieved simultaneously

In 2013, the TAC (advice) for cod is the most limiting

Mixed fisheries management

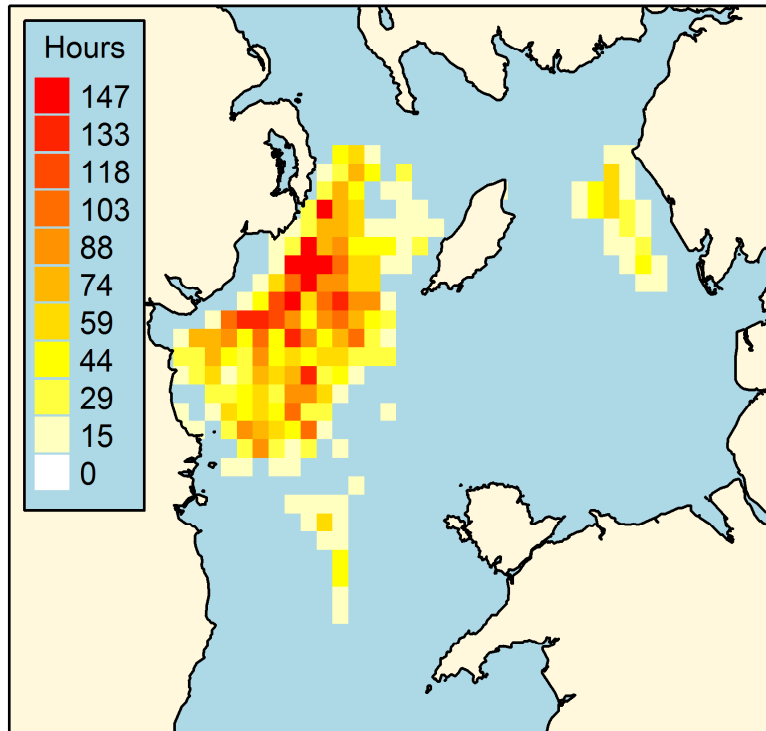


Mixed fisheries management

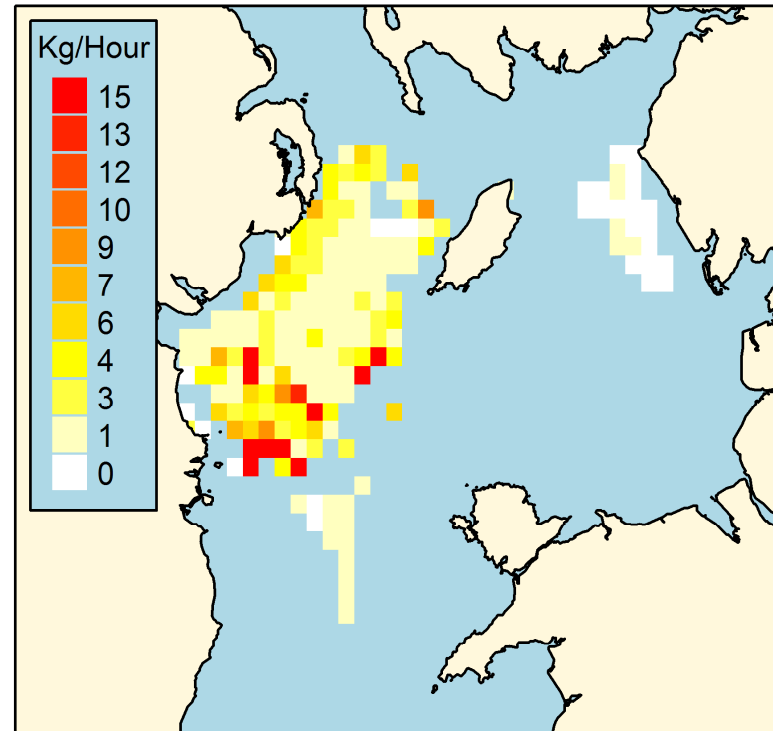


Mixed fisheries management

Observed effort NI + ILR all years



dpue NI + ILR all years





Mixed species management

Mixed species – biological interactions

Understanding of food web and predator-prey interaction

Options:

1. MSY for key stocks
2. Sustainable protein yield from entire ecosystems

MSY typically set lower than single species targets and biomass reference points higher. Both reduce overall impact of fishing pressure.

MSY itself dependent on mix fisheries and multispecies interaction

Ecosystem based management/approach

MFSD and Marine Spatial Planning initiatives strong drivers, but also integral part of the reformed CFP

Means different thing to different people, for example

- Preservationist – dramatically reduce fishing pressure and close large areas of the oceans.
- Fishing communities – sustainability of community as integral goal to fisheries management