Can MPAs Sustain Scallop Fisheries?

THE UNIVERSITY of York

Bryce Beukers-Stewart, Jo Beukers-Stewart
Belinda Vause, Andrew Brand

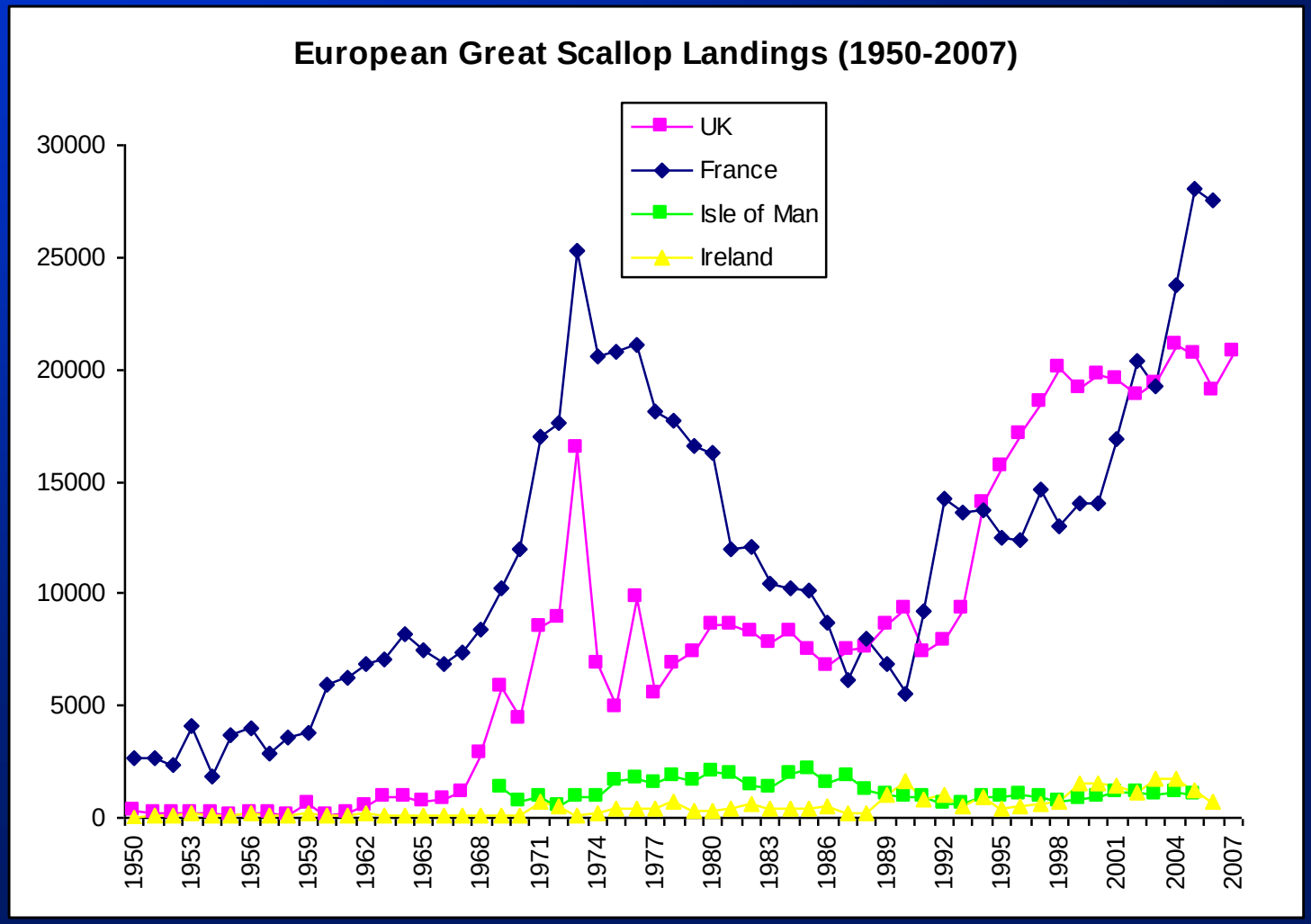
THE UNIVERSITY of LIVERPOOL

Principles for the Management of UK Scallop Fisheries

- Provide an overview of the sustainability and ecosystem effects of UK scallop fisheries (dredge & dive)
- Review successful management measures in scallop fisheries elsewhere in the world

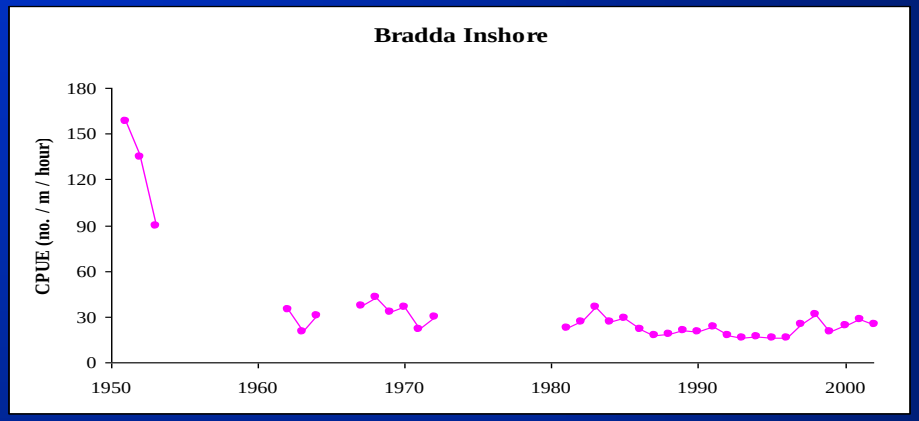
  - *Focus on the role of spatial management (MPAs)*
- Develop principles for improving the management of UK scallop fisheries with respect to productivity, sustainability & ecosystem integrity

Sustainability of UK Fisheries for Scallops

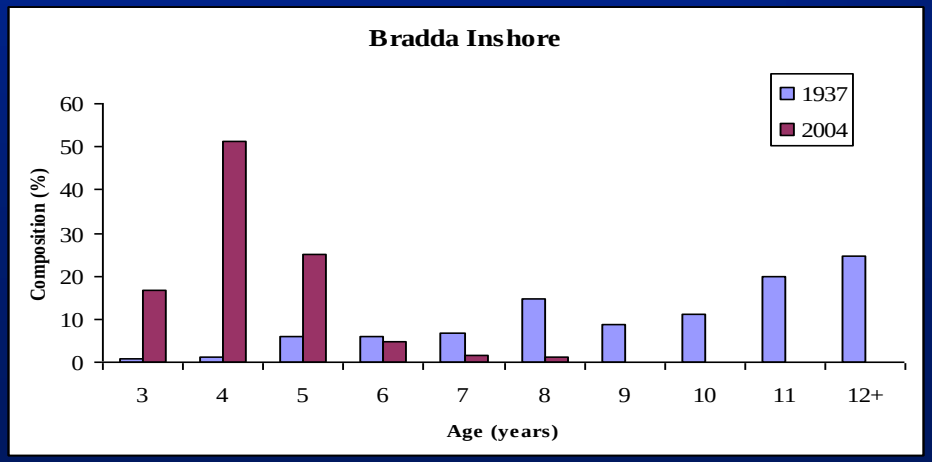


The Effect of Fishing on Great Scallops

Catch per unit effort for scallops



Age composition of scallops



The Effect of Fishing on Great Scallops

Ecosystem Effects of Scallop Fisheries

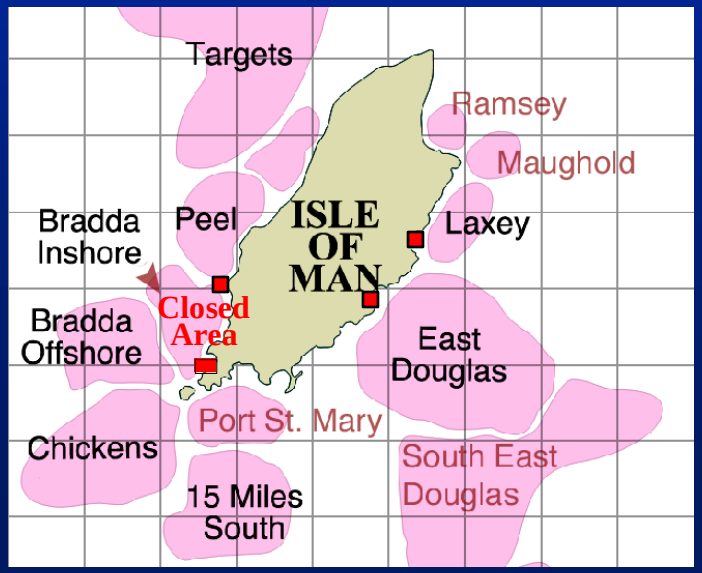
Case Studies of Successful Management
(Healthy ecosystems & productive fisheries)

- Towed gear (7 fisheries) - Canada, North America, Australia (Queensland & W Australia), New Zealand (Enhanced), France, Isle of Man

- Diving (4 fisheries) - Scallops (Argentina), Snails & urchins (Chile, Canada & Tasmania)

- Several of these fisheries were overfished before the introduction of new management measures / schemes (e.g. North American Sea Scallop)

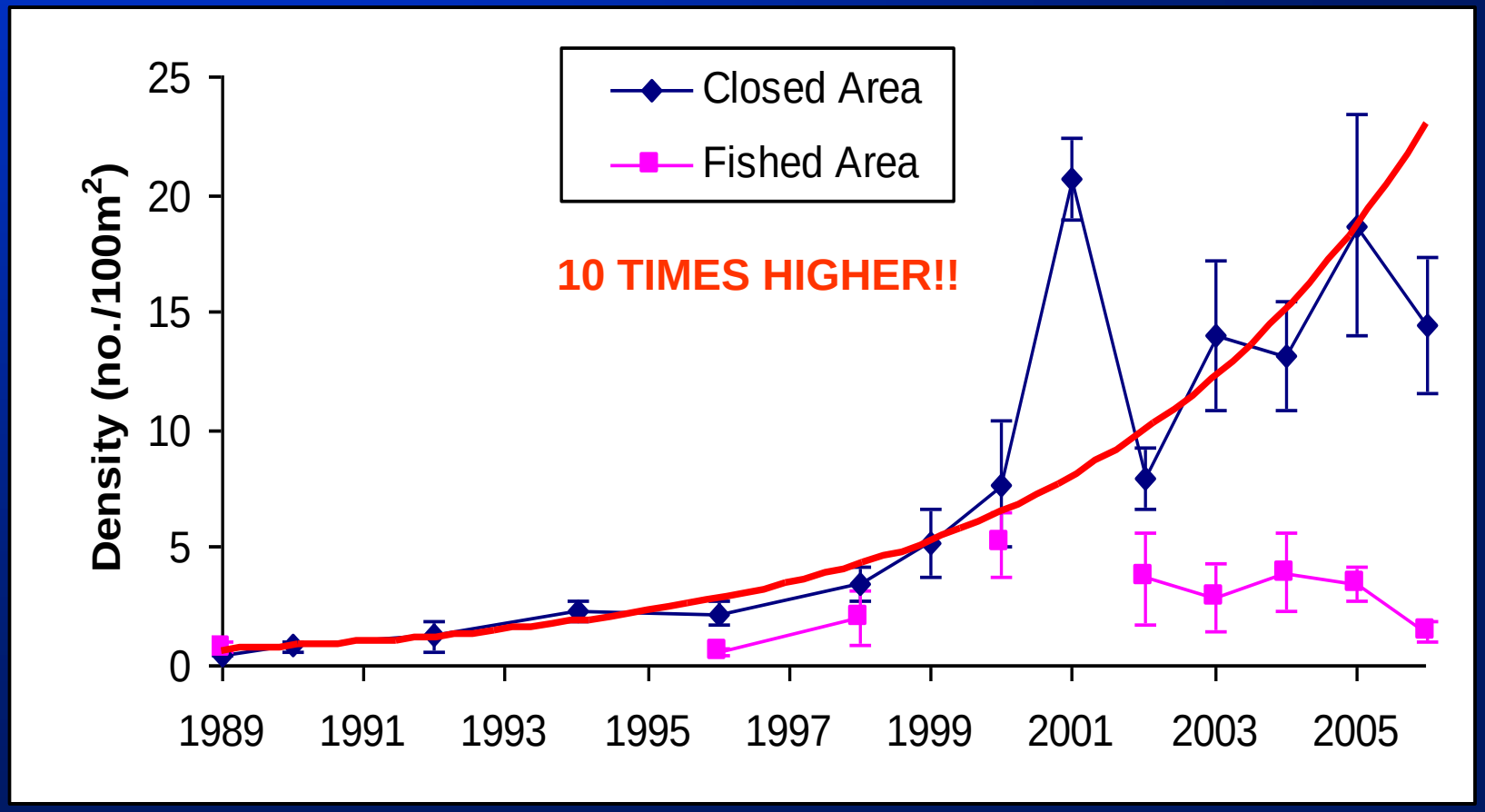
Isle of Man Scallop fishery



- Scallops dominate fisheries landings into the Isle of Man
- Fishery appears sustainable but is much less productive than in the past
- Dredging for scallops has reduced biodiversity & habitat complexity on the main fishing grounds
- IoM have set up a network of marine protected areas to improve fisheries sustainability

Scallop Recovery in Port Erin Closed Area

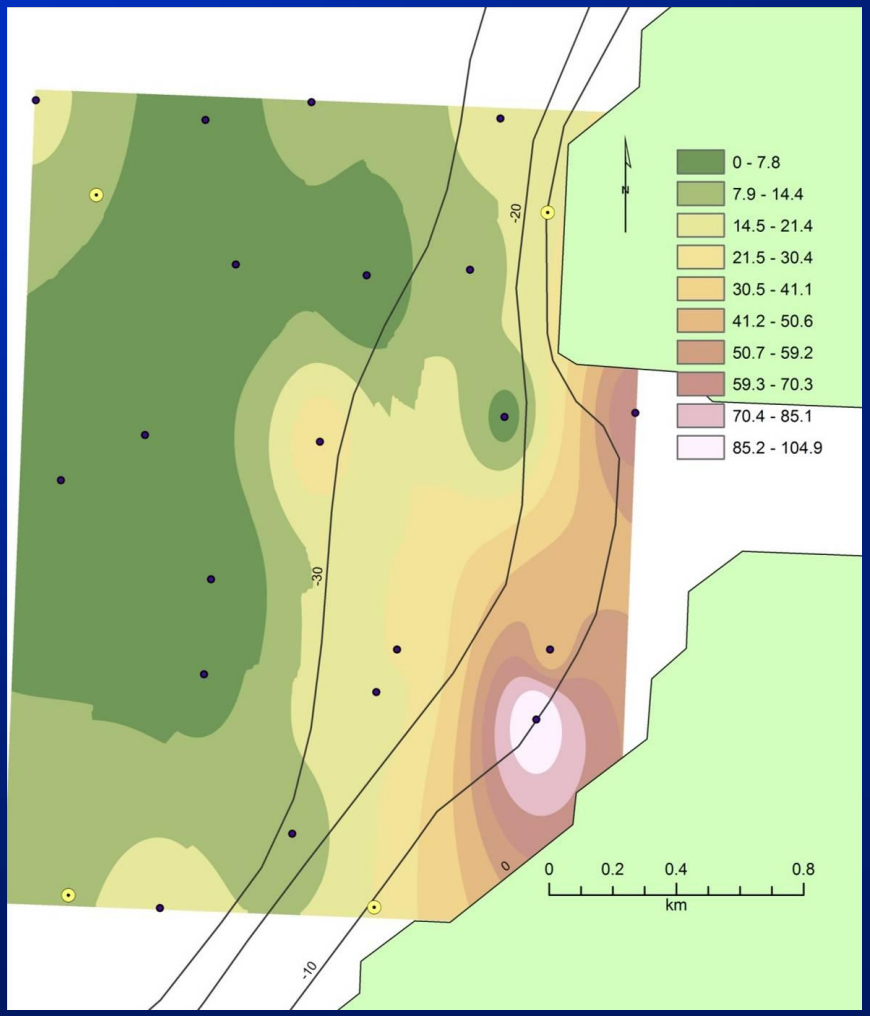
Density (1989-2006)



Beukers-Stewart et al. (2005) MEPS

Scallop Recovery in Port Erin Closed Area

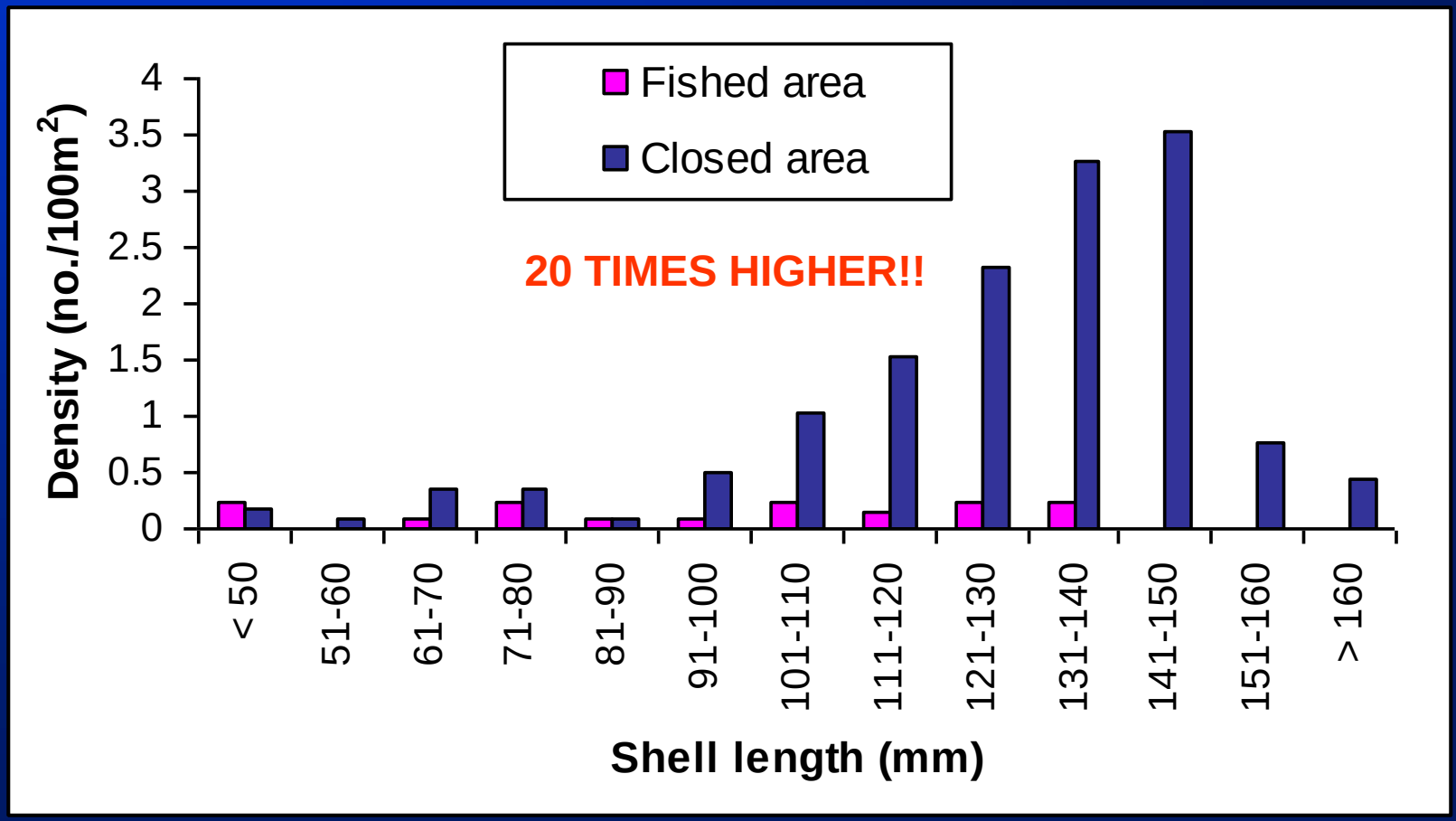
Density (2008)



Murray, Hinz & Kaiser (2009)

Scallop Recovery in Port Erin Closed Area

Biomass (2006)



Scallop Biomass & Reproduction

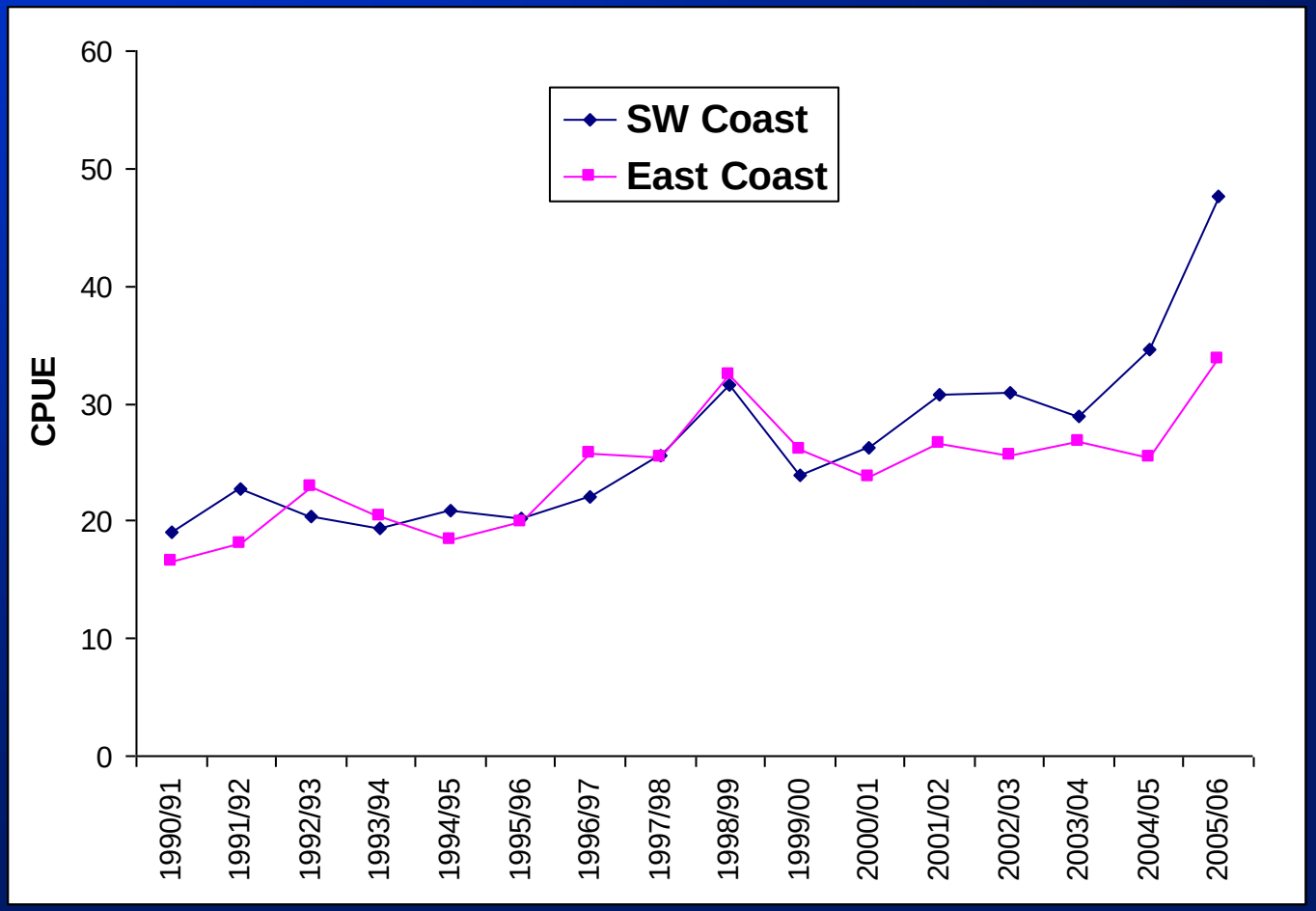
(2006)

Closed area Fished area

- Large scallops ↑
  Egg production
  (33 x fished area)
- High densities ↑
  Fertilisation
- Combination ↑↑
  Larval production
  (100 x fished area?)

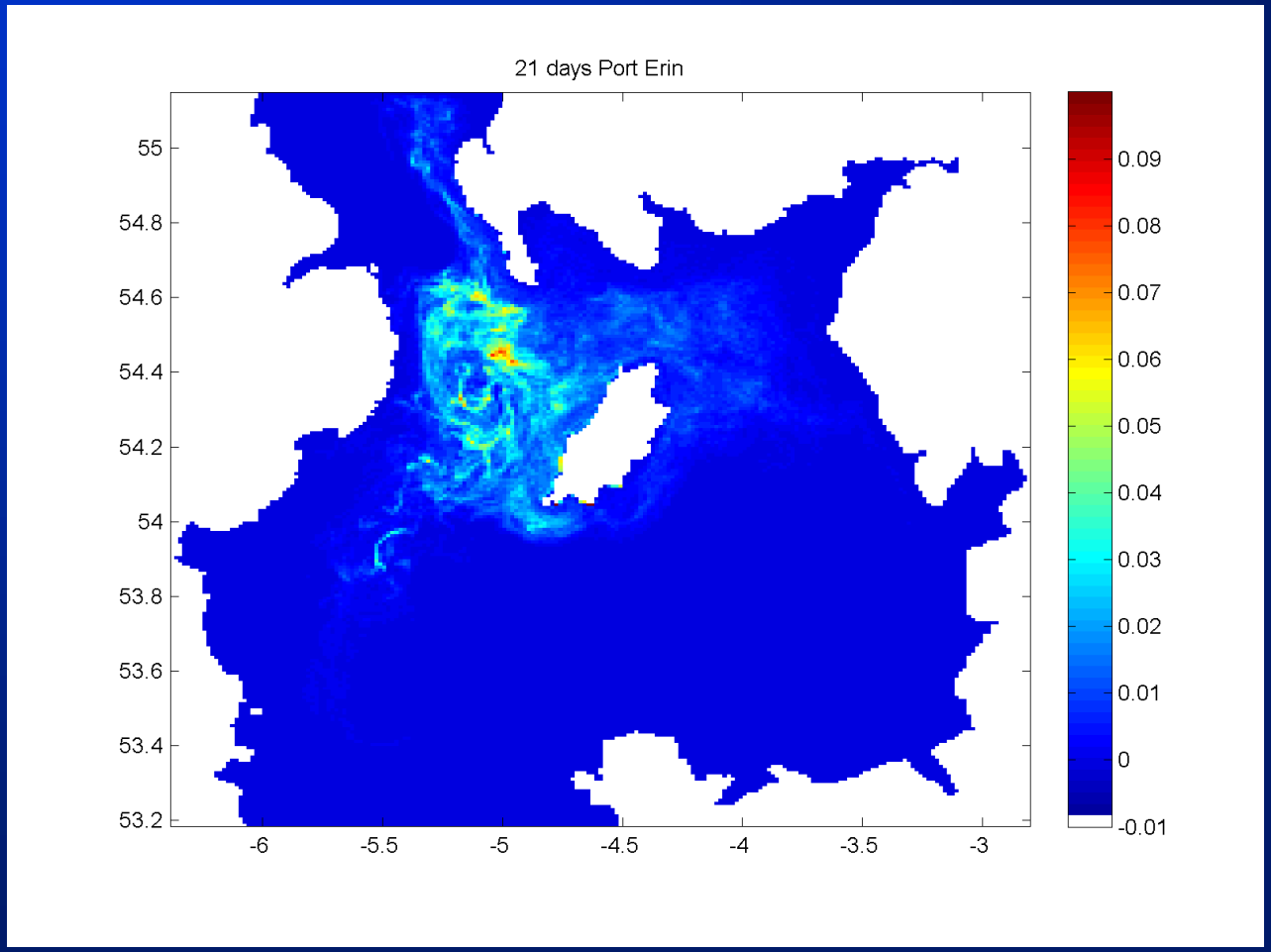
Fisheries Benefits?

Commercial Catch Rates



Beukers-Stewart et al. (2003) ICES J Mar Sci; **Beukers-Stewart** et al. (2006) J Shellfish Res

Hydrodynamic Modelling



Neill & Kaiser (2008) Bangor University

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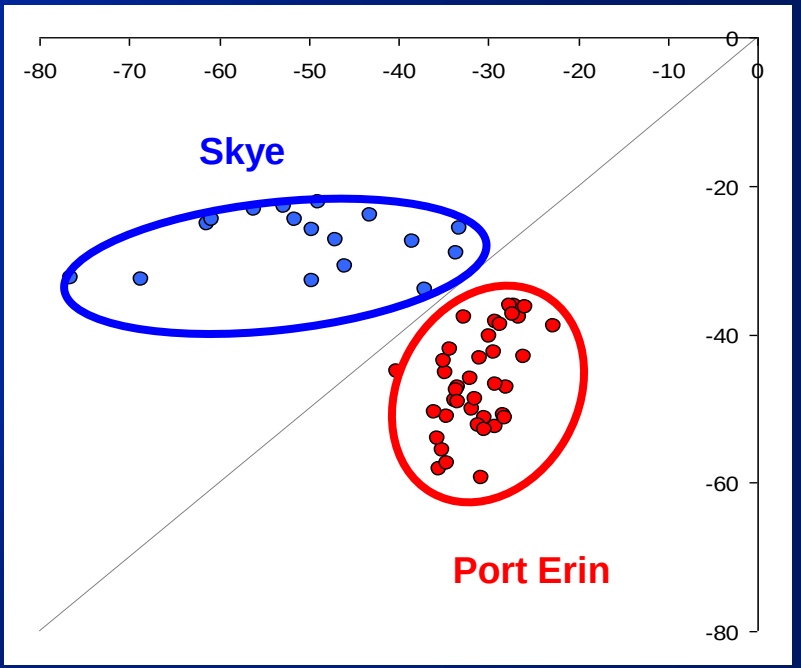
Stock enhancement
A Unique Opportunity

Microsatellite Analysis (Watts et al 05)



- More than 200 000 scallops have now been imported to the Isle of Man
- Microsatellite analysis indicates genetic differences
- Breeding by imported scallops could be tracked to quantify larval dispersal

Principles for Management

1. Encourage industry stewardship of the resource (spatial or catch based ownership) – *reduce the "race for fish"*

2. Allow scallop stocks to recover towards more natural size / age structures – *improve yield per recruit & reproductive output*

3. Provide spawning refuges – *high densities of large scallops*

4. Minimise the effects of the fishery on juveniles – *improve future yields*

5. Reduce by-catch *& conflicts with other fisheries*

6. Reduce the effect of fisheries on benthic habitats – *maintain / recover biodiversity & improve scallop recruitment*

Are MPAs the Solution?

- Scallop fisheries are ideally suited to management with networks of Marine Protected Areas

- BUT… effective management outside MPAs is also essential

- A suite of tools are often needed (e.g. minimum sizes, gear modifications, effort restriction, stock enhancement)
- Mapping of benthic habitats, larval dispersal, fishing activity and resources is key to developing effective strategies
- Co-management or resource ownership will encourage a long-term approach & reduce costs

The Future?

Take an integrated, ecosystem-based approach that considers all stakeholders

Marine Bill / Act - Marine Spatial Planning

0 - 3 miles Reduce dredging & trawling. Zone areas for different priorities e.g. stock enhancement, scallop divers, static gear, biodiversity / scallop protection.

3 – 6 miles Ownership system (spatial or catch based) for the inshore dredge / trawl fleet and the static gear sector. Include areas for biodiversity / scallop protection

> 6 miles Quota (ITQs?) system for the offshore (nomadic) scallop fleet. Include areas for biodiversity / scallop protection

Acknowledgements

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