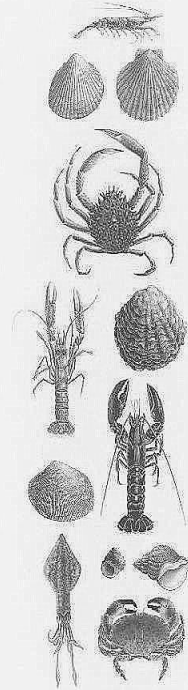


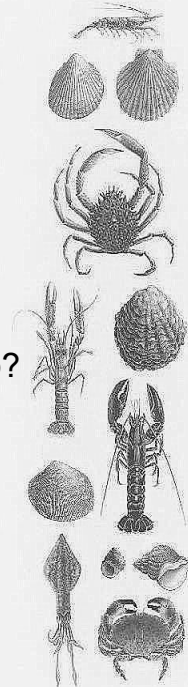
Pot-caught Brown Crab

Dr Tom Pickerell
National Shellfish Development Manager
Shellfish Association of Great Britain



Presentation Outline

- The animal
- The fishery
- What is 'sustainability'?
- How sustainable is pot-caught brown crab?

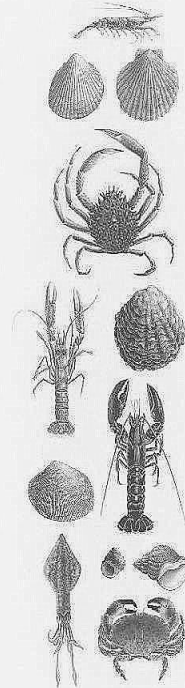


Shellfish Industry Development Strategy

The Animal



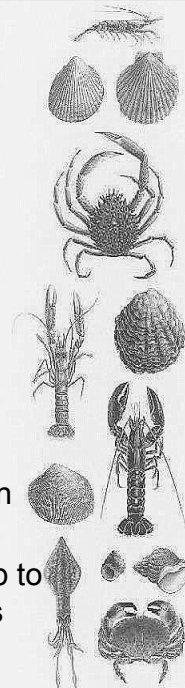
Dressed Crab



Shellfish Industry Development Strategy

The Animal

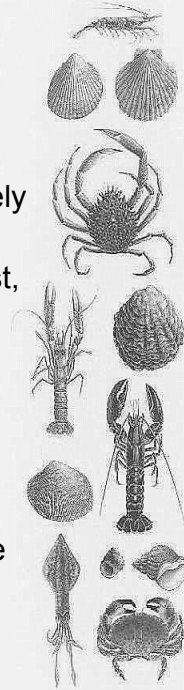
- Grow by casting (moulting) their shell, and then hardening a new shell at a slightly larger size.
- Mature around 120-130mm carapace width
- Mating occurs while the female shell is soft.
- After spawning (late summer or autumn) eggs carried by the female under the abdomen
- Hatch in early summer, planktonic larvae settle in summer or autumn.
- Tagging studies show brown crabs may move up to a few kms a day, and over 100 kms over months



Shellfish Industry Development Strategy

The Fishery

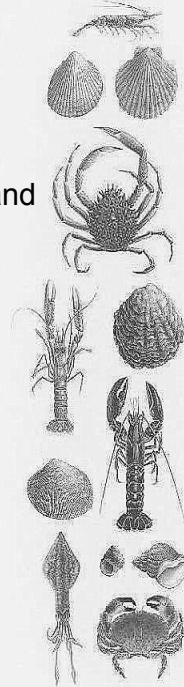
- Brown crabs are widely distributed on soft, gravely and stony habitats.
- The main stocks occur along the north east coast, in the Channel, and along the Welsh coast and West of Scotland.
- Landings come from traditional inshore fisheries plus specialist offshore fisheries off the Humber, West of Scotland, the outer Wash, and in the western mid-Channel.
- Landed around the UK, but the main sources are the east coast, and the south coast and West of Scotland.



Shellfish Industry Development Strategy

The Fishery

- Brown crabs are caught by creels, parlour pots and inkwell pots

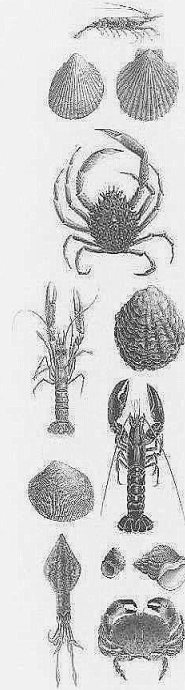


Shellfish Industry Development Strategy

The Fishery

- Historically a small-scale inshore fishery
- Offshore grounds targeted later
- Classed as a *principal capture species* (scallop, lobster, cockle, and Nephrops)
- 21% total volume shellfish landed*
- 26,000 tonnes in 2006*
- Landings worth £34m*

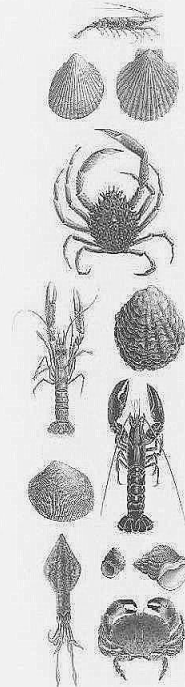
*UK vessels landing in UK



Shellfish Industry Development Strategy

What is 'sustainability'?

- Stock-size sustainability
- Ecosystem sustainability
- Global sustainability

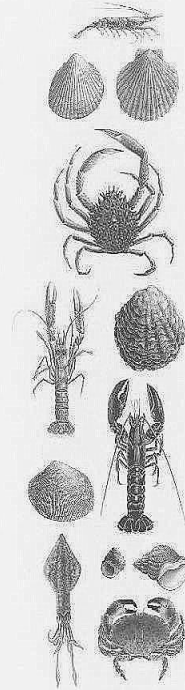


Shellfish Industry Development Strategy

What is 'sustainability'?

- Stock-size sustainability
- Ecosystem sustainability
- Global sustainability

How does pot-caught brown crab rate?

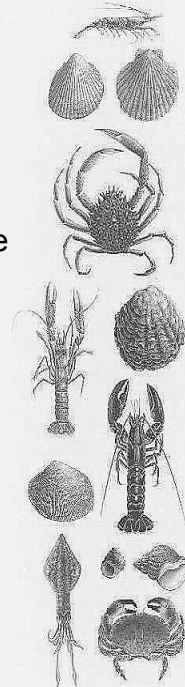


Shellfish Industry Development Strategy

Stock-size sustainability

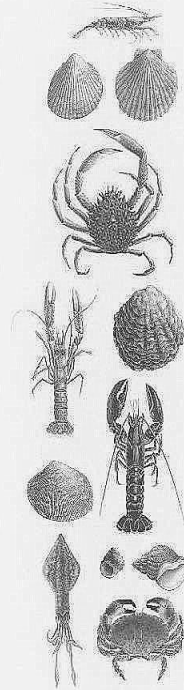
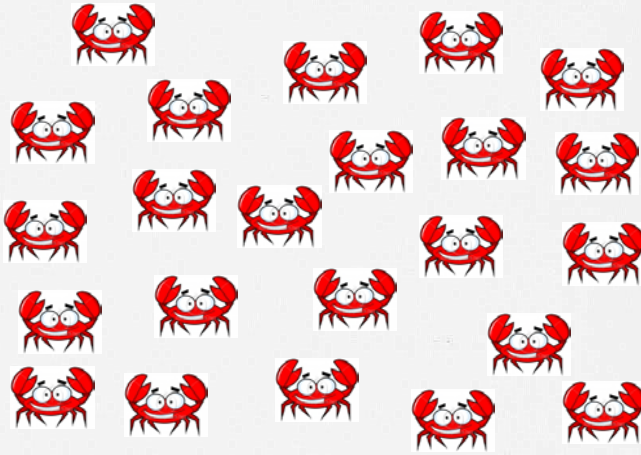
- Based on proportion of the fishery taken from the stock each 'season'
- A 'sustainable' fishery in this example would harvest equal/less than the recruitment the following season*
- Maximum Sustainable Yield (MSY)
- Roughly 30% of stock in general
- Need accurate science – Orange roughy in NZ

* Need to take into account natural mortality



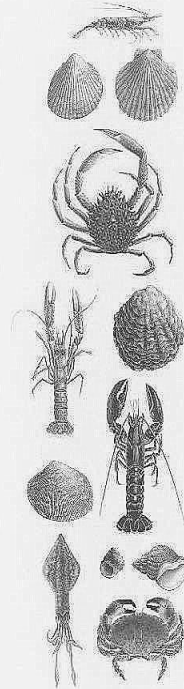
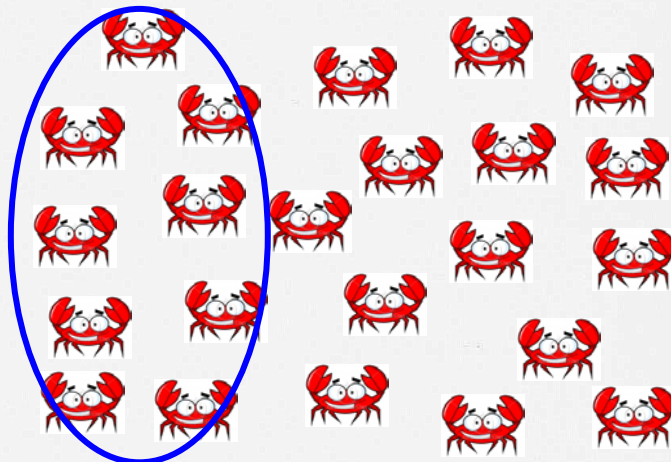
Shellfish Industry Development Strategy

Stock-size sustainability



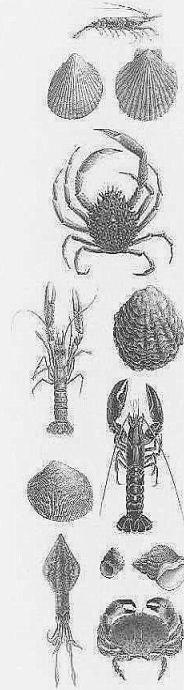
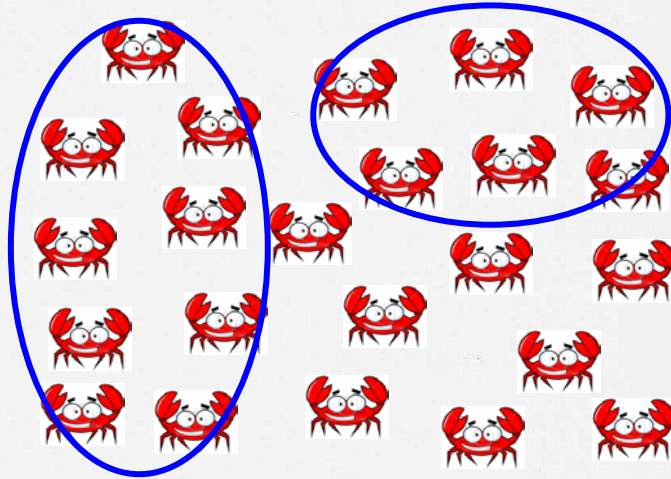
Shellfish Industry Development Strategy

Stock-size sustainability



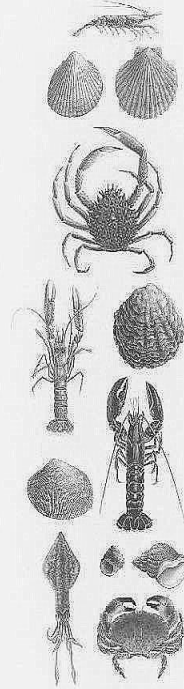
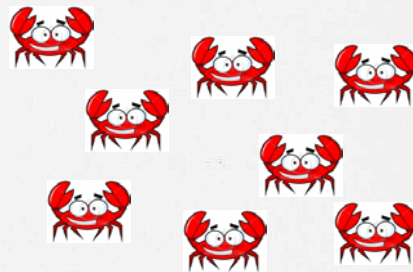
Shellfish Industry Development Strategy

Stock-size sustainability



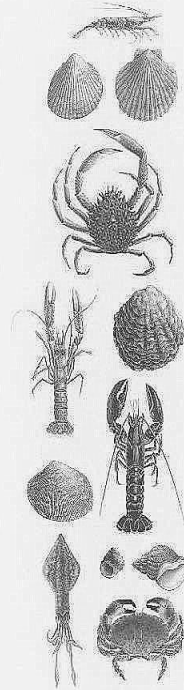
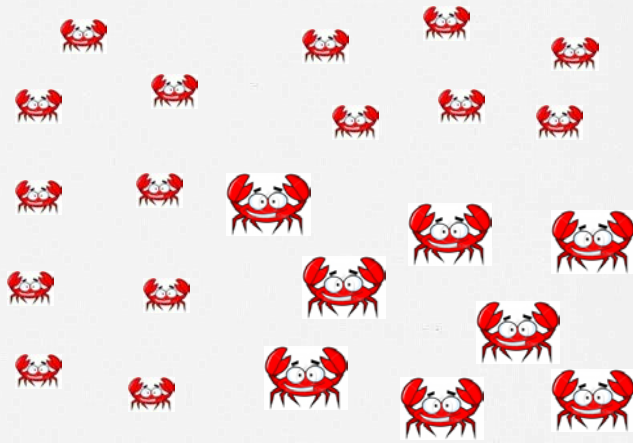
Shellfish Industry Development Strategy

Stock-size sustainability



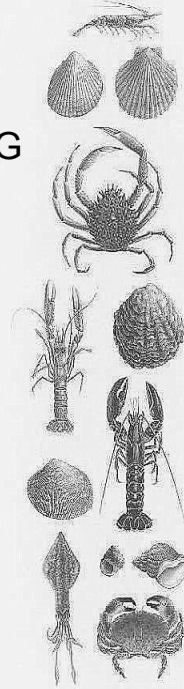
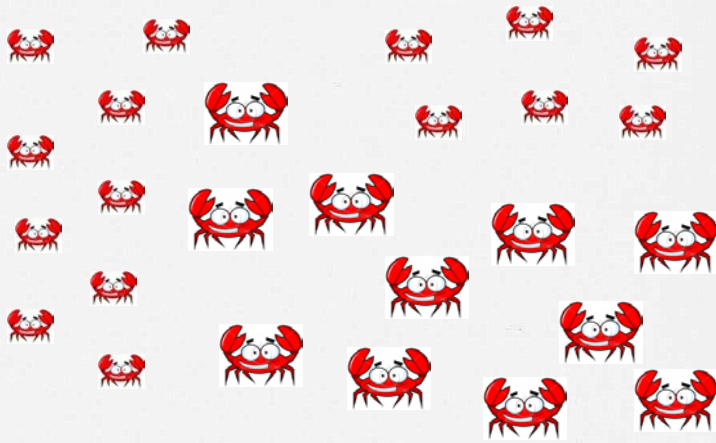
Shellfish Industry Development Strategy

Stock-size sustainability



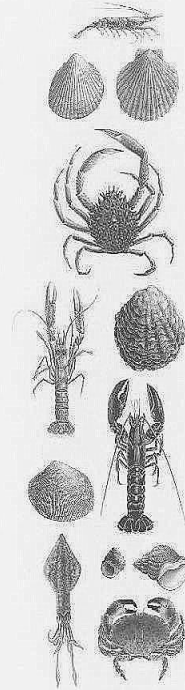
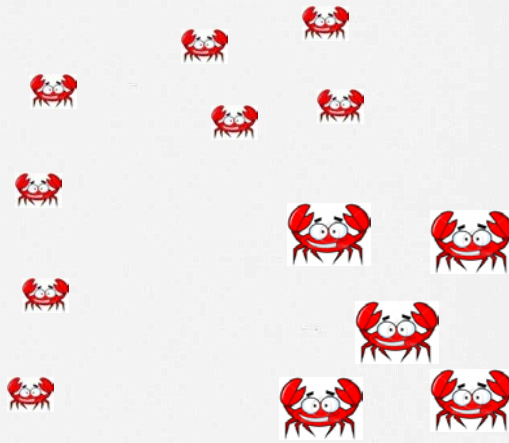
Shellfish Industry Development Strategy

Stock-size sustainability - UNDERFISHING



Shellfish Industry Development Strategy

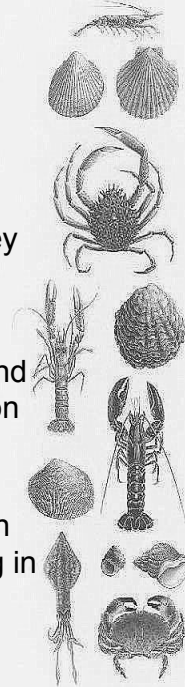
Stock-size sustainability - OVERFISHING



Shellfish Industry Development Strategy

Stock-size sustainability

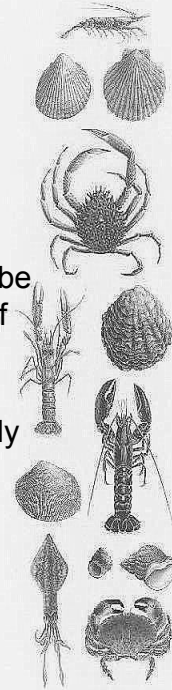
- Unlike most TAC species there is no ICES survey
- Fishing effort data are collected by Defra
- CEFAS collects data from fishers log books
- The Northumberland, North Eastern, Cornwall and South Wales SFCs collect permit scheme data on crab potting effort.
- Crab stocks are assessed by analysing the size distribution of crab landed from the fisheries, with the aid of growth rate data obtained from tagging in the 1970s.



Shellfish Industry Development Strategy

Stock-size sustainability

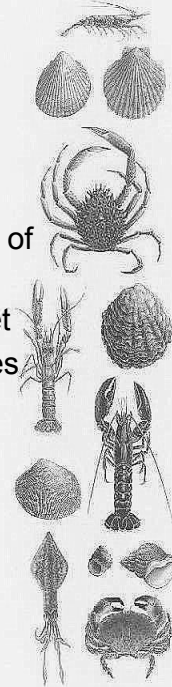
- “The Channel and North Sea stocks are fully exploited, but the spawning stock still appears to be robust, and there is no sign that the recruitment of small crab has declined” (Bannister, 2004)
- “Fishing mortality is moderate on males, but fairly high on females, but appears to have fallen slightly since the 1980’s” (Bannister, 2004)



Shellfish Industry Development Strategy

Stock-size sustainability

- The shellfish licensing scheme caps the numbers of vessels allowed to fish for crustaceans
- It does not limit the number of pots that can be set
- If the number of pots used by individuals increases steadily it will cause fishing mortality to increase and will reduce sustainability.
- The industry itself is calling for a cap on pot numbers to ensure sustainability and a viable fishery.

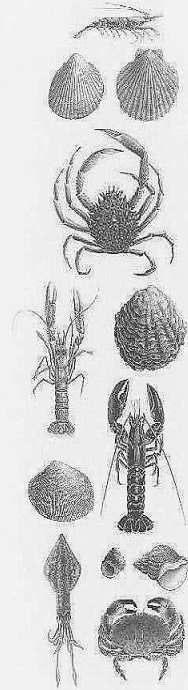


Shellfish Industry Development Strategy

What is 'sustainability'?

- Stock-size sustainability ✓
- Ecosystem sustainability
- Global sustainability

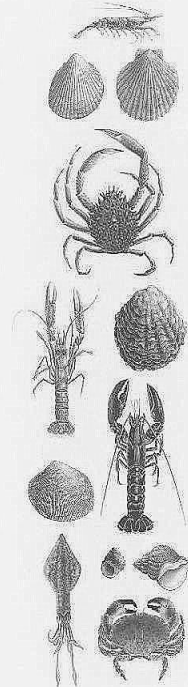
How does pot-caught brown crab rate?



Shellfish Industry Development Strategy

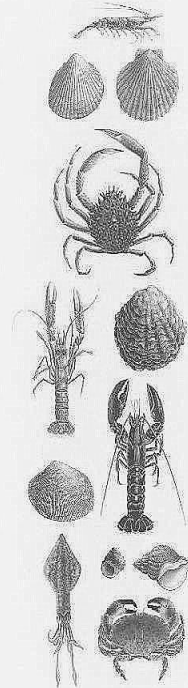
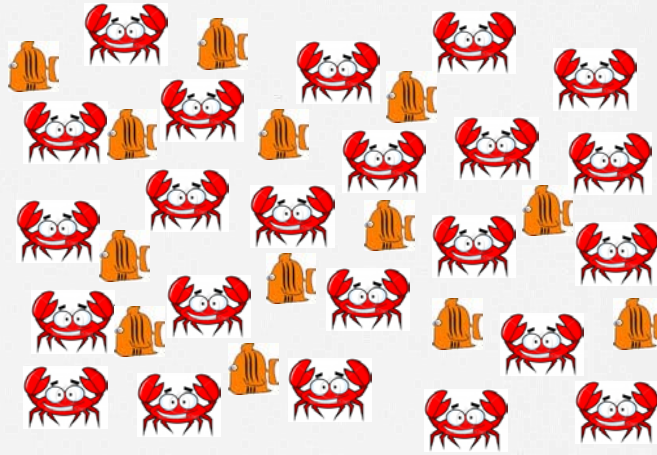
Ecosystem sustainability

- Looks at the bigger-picture; not just the stock in question
- The wider impacts of the fishery:
 - Bycatch
 - Habitat damage



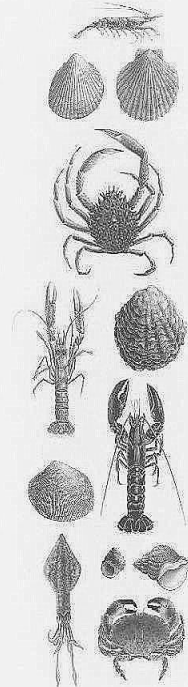
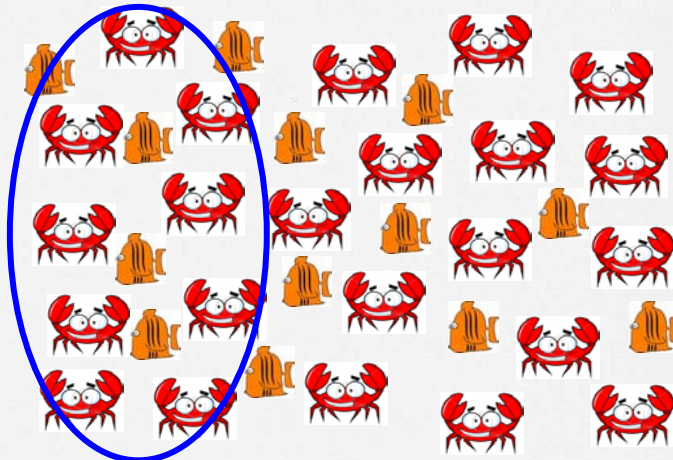
Shellfish Industry Development Strategy

Ecosystem sustainability



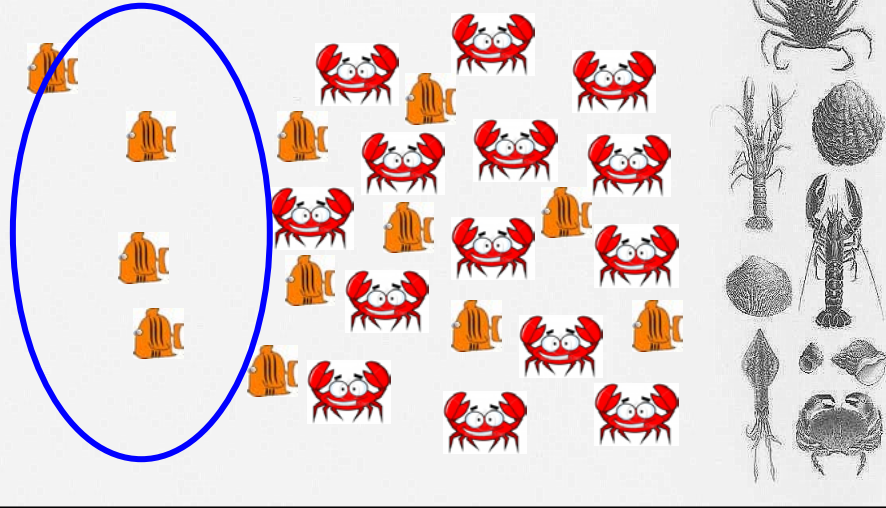
Shellfish Industry Development Strategy

Ecosystem sustainability



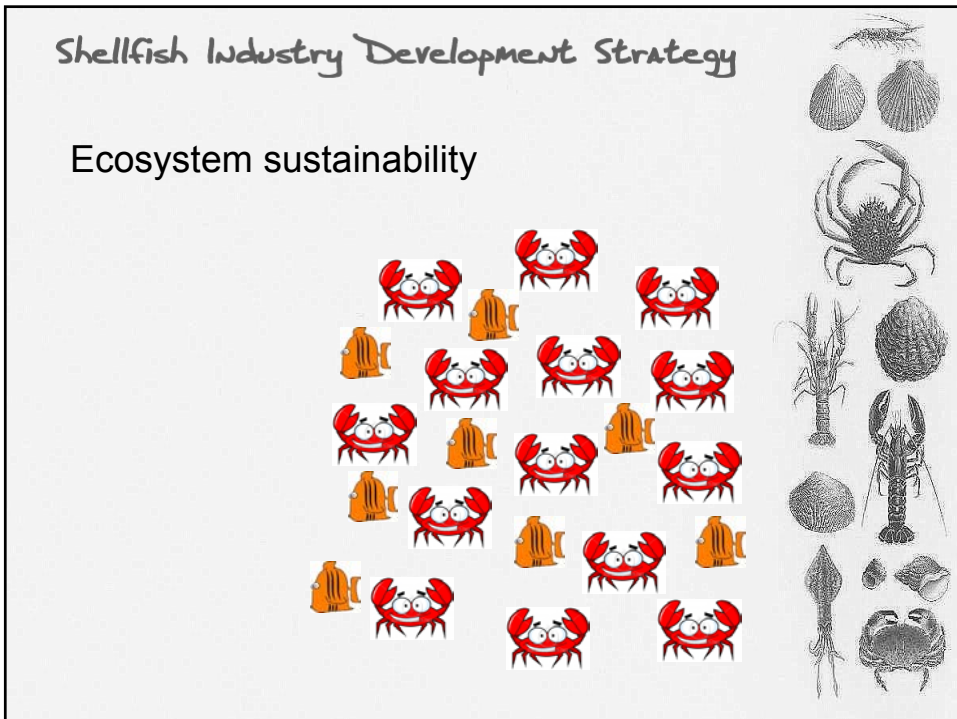
Shellfish Industry Development Strategy

Ecosystem sustainability



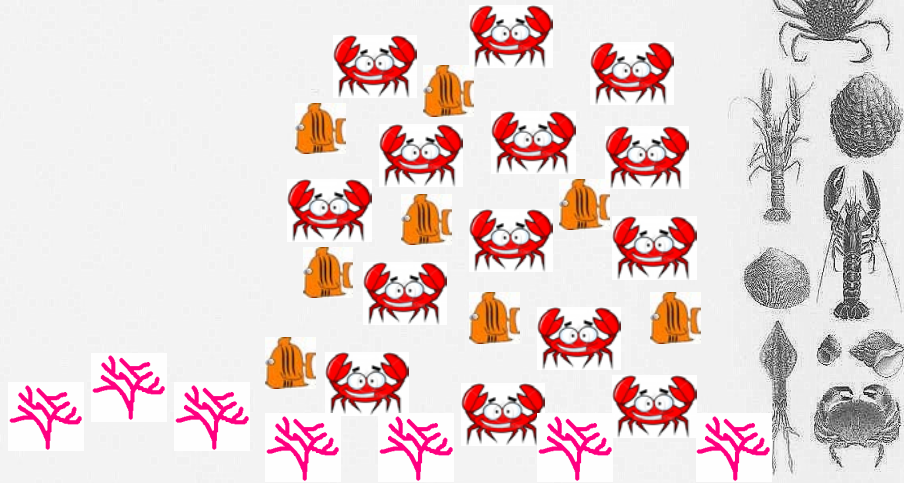
Shellfish Industry Development Strategy

Ecosystem sustainability



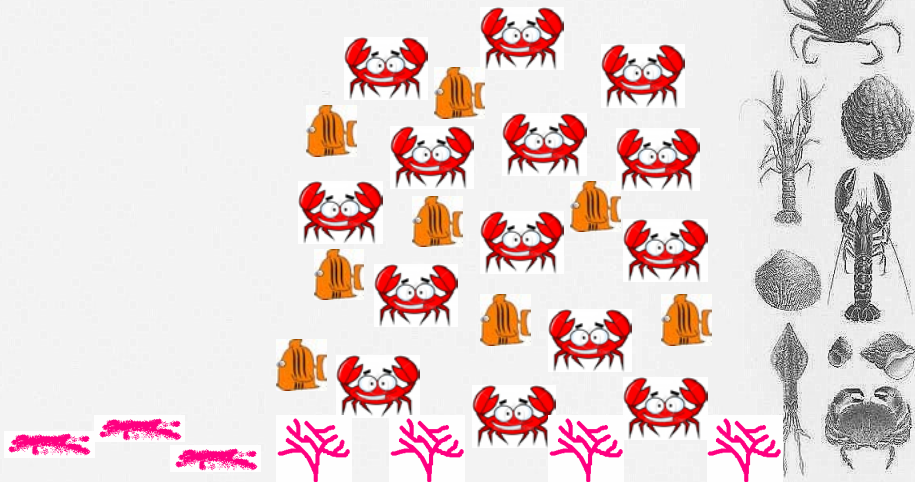
Shellfish Industry Development Strategy

Ecosystem sustainability



Shellfish Industry Development Strategy

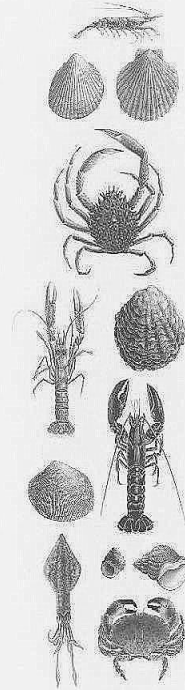
Ecosystem sustainability



Shellfish Industry Development Strategy

Ecosystem sustainability - bycatch

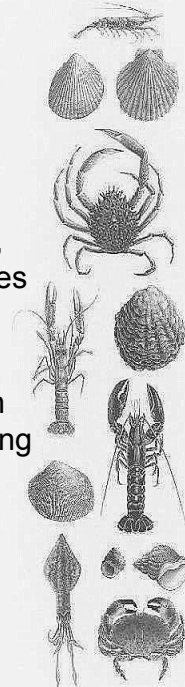
- Bullimore, B.A., Newman, P.B., Kaiser, M.J., Gilbert, S.E. & Lock, K.M., (2001). A study of catches in a fleet of 'ghost-fishing' pots. Fishery Bulletin, 99, 247-253.



Shellfish Industry Development Strategy

Ecosystem sustainability - bycatch

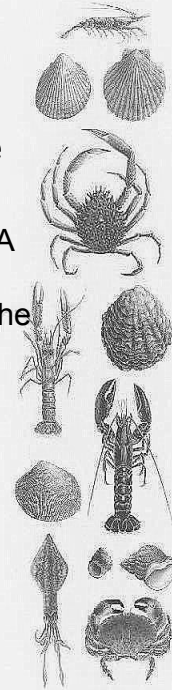
- “Spider and brown crabs dominated the catches, whereas lobster, velvet swimming crab, and fishes were caught less frequently.”
- “Divers found several spider crabs that had been tagged in one pot, but on the subsequent sampling occasion, they were recorded in a different pot. These animals had escaped one trap only to be captured in another.”



Shellfish Industry Development Strategy

Ecosystem sustainability – habitat damage

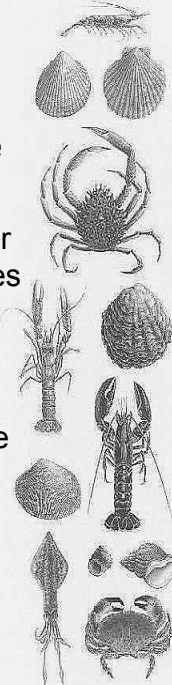
- Eno N.C., MacDonald D.S. & Amos S.C. (1996). A study on the effects of fish (crustacea/mollusc) traps on benthic habitats and species. Report to the European Commission.



Shellfish Industry Development Strategy

Ecosystem sustainability – habitat damage

- “One month’s active fishing using crab and lobster pots caused no difference in abundance of species between control and experimental study plots.”
- “Abundance of some species increased after potting in comparison with their abundance before potting.”
- “Potting did not have a detrimental effect on the abundance of species studied.”



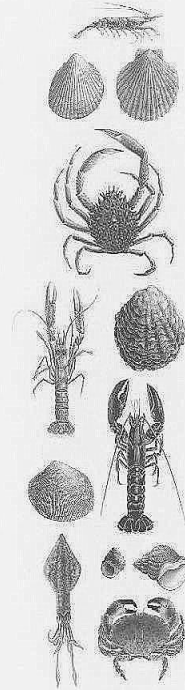
Shellfish Industry Development Strategy

Ecosystem sustainability

- MCS “FISHING METHODS LEAGUE TABLE”
- Overview of 24 fishing methods
- Scored the impact of crab pots as:



Low Impact / Well Managed

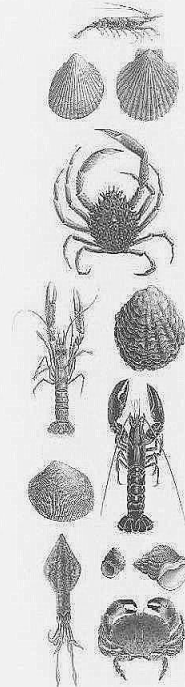


Shellfish Industry Development Strategy

What is ‘sustainability’?

- Stock-size sustainability ✓
- Ecosystem sustainability ✓
- Global sustainability

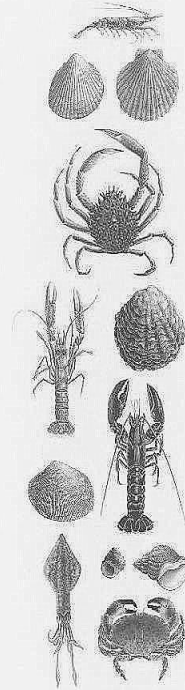
**How does pot-caught
brown crab rate?**



Shellfish Industry Development Strategy

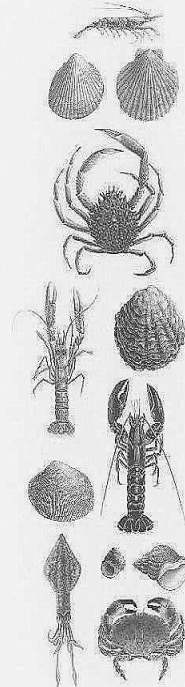
Global sustainability

- Concerned with the 'life-cycle' of the product
 - Transport
 - Packaging
 - Waste etc



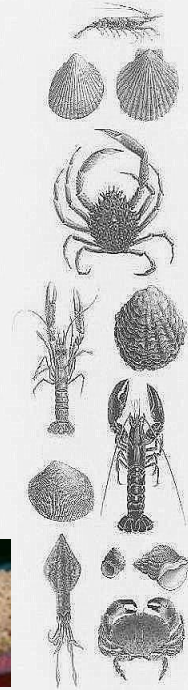
Shellfish Industry Development Strategy

Global sustainability



Shellfish Industry Development Strategy

Global sustainability

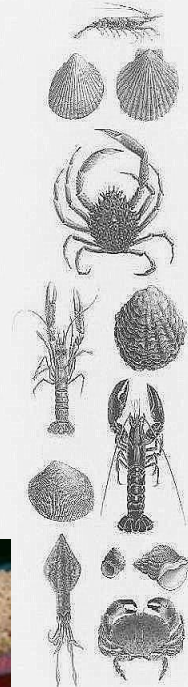


Shellfish Industry Development Strategy

Global sustainability

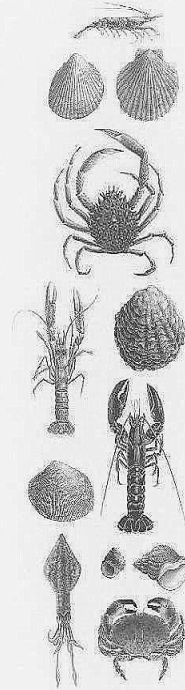


Waste



Shellfish Industry Development Strategy

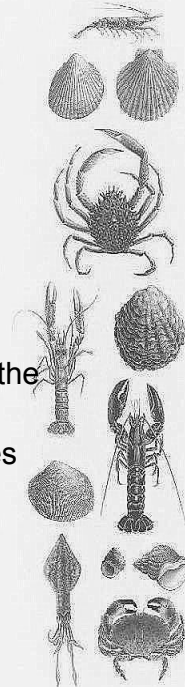
Global sustainability



Shellfish Industry Development Strategy

Global sustainability

- Food miles issue not well studied
- Most UK shellfish has little packaging
- Or it's own shell! – biodegradable waste
- Brown crabs processed in UK or shipped live to the markets in France & Spain
- Not shelled in Far East unlike some other species

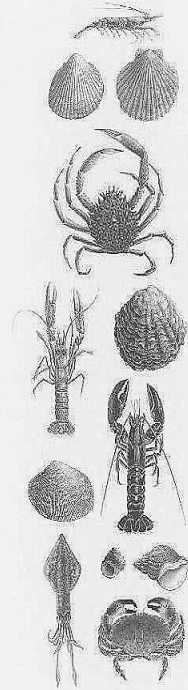


Shellfish Industry Development Strategy

What is 'sustainability'?

- Stock-size sustainability ✓
- Ecosystem sustainability ✓
- Global sustainability ✓

How does pot-caught brown crab rate?



Shellfish Industry Development Strategy

What do others think?

"Choose crabs that have been caught in pots, the most sustainable method of fishing for crabs."

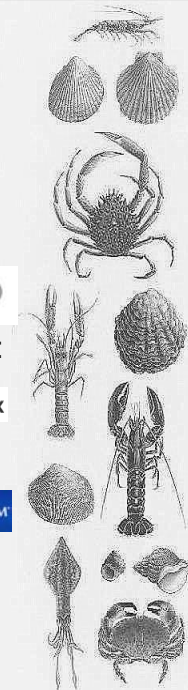


"Examples of seafood from well managed fisheries:
Pot caught Brown crab from Devon"

GREENPEACE UK

"crabs are caught in traps that take little bycatch"

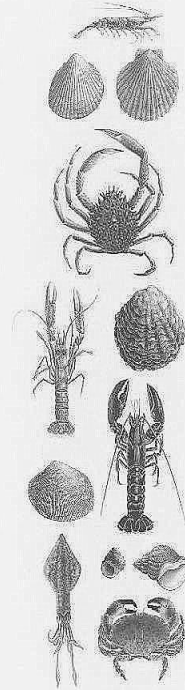
 MONTEREY BAY AQUARIUM



Shellfish Industry Development Strategy

Take-home Messages (I)

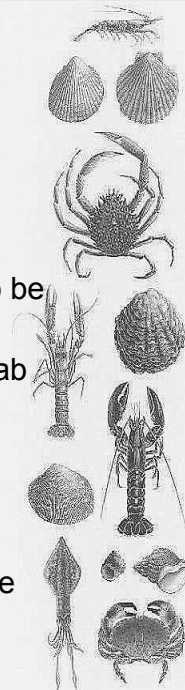
- Look beyond just stock-size and proportion harvested
- Consider wider ecosystem effects of the fishing method
- Think about the global impact of the finished product



Shellfish Industry Development Strategy

Take-home Messages (II)

- “The Channel and North Sea stocks are fully exploited, but the spawning stock still appears to be robust”
- “There is no sign that the recruitment of small crab has declined”
- Potting is a low impact method of fishing
- Potting has little bycatch
- Industry wants effort cap to sustain the fishery
- The product remains in UK or landed/shipped live to Continent



Shellfish Industry Development Strategy

Pot-caught brown crab is sustainable!

