



Department  
for Environment  
Food & Rural Affairs



# A scientific perspective on challenges and developments in the shellfish sector



# Content

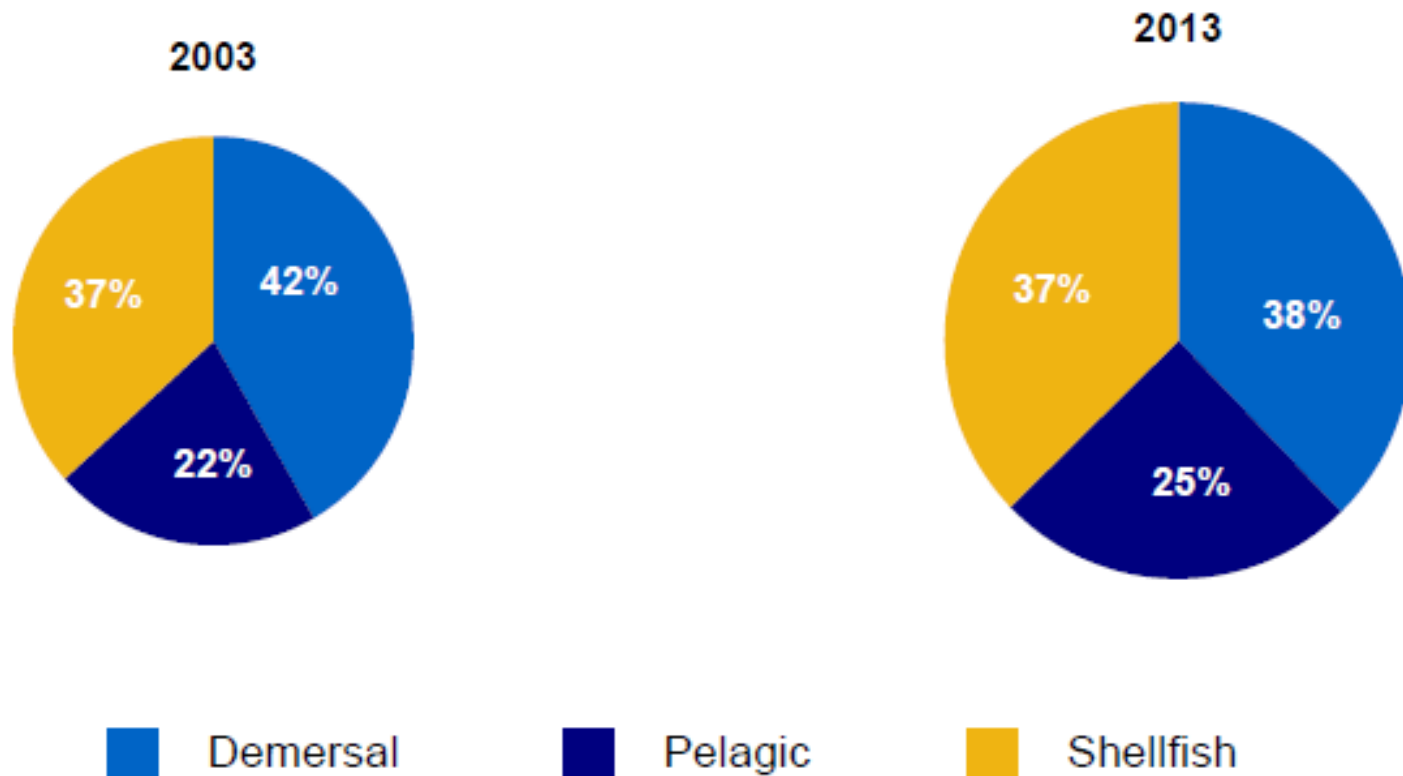
- Sector
- Vision
- Key challenges
- Science and Evidence
- Developments and Opportunities

# The sector: Wild shellfisheries

- Main commercial species include crabs, lobsters, scallops, but
- Increasing pressure on less traditional target species including cuttlefish, whelks, cockles.
- High market value
- Some stocks within the 6 nm limit (IFCA management) or exploited only by UK fisheries
- No catch quota from EU (except for *Nephrops*)

# The sector: Wild shellfisheries

## Value of landings by UK vessels into the UK and abroad

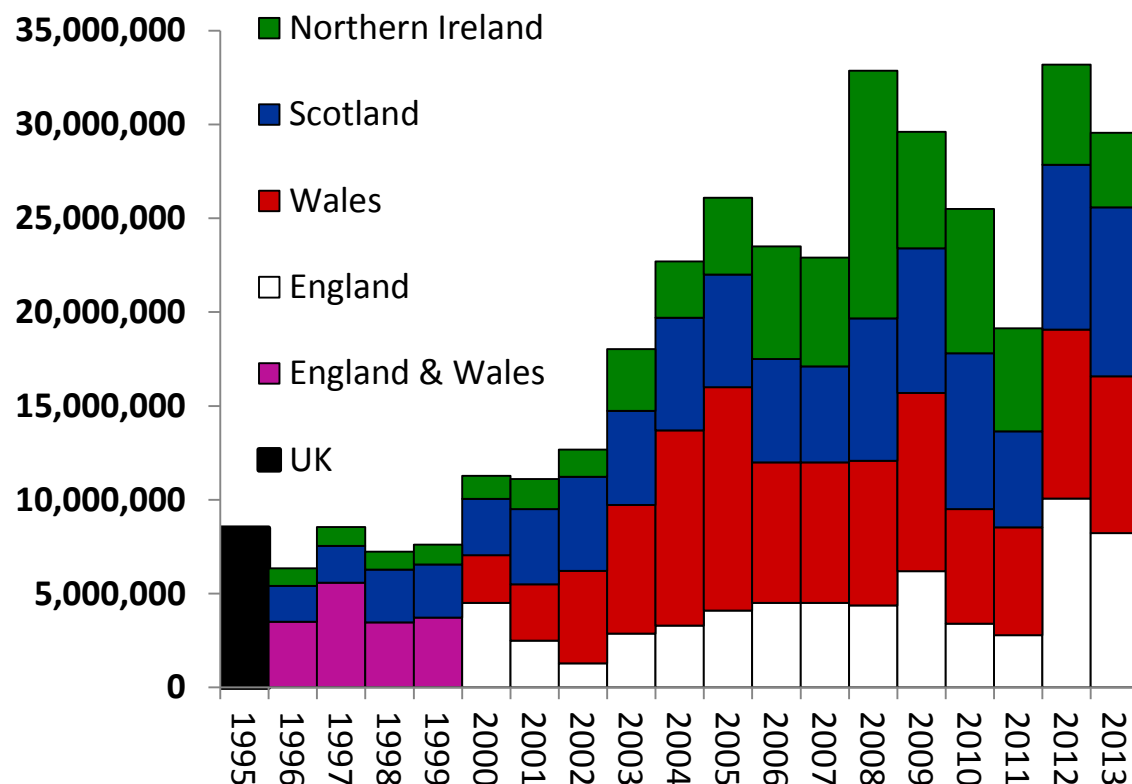


Source: UK Sea Fisheries Annual Statistics

# The sector: Shellfish aquaculture

- Main species are oysters, mussels
- Increased production over the years
- Relatively low environmental impacts

Value of shellfish aquaculture sector (£)



# Comparative efficiency of aquaculture

(Adapted from Phillips et al. 1991, FAO 2003, Hall et al. 2011)



	Food Conversion	Protein efficiency	Nitrogen emissions	Phosphate emissions	Water consumption	Land use
Beef	Green	Green	Green	Green	Green	Green
Chicken	Green	Green	Red	Red	Red	Green
Pigs	Green	Green	Green	Red	Red	Green



	Food Conversion	Protein efficiency	Nitrogen emissions	Phosphate emissions	Water consumption	Land use
Beef	Green	Green	Green	Green	Green	Green
Chicken	Green	Green	Green	Green	Green	Green
Pigs	Green	Green	Green	Green	Green	Green

# Our Vision

- A thriving shellfish sector supporting the UK economy and local communities.
- Healthy, highly productive stocks
- Low environmental footprint



# European context

- Commitment to achieve Maximum Sustainable Yield (MSY) for commercial shellfish stocks
- Emphasis on ecosystem approach
- EU Guidelines for boosting aquaculture
- Blue growth agenda





# Challenges

- Multiple dependencies and links among species and habitats makes it difficult to understand impacts.
- Limited knowledge of biological processes
- High risk of overexploitation given demand/price (need to understand exploitation better)
- Finite resources/funding



# Challenges

- New EU requirements/targets create a level playing field across EU but also increase work (ecosystem approach)
- Impact of climate change (incidents and distribution of toxin threats, impact of flooding on water quality, more risk from invasive species)
- Competition for space (use of marine environment, competing activities)



# Using science to meet challenges

Research on stock dynamics help understand species responses to pressure and safe level of catches

PIECRUST:

Covers both crabs and lobsters and develops methods for:

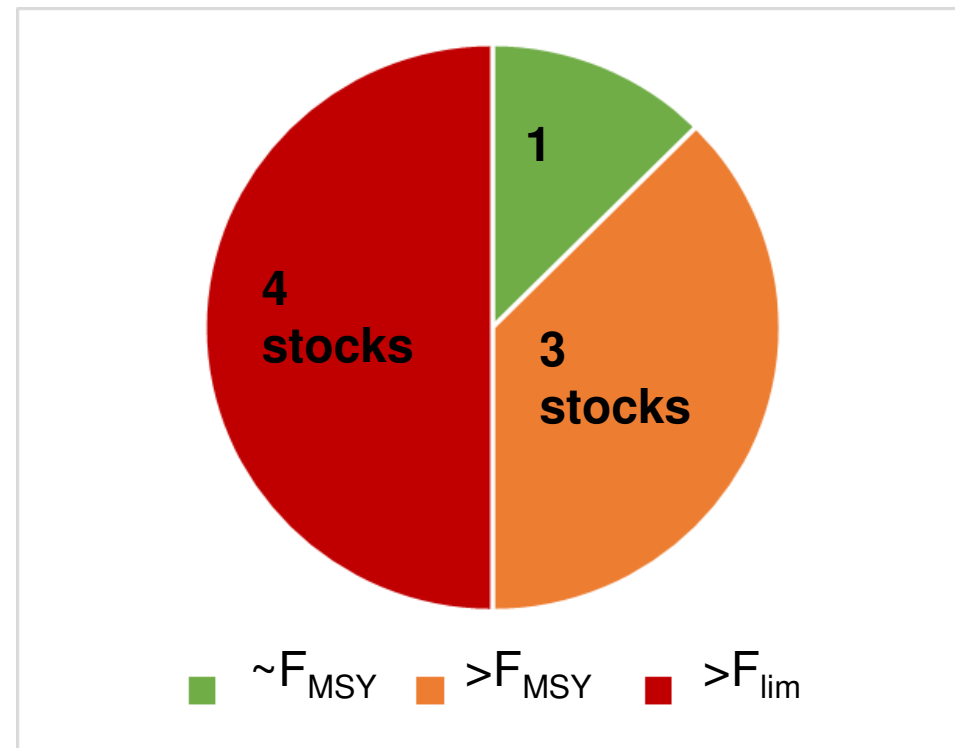
- Monitoring growth
- Assessing recruitment strength



# Stock assessment analysis

- Quantitative estimates available for most crabs and lobsters stocks around England.
- Assessment still not possible for 2 stocks.
- Results indicate that exploitation is above optimum levels for most stocks.
- Need to improve data

## Exploitation of crabs and lobsters



Latest results. Stock assessment undertaken by Cefas

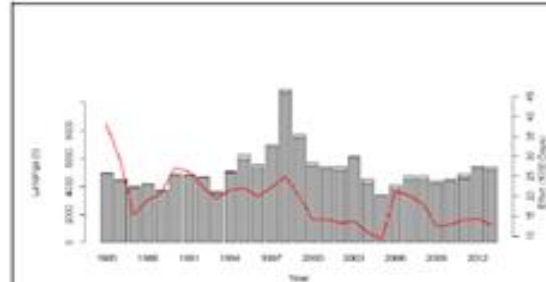
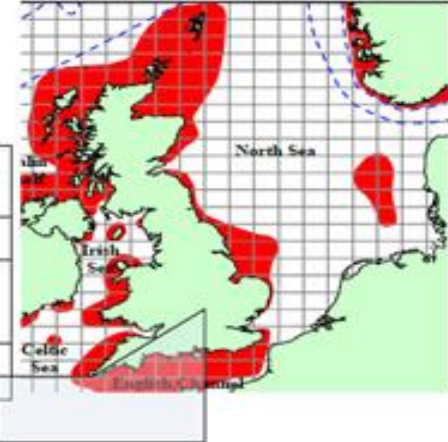
# Make findings and science easily accessible

- 2-page summaries for each stock available online
- Cefas and IFCA's contribute data for assessment
- Cefas explores options for closer collaboration with fishermen

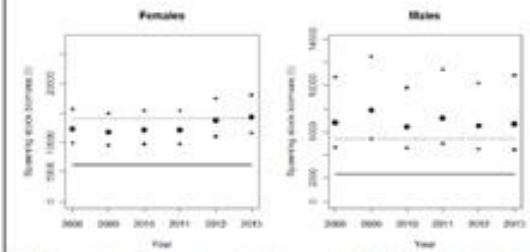
## Cefas Stock Status 2013: Edible crab (*Cancer pagurus*) in the Western English Channel

### Sustainability Status

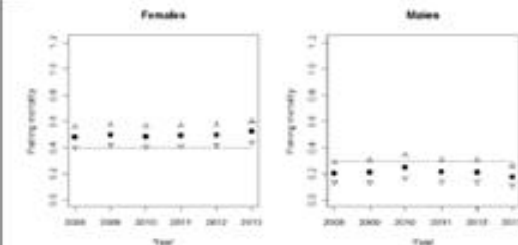
Minimum Landing Size	Multiple spawning opportunity before capture
Discarding	High discard survival
Exploitation rate	Around level generating Maximum Sustainable Yield (Females above, males below)
Stock size	At Maximum Sustainable Yield target



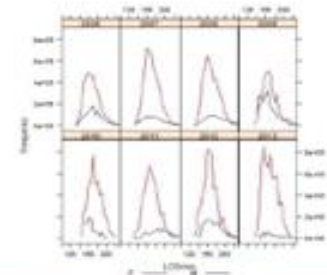
a) Landings (bars – dark grey = pots, light grey = other gear) and effort (red lines): Note: Changes in recording levels in 2006 and 2009



b) Time series of biomass estimates and MSY<sup>1</sup> target (dashed) and minimum recommended limit (solid).



c) Fishing mortality time series with FMSY<sup>2</sup> target (dashed) and maximum recommended limit (solid). Maximum limits lie outwith the scale.



d) Size distributions for the last 6 years; male: blue, female: red.

# Improving evidence collection

*Collection and use of data that is easier, faster, more effective and reliable.*

## MSAR:

- Using digital technology, on-line tools
- Aim to fill gaps about exploitation of shellfish
- Reduce processing time
  - fishermen submitting data electronically
  - automatic checks

## Shellfish Returns

[Calendar view](#) [Manage account](#) [Sign out](#)

**ALPHA** This is a new service – your [feedback](#) will help us to improve it.

Home > Catch view

Vessel:

Test Vess Two ▾

Previous month

May 2015 ▾

Next month

Activities calendar

[Retained catch summary](#)

[Comments](#)

<b>1<sup>st</sup></b>	<b>Friday</b>				
	<b>Location</b>	<b>Target species</b>	<b>Gear</b>	<b>Gear hauled</b>	
	31E6 in belt 3-6 Mi landing at SWANSEA	LOBSTERS	PARLOUR POTS	2	<a href="#">Edit</a>
	<a href="#">Add activity</a>				
<b>2<sup>nd</sup></b>	<b>Saturday</b>				
	<a href="#">Add activity</a>				
<b>3<sup>rd</sup></b>	<b>Sunday</b>				
	<a href="#">Add activity</a>				
<b>4<sup>th</sup></b>	<b>Monday</b>				
	<b>Location</b>	<b>Target species</b>	<b>Gear</b>	<b>Gear hauled</b>	
	31E6 in belt 3-6 Mi landing at SWANSEA	BROWN CRAB	PARLOUR POTS		<a href="#">Edit</a>

# Control invasive species

- Defra-funded research focusing on control of non-native crayfish
- Consider alternative trap designs to maximise chance of capture
- Closely supported by volunteers from Anglian Trust to deploy and check traps
- Development of analytical tools to assess effort needed and best treatment to eradicate colonies



# Effects of climate change on toxins

- FSA-funded research considered the effects of climate change on toxins in the marine environment
- Identified new toxins that could affect UK waters
- Reviewed the risks of new toxins to shellfish products
- Focused work on developing reliable methods of:
  - Detecting the new toxins
  - Measuring their levels in shellfish



Rural Affairs



# Safeguard shellfish health

Research on new diseases and their impact on shellfish can inform business decisions and support action to mitigate threats

- New molecular techniques has improved our ability to detect pathogens and understand their effects on shellfish species.
- New research has highlighted the potential impact of diseases on mortality of juvenile edible crab stocks

# Using science to meet challenges

**It is a joint effort!**



# Our evidence strategy

***Promote co-ownership,  
co-design and co-funding  
of evidence activities***

***Drive innovation and  
quality in the ways we  
access and use evidence***

***Sustain critical evidence  
capacity and capabilities***



[www.gov.uk/defra](http://www.gov.uk/defra)

**Making the most of our evidence:  
A strategy for Defra and its network**

June 2014



# Joint action: Shellfish symposium

Hosted by Defra, brought together scientists, Government, NGOs, industry, and funding bodies to:

- Increase collective understanding of the current state of evidence and action still needed
- Catalyse joint research and strengthen communication

*Led to:*

An online communication platform to meet the need for a Shellfish Research Network\*

A LinkedIn group for UK shellfish research

An action plan from the Symposium is being developed



# Opportunities for joint evidence work

- Funding opportunities include European Regional Development Funds; EMFF; Horizon 2020
- Comprehensive on-line guide to funding opportunities and research partners for aquaculture developed by Seafish
- Discussions with all interested parties about stock-specific management plans for crabs and lobsters.
- Next round of MMO consultation on Marine Plans
- A review of monitoring schemes for scallops and industry's role in evidence gathering is underway.
- The UK's Multiannual Aquaculture Plan will highlight key areas EMFF will look to fund.



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# Questions



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