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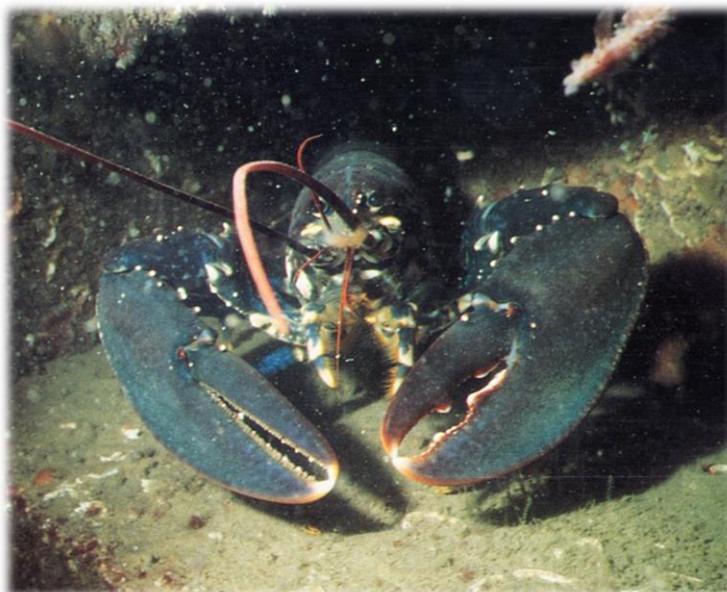
# Lobster (*Homarus gammarus*)

## Cefas Stock Status Report 2014.

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The Shellfish Team  
2014

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## Cefas Document Control

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# Cefas Stock Status report 2014: Lobster (*Homarus gammarus*)

## Background

Cefas has published reports describing the status of the lobster (*Homarus gammarus*) stocks around the UK since 2012. It is planned to re-run the assessment every 2 years. This report details the main findings of the assessments and provides background information describing how the assessments are undertaken, the data that are required, and description of the uncertainties associated with these assessments.

## Biology

European lobster can be found from Scandinavia to North Africa, where they occupy solitary shelters in rocky substrates. They are opportunistic scavengers, as well as preying on small crustaceans, molluscs and polychaetes (worms). Moulting occurs in summer approximately once a year for adults, becoming less frequent in older animals, and mating occurs soon after the female has moulted. After the eggs hatch the larvae are in the water for 3-4 weeks before the first juvenile stages settle on the seabed. Larval distribution depends on local hydrographical conditions and the behaviour of individuals. With such a lengthy time in the plankton, the probability of individual larvae surviving is low and consequently recruitment levels are highly variable. Both sexes are considered fairly sedentary, although some inshore/offshore and longshore migration is known to take place at some locations.

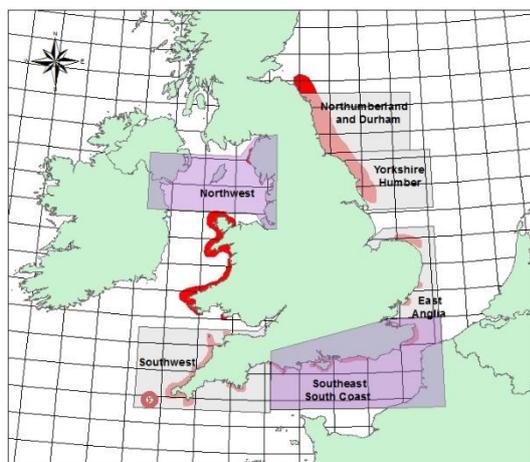


Figure 1. – The CFU's used for the assessment regions. The CFU in purple did not have sufficient data for an assessment this year.

## Fishery Unit Definitions

There are six Lobster Fishery Units (LFU) that have been defined for England. These units have been based upon the distribution of the fisheries, hydrographic conditions and what is known of larval distributions and development. Each LFU encompasses waters covered by International, National and local (IFCA) legislation which may be different within each region. The LFU's are presented in Figure 1.

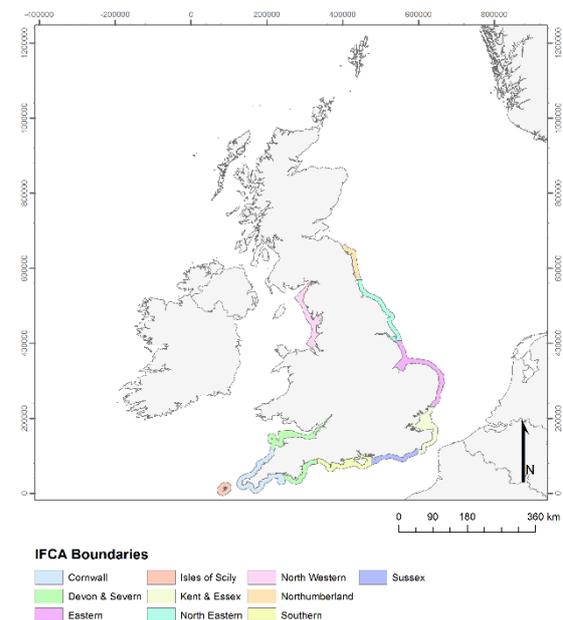


Figure 2. – The IFCA boundaries.

Fishery management jurisdiction is organised on two different scales around England. Beyond 6 nautical miles, Defra and the MMO are responsible for managing crab fisheries whereas from the coast out to 6 nautical miles, responsibility lies with the Inshore Fisheries and Conservation Authorities (IFCAs). There are 10 IFCA within England, and their regions extend from the coast out to 6nm (see Figure 2). It is obvious that the LFU and IFCA boundaries do not match, which can make interpreting results for each management unit challenging, however given that one functional area is based on species biology and the other is based on governmental logistics, differences are to be expected.

### Data sources used

Landings come from the official MMO data records and there have been changes in the way the MMO (and its predecessors) have gathered landings data. For larger vessels landings and effort are taken from the mandatory EU logbooks. Prior to 2006, records of landings from smaller vessels (<10m) were gathered by local officers. Since a change in legislation in 2006, sales note returns from merchants are used to support the landings declarations. Between 2006 and 2008, MMO landings data were also supplemented by self-reported records of landings from the Monthly Shellfish Activity Return (MSAR) forms where no sales note had been generated.

Fishing effort is derived by the MMO from MSARs for <=10m vessels or EU logbooks for >10m vessels. There is no requirement for potting fisheries to record the number of pots being fished, so in this report effort is measured as days fished.

The changes to reporting systems over time have predominantly improved the data quality but mean that landings and effort series cannot be viewed as coherent records through time.

Scientific officers visit ports to measure individual animals from catches and determine the ratio of landings by sex. Samples are also received from IFCA's in some regions, and these length samples are combined with Cefas' and scaled up to represent the total landings of lobster.

### Overall Landings trends

Figure 3 presents the total official landings data that is used within the assessments. The data pertains to all English and Welsh vessels landing anywhere, and all landings into England and Wales from any nationality of vessel. It can be seen that the overall landings values have varied throughout the time period, there appears to have been a slight increase in landings since 2011.

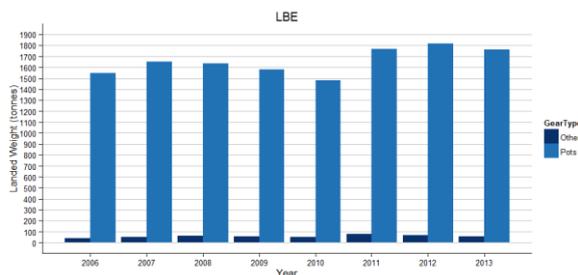


Figure 3 – The official landings for UK E&W.

Figure 4 presents the landings per rectangle for 2013, and Figure 5 presents the average landings per rectangle from 2006 to 2012. These plots show that although the overall landings appear to be increasing, the area from which the animals are being caught is decreasing.

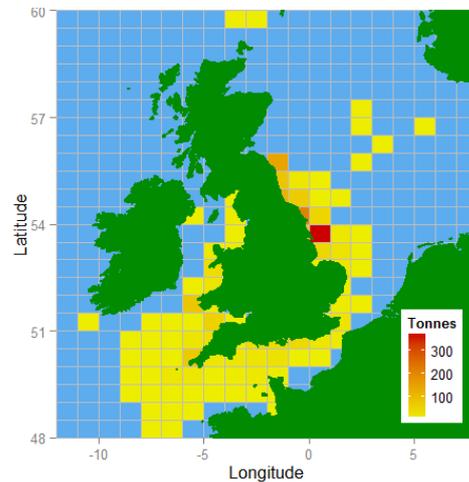


Figure 4 – The landings per ICES rectangle for 2013.

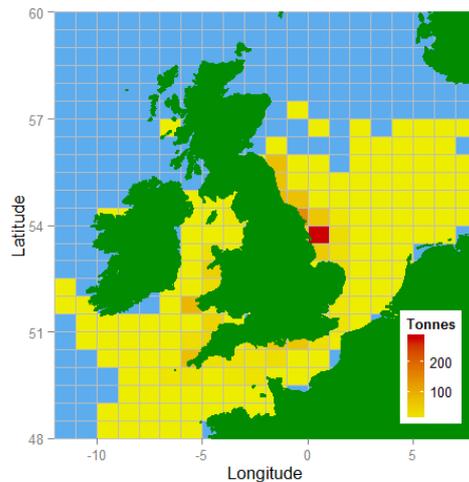


Figure 5 – The average landings per ICES rectangle from 2006 to 2012.

### Assessment Methodology

Within European waters, most major stocks are assessed using methods which monitor the change in numbers over time for animals born in a particular year. This is possible because most fin-fish have bony structures which retain annual growth rings. Crustaceans shed their shell each time they moult and do not retain structures that can be easily used to determine their age, so an alternative assessment method has to be employed.

The methodology used in this assessment follows the change in shape of the length-frequency (numbers at length) from one year to the next. The rates at which individual lobsters grow and die dictates how many animals at a given size there are in the population. Armed with knowledge of the growth rate of animals and the rate of natural death (M) assumed to be 0.15, the shape of the length-frequency curve is used to infer the rate at which the fishery is removing individuals.

For further details of the Length Cohort Analysis approach see the full stock assessment report which can be obtained from Cefas.

### *Reference point definition*

A stock assessment result can indicate what the exploitation rate might be and how big the stock might be, but this is of limited use to fishery managers as they try to decide whether these rates are appropriate. The production of reference points aims to give managers benchmarks to see whether the management structure is being effective and whether fishing rates are above or below these points.

Reference points can be determined to achieve a number of different management objectives. For instance managers could simply want to ensure that the fishery was unlikely to collapse the stock, or alternatively managers could want the fishery to derive maximum long-term profit from the stock. Within the European Community framework, the current management objective to achieve fishing rates likely to deliver Maximum Sustainable Yield (MSY) from fisheries. This means the maximum landings that can be regularly taken without causing stock collapse. For crustacean fisheries scientists cannot directly calculate this rate and so rely upon alternative ways to estimate it.

This assessment uses 35% of virgin Spawner per Recruit (SpR) as the MSY level proxy, and this is commonly used around the world to estimate the fishing rate likely to deliver MSY. A second point termed a limit reference point has also been calculated and having fisheries operating beyond this level is considered to carry higher risk to the production of further generations. This value is defined as 15% of virgin SpR.

### *Uncertainty*

Fishery stock assessments are never perfect because any assessment model will produce estimates rather than absolute values and the accuracy of these estimates is affected by the quality of the input data. Scientific data collection (in this case landed numbers at length) are taken from a relatively small number of landings and then scaled up to represent the whole landings, a process which doesn't claim to be exactly correct but should be broadly representative. Not all landings will be recorded as there are exemptions from reporting requirements for small scale fisheries and recreational catches.

An assessment model is an attempt to simplify the real world into a few key structures and functions, so the assumptions made in the process will cause the modelled system to depart from reality. What fishery stock assessment does attempt to do is to capture the main processes and data streams so that the final estimate of fishing rate and/or stock size is broadly correct.

For this assessment the key uncertainties come from:

- the scientific understanding of growth and natural death rates
- the representativeness of the landings used to collect length samples
- the assumptions within the assessment model of
  - a) the population being at equilibrium (constant recruitment)
  - b) the spatial coverage of the population is constant and all size ranges are equally available to the fishery
  - c) fishery statistics are complete and accurate.

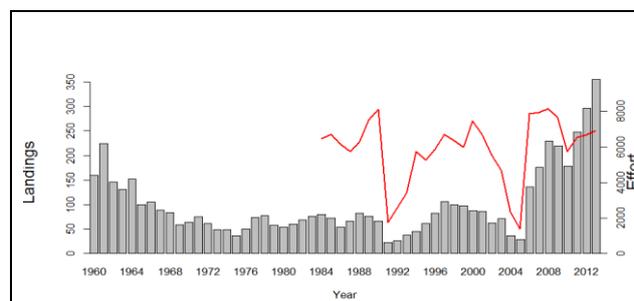
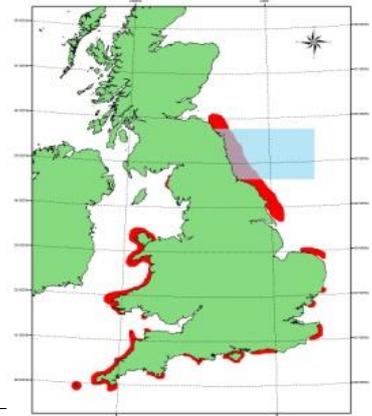
Cefas has a research program which continually searches to improve our understanding of processes governing population dynamics and there are currently projects focussing on growth and mortality rates. We are also working with the MMO to ensure that landings statistics are as complete and accurate as possible, and working with the IFCAs to ensure maximum efficiency and best practice in data collection.

Given the uncertainty in the input data and assessment model it is acknowledged that the precise value of any estimate of fishing mortality of stock size is uncertain but has sufficient reliability to indicate rates on a high-medium-low scale.

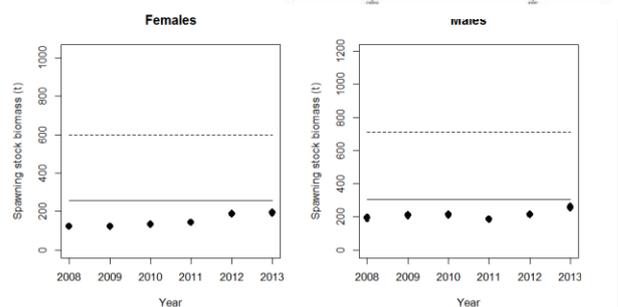
# Cefas Stock Status 2013: European lobster (Homarus gammarus) in Northumberland & Durham.

## Sustainability Status

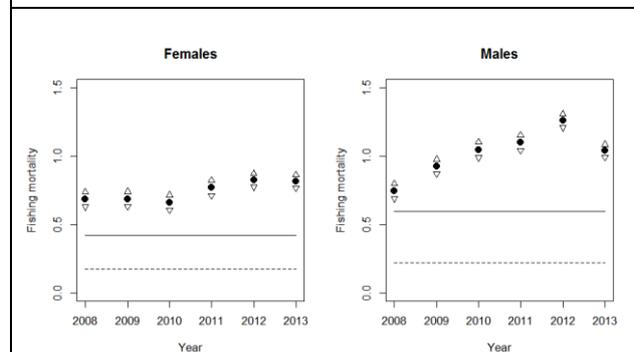
<b>Minimum Landing Size</b>	<i>At the MLS applied in this region around 100% males and 80% of females should be mature</i>
<b>Discarding</b>	<i>High discard survival assumed to be &gt; 90%</i>
<b>Stock size</b>	<i>Below minimum reference point limit but stable</i>
<b>Exploitation rate</b>	<i>Very high, beyond maximum reference point limit</i>



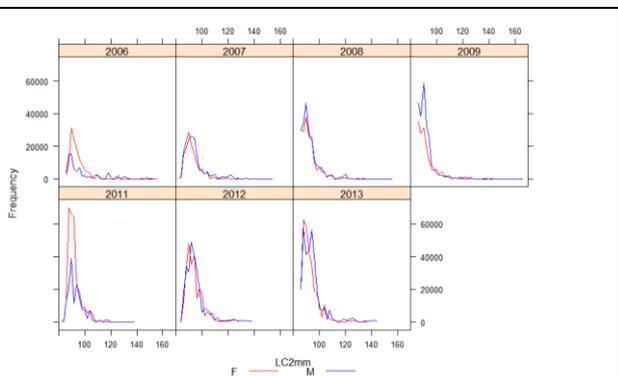
a) Landings (tonnes, displayed as bars) and effort (days, displayed as red line) time series. Note: Changes in recording levels in 2006 and 2009



b) Time series of biomass estimates and MSY target (dashed) and minimum reference point limit (solid).



c) Fishing mortality time series with FMSY target (dashed) and maximum reference point limit (solid).



d) Size distributions for the last 8 years: Blue is males, red is females. **Note no length data for 2010.**

**The status of the stock of lobster in the Northumberland & Durham area is low, male and female biomasses are around the minimum reference point limit. The exploitation level is very high, although it has decreased since 2012. Exploitation is significantly above the maximum reference point limit and is particularly high around the Minimum Landing Size. The status of the stock has improved slightly since the last assessment in 2012.**

## Sampling levels

Table 2. Sample numbers collected for Northumberland and Durham during the last three years.

Year	Samples used	No. animals sampled
2011	11	593
2012	27	961
2013	45	1941

## Fishery overview and developments

	2011	2012	2013
Fleet size <= 10m / >10 m	109/13	113/15	96/16
Effort (days fished) <= 10m / >10m	10,873/1394	10,090/1421	7707/1807

Reported landings and fishing effort increased substantially following the introduction of Buyers and Sellers legislation and the Restrictive Shellfish License Scheme in 2006. Since this period fishing activity data are thought to be generally more reliable but the integrity of the time series, especially fishing effort, is uncertain.

Fishing mortality (F) has decreased in the last year for both males and females. F is currently above target and limit levels for both sexes. Landings and effort have been increasing since 2010, and 2013 landings are the highest on record. F for males is typically higher than that for females. Spawning stock biomass (SSB) is close to the limit level and has increased in recent years.

There is a seasonal pattern to fishing activity with an inshore focus on lobster through the summer-autumn with a more offshore (4-30 miles) focus on crab during winter-spring. Boats will fish 5-6 days per week in summer, dropping to 2-3 in winter.

Within the Northumberland IFCA there are around 115 permit holders, of which ~80% are active during the summer and ~65% during the winter. The number of available licences has not changed recently and the ban on vessels >12m within the district has excluded larger nomadic operations. There is a pot limit within the District waters of 800 per vessel. Those fishing outside beyond the 6 mile limit deploy a further 200-1000 additional pots. There is little gear conflict reported between mobile and potting outfits within the Northumberland IFCA district. Within this district there is a spatial gradient in reported size distributions with smaller individuals dominating in the south (North Shields – Newbiggin-by-the-Sea) compared to the northerly Amble-Berwick section.

Within the NEIFCA district improved landings have been noted since the mandatory inclusion of escape gaps, accompanied by anecdotal reports of increased pre-recruit density on the grounds from 2013 onwards. Active vessel numbers have decreased slightly, although pots hauled and pot numbers have remained stable. Animal sizes are still highly constrained, although a more prominent new shelling period was noted on the main fishing grounds.

## Fishery Management measures.

- EC legislation sets a minimum landing size of 87mm for lobster in the UK and prohibits the landing of parts of lobsters.
- National legislation restricts the number of shellfish licences available in the UK and also prohibits the landing of lobsters with a v-notch in their tail fan.
- Local IFCA legislation varies and is detailed in the table below.

Table 1. Regional byelaws on Northumberland & Durham lobster fisheries.

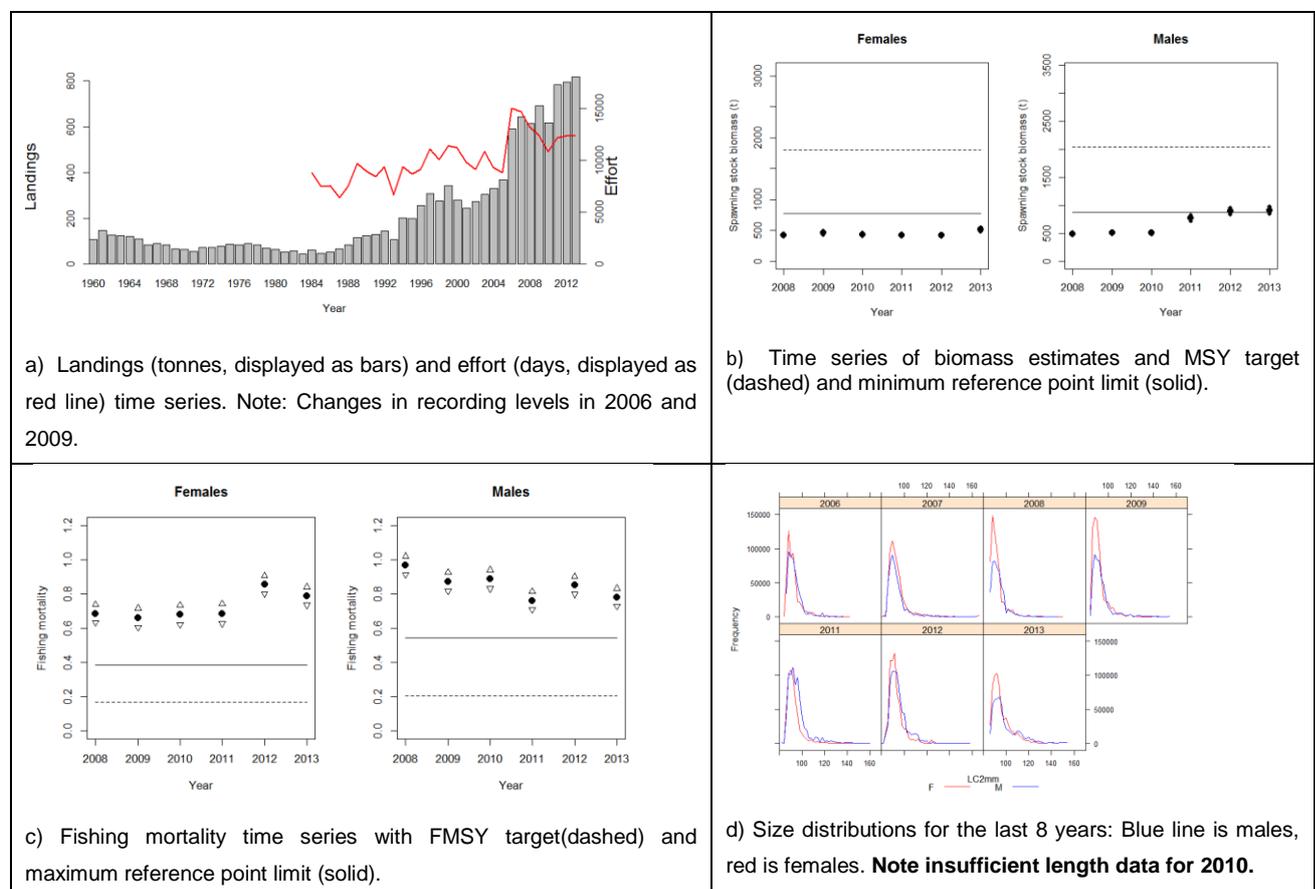
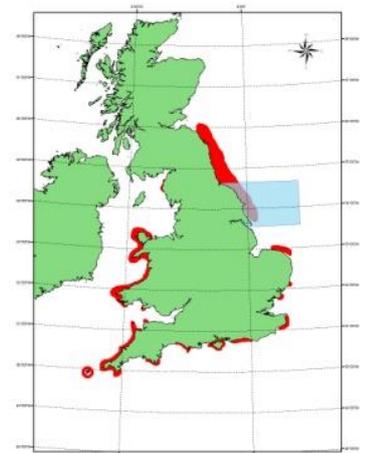
Title of Byelaw	Northumberland	North Eastern
Shellfish Permits	Yes	Yes*
Minimum Landing Size	No	No
Maximum Pot Limit	Yes - 800	No
Escape Gaps	No	Yes*
Maximum Vessel Length	Yes - 12m	Yes - 16m
Towed Gear Restrictions	No	No
Protection of Egg-Bearing Lobsters	No	No
Prohibits the Removal of Parts of Lobsters	No	Yes

\*Only applicable within the previous North Eastern Sea Fisheries Committee District

# Cefas Stock Status 2013: European lobster (*Homarus gammarus*) in Yorkshire Humber

## Sustainability Status

<b>Minimum Landing Size</b>	<i>At the MLS applied in this region around 99% of males and 86% of females should be mature.</i>
<b>Discarding</b>	<i>High discard survival assumed to be &gt; 90%.</i>
<b>Stock size</b>	<i>Below minimum reference point limit for females but improving</i>
<b>Exploitation rate</b>	<i>Very high, beyond maximum reference point limit</i>



The status of the stock of lobster in Yorkshire is low, female biomass is below the minimum reference point limit but the male biomass has been improving since 2010. The exploitation level is very high, above the maximum reference point limit but has decreased in recent years. The fishing pressure is particularly high around the Minimum Landing Size. The status of the stock has not changed since the last assessment in 2012.

### Sampling levels

Table 2. Sample numbers collected Yorkshire Humber during the last three years.

Year	Samples used	No. animals sampled
2011	81	5172
2012	94	6266
2013	145	7639

### Fishery overview and developments

	2011	2012	2013
Fleet size <=10m / >10 m	134/31	136/29	138/33
Effort (days fished) <= 10m / >10 m	12,970/3425	10,659/3113	12,461/3165

Reported landings and fishing effort increased substantially following the introduction of Buyers and Sellers legislation and the Restrictive Shellfish License Scheme in 2006. Since this period fishing activity data are thought to be generally more reliable but the integrity of the time series, especially fishing effort, is uncertain.

Fishing mortality (F) has decreased since 2010 for both males and females. F is currently above target and limit levels for both sexes but spawning stock biomass (SSB) is just above the limit for males. Landings have increased since 2011.

Since 2010 the fishery has expanded to offshore grounds. An increase in offshore vivier vessels has been seen and a lot of vessels have increased their pot numbers. This expansion of the fishery and change in fishing habits may explain the apparent decrease in F and increase in biomass, and the wider spread in length distributions for 2013.

NEIFCA data sources indicate that landings have continued to increase, following a trend established in the fishery since the early 1990's. The number of pots hauled has remained stable across the fishery, although accompanied by a reported increase in pot number. Displacement of gear has occurred within the Holderness fishery due to 2 offshore wind farm developments, pipeline works and associated surveys. Additionally oil & gas exploration also caused temporary displacement of some offshore operators. Vessel upgrades have also allowed for some operators to expand their fishing grounds into some lightly exploited areas. Sampling information indicates that animal sizes have remained similar to previous years with a good size distribution landed on the quayside and a regular number of large animals produced by the offshore fishery.

### Fishery Management Measures

North Eastern IFCA byelaws apply between the river Tyne and the river Tees (part of their area) and extend to 6nm out from coastal baselines.

- EC legislation sets a minimum landing size of 87mm for lobster in the UK and prohibits the landing of parts of lobsters.
- National legislation restricts the number of shellfish licences available in the UK and also prohibits the landing of lobsters with a v-notch in their tail fan.
- Local IFCA legislation varies and is detailed in the table below.

Table 1. Regional byelaws on Yorkshire Humber lobster fisheries.

Title of Byelaw	North Eastern
Shellfish Permits	Yes*
Minimum Landing Size	No
Maximum Pot Limit	No
Escape Gaps	Yes*
Maximum Vessel Length	Yes - 16m
Towed Gear Restrictions	No
Protection of Egg-Bearing Lobsters	No
Prohibits the Removal of Parts of Lobsters	Yes

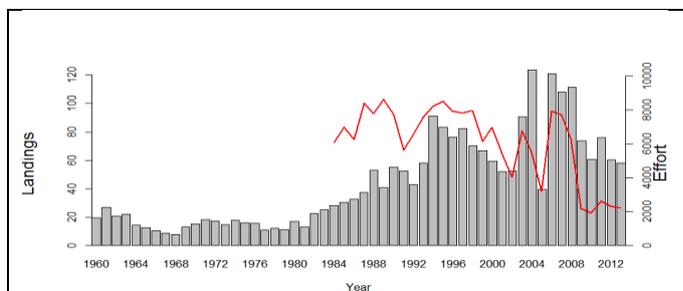
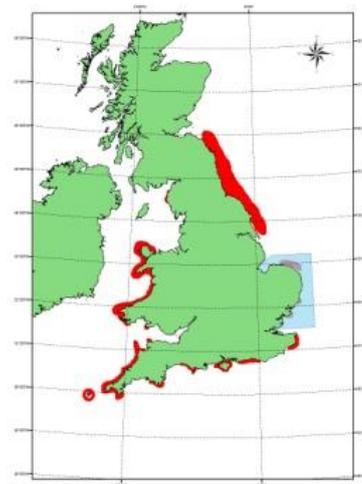
\*Only applicable within the previous North Eastern Sea Fisheries Committee District

# Cefas Stock Status 2013: European lobster

## (Homarus gammarus) in East Anglia

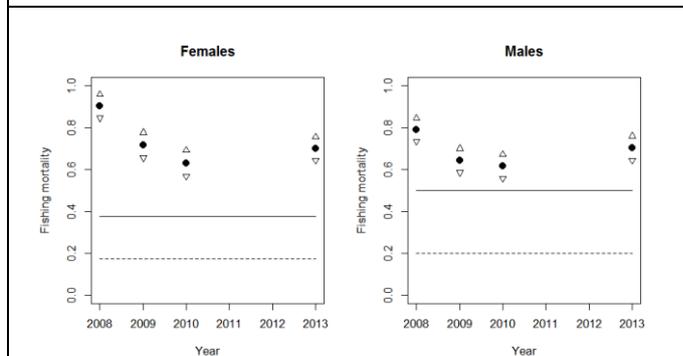
### Sustainability Status

<b>Minimum Landing Size</b>	<i>At the MLS's applied in this region between 99-100% of the males and 86-92% of the females should be mature</i>
<b>Discarding</b>	<i>High discard survival assumed to be &gt; 90%</i>
<b>Stock size</b>	<i>Unknown due to changes in recording.</i>
<b>Exploitation rate</b>	<i>Very high, beyond maximum reference point limit</i>

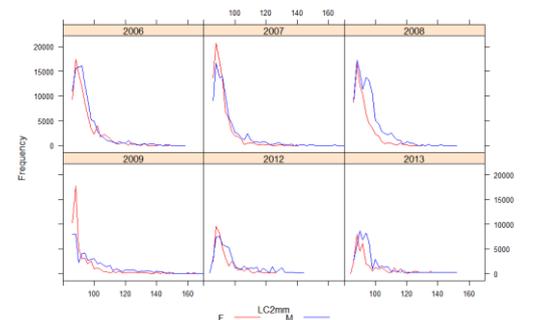


a) Landings (tonnes, displayed as bars) and effort (days, displayed as red line) time series. **Note changes in recording levels in 2006 and 2009.**

b) Absolute biomass calculations unreliable due to changes in landings data recording.



c) Fishing mortality time series with FMSY target (dashed) and maximum reference point limit (solid).



d) Size distributions for the last 8 years: Blue line is male, red in females. **Note insufficient length data for 2010 & 2011.**

**The status of the stock of lobster in East Anglia is unknown. Changes in the way landings have been recorded in 2006 and 2009 mean the data are inconsistent and unsuitable for scaling the assessment. Data are insufficient for assessment for 2011-2012. Estimation of exploitation levels for the most recent point indicate that exploitation levels remain high.**

### Sampling levels

Table 2. Sample numbers collected for East Anglia during the last three years.

Year	Samples used	No. animals sampled
2011	11	115
2012	10	383
2013	36	1112

### Fishery overview and developments

	2011	2012	2013
Fleet size <=10m / >10 m	73/6	69/4	72/6
Effort (days fished) <=10m / >10 m	3598/177	3599/131	3407/256

Reported landings and fishing effort increased substantially following the introduction of Buyers and Sellers legislation and the Restrictive Shellfish License Scheme in 2006. Since this period fishing activity data are thought to be generally more reliable but the integrity of the time series, especially fishing effort, is uncertain.

Length samples were not taken in 2010 and were more sparse in 2011 than in previous years, consequently no assessment was presented for 2011 and 2012, as the assessment is based on the latest 3 years of length data. Fishing mortality (F) has increased since 2010 for males and decreased for females. F is above target and limit levels for both sexes. Landings and effort have decreased then stabilised since 2011.

### Fishery Management measures.

Eastern IFCA byelaws apply between the Wash and the River Stour (part of their area) and extend to 6nm out from coastal baselines. Kent & Essex IFCA byelaws apply between the River Stour and the eastern end of Rye Bay and extend to 6nm out from coastal baselines, which, due to drying sandbanks, extends up to 15 miles offshore in some places.

- EC legislation sets a minimum landing size of 87mm for lobster in the UK and prohibits the landing of parts of lobsters.
- National legislation restricts the number of shellfish licences available in the UK and also prohibits the landing of lobsters with a v-notch in their tail fan.
- Local IFCA legislation varies and is detailed in the table below.

Table 1. Regional byelaws on East Anglia lobster fisheries.

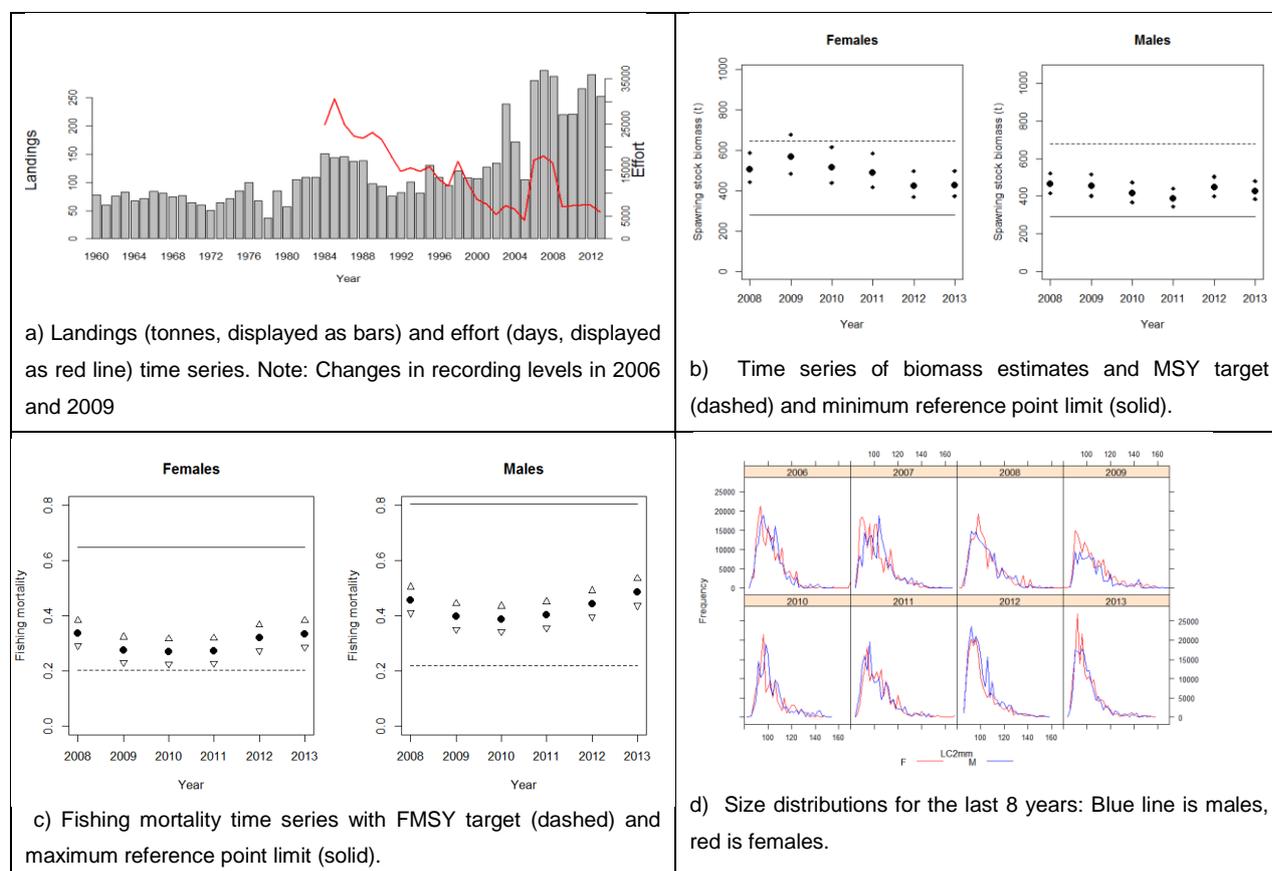
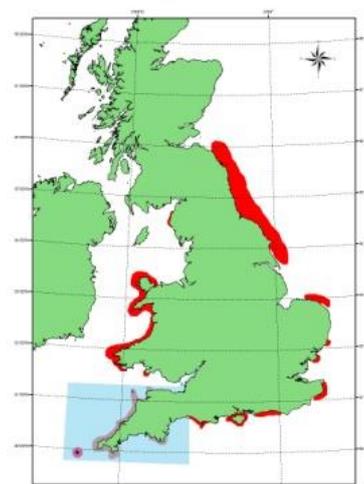
Title of Byelaw	Eastern	Kent & Essex
Shellfish Permits	Yes*	Yes
Minimum Landing Size	No	No
Maximum Pot Limit	No	No
Escape Gaps	Yes*	Yes
Maximum Vessel Length	No	Yes - 17M
Towed Gear Restrictions	No	No
Protection of Egg-Bearing Lobsters	Yes	Yes
Prohibits the Removal of Parts of Lobsters	Yes	Yes

\*Only applicable within the previous North Eastern Sea Fisheries Committee District

# Cefas Stock Status 2013: European lobster (*Homarus gammarus*) in the Southwest

## Sustainability Status

<b>Minimum Landing Size</b>	<i>At the MLS's applied in this region between 99-100% of the males and 86-92% of the females should be mature</i>
<b>Discarding</b>	<i>High discard survival assumed to be &gt; 90%</i>
<b>Stock size</b>	<i>Above minimum reference point limit but below MSY target</i>
<b>Exploitation rate</b>	<i>Moderate. Above rates consistent with MSY but below maximum reference point limit. Increasing in recent years</i>



**The status of the stock of lobster in the Southwest area is moderate; Spawning biomass levels are between the minimum reference point limit and the level associated with MSY but is decreasing, particularly for females. The exploitation level is between MSY target level and the maximum reference point limit for both sexes and has been increasing since 2010. The status of the stock has not changed since the last assessment in 2012.**

## Sampling levels

Table 2. Sample numbers collected for the southwest during the last three years.

Year	Samples used	No. animals sampled
2011	37	1642
2012	37	1846
2013	34	1537

## Fishery overview and developments

	2011	2012	2013
Fleet size <= 10m / >10 m	272/41	274/43	232/43
Effort (days fished) <=10m / >10m	14,781/7367	11,964/7332	9887/5557

Reported landings and fishing effort increased substantially following the introduction of Buyers and Sellers legislation and the Restrictive Shellfish License Scheme in 2006. Since this period fishing activity data are thought to be generally more reliable but the integrity of the time series, especially fishing effort, is uncertain. The figures above come from those vessels generating sales notes.

Fishing mortality (F) is consistently higher for males than females, and has been increasing for the last few years. F is currently above target levels for both sexes, but below the limit reference point. Officially reported landings have fluctuated in the past 5 years. Spawning stock biomass (SSB) has declined recently for females and remained fairly constant for males for several years.

Devon and Severn IFCA estimate the number of <10m vessels actively fishing in their district during 2013 was unchanged from previous years but the official data indicate a change in practice (fewer vessels generating sales notes). D&S IFCA also report no significant change in fishing effort (pots fished).

There is a distinct split in fishery practice with the larger (often vivier) boats operating outside the IFCA districts and therefore able to land berried females. The proportion of berried females in some landings is reported to be in excess of 60%. Those vessels operating predominantly within the IFCA areas will therefore have markedly different exploitation patterns designed to offer greater protection particularly to female spawning biomass.

## Fishery Management measures.

Devon & Severn IFCA jurisdiction applies between Lyme Regis and the River Tamar on the south coast and between Marsland Mouth and the Welsh border on the north coast and extend to 6nm out from coastal baselines. Cornwall IFCA jurisdiction applies between the River Tamar (including the western shore) and Marsland mouth, and extend to 6nm out from coastal baselines. Isles of Scilly IFCA byelaws apply to the 6nm boundary around the Isles of Scilly.

- EC legislation sets a minimum landing size (MLS) of 87mm for lobster in the UK, however, Devon & Severn, Cornwall, and Isles of Scilly IFCAs all enforce an MLS of 90mm. EC legislation also prohibits the landing of parts of lobsters
- National legislation restricts the number of shellfish licences available in the UK and also prohibits the landing of lobsters with a v-notch in their tail fan.
- Local IFCA legislation varies and is detailed in the table below. Devon & Severn IFCA (D&S) enforce a total fishing ban in the No Take Zone on the east coast of Lundy Island inside the Marine Protected Area (SAC and MCZ designation).

Table 1. Regional byelaws on southwest lobster fisheries.

Title of Byelaw	Devon & Severn	Cornwall	Isles of Scilly
Shellfish Permits	No	Yes	No
Minimum Landing Size	Yes – 90mm	Yes – 90mm	Yes – 90mm
Maximum Pot Limit	No	No	No
Escape Gaps	Yes	Yes	No
Maximum Vessel Length	Yes - 15.24M	Yes - 16.46M	Yes - 11M
Towed Gear Restrictions	Inshore Potting Agreement Area	No	No
Protection of Egg-Bearing Lobsters	Yes	Yes	No
Prohibits the Removal of Parts of Lobsters	No	No	No

## Glossary

Cefas	Centre for Environment, Fisheries and Aquaculture Science.
IFCA	Inshore Fisheries and Conservation Authority.
F	Fishing Mortality.
FMSY	The fishing effort which will produce Maximum Sustainable Yield.
M	Natural Mortality.
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MSY	Maximum Sustainable Yield, the maximum landings which can be regularly taken while avoiding stock collapse.
SAC	Special Area of Conservation
SpR	Spawner per Recruit



## About us

The Centre for Environment, Fisheries and Aquaculture Science is the UK's leading and most diverse centre for applied marine and freshwater science.

We advise UK government and private sector customers on the environmental impact of their policies, programmes and activities through our scientific evidence and impartial expert advice.

Our environmental monitoring and assessment programmes are fundamental to the sustainable development of marine and freshwater industries.

Through the application of our science and technology, we play a major role in growing the marine and freshwater economy, creating jobs, and safeguarding public health and the health of our seas and aquatic resources

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## Customer focus

We offer a range of multidisciplinary bespoke scientific programmes covering a range of sectors, both public and private. Our broad capability covers shelf sea dynamics, climate effects on the aquatic environment, ecosystems and food security. We are growing our business in overseas markets, with a particular emphasis on Kuwait and the Middle East.

Our customer base and partnerships are broad, spanning Government, public and private sectors, academia, non-governmental organisations (NGOs), at home and internationally.

We work with:

- a wide range of UK Government departments and agencies, including Department for the Environment Food and Rural Affairs (Defra) and Department for Energy and Climate Change (DECC), Natural Resources Wales, Scotland, Northern Ireland and governments overseas.
- industries across a range of sectors including offshore renewable energy, oil and gas emergency response, marine surveying, fishing and aquaculture.
- other scientists from research councils, universities and EU research programmes.
- NGOs interested in marine and freshwater.
- local communities and voluntary groups, active in protecting the coastal, marine and freshwater environments.

[www.cefasc.co.uk](http://www.cefasc.co.uk)

