

# • Technical Appendix

## A long-term East Anglian fisheries strategy

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Prepared for *Renaissance of East Anglian Fisheries*

August 2019

- This document provides background on data and analysis informing the
- Renaissance of East Anglian Fisheries Strategy Report

The data analysis and modelling informing the Renaissance of East Anglian Fisheries Strategy Report was conducted by Vivid Economics. Seafish provided data, data analysis as well as market expertise. The Marine Management Organisation (MMO) provided data.

All analysis is based on the latest available data. Data availability varies across data sources and sectors. The year of data is stated for all figures and tables.

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## **This strategy addresses how to support a flourishing coastal fleet and strengthen coastal communities in East Anglia**

While this work takes a holistic approach to understanding the regional sector and strategic opportunities, a number of sectors have been analysed with particular detail and are the main subject of this technical report.

- Catching
- Processing
- Aquaculture
- Sea Angling
- Infrastructure

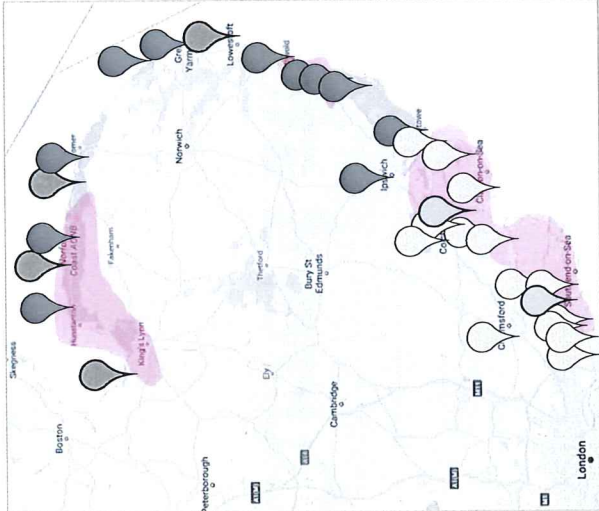
Three key areas of opportunity are assessed in this analysis.

- Stock management
- Economic Link
- UK exit from the Common Fisheries Policy

## Geographic project scope: Kings Lynn to Leigh-on-Sea

This analysis considers coastal regions between Kings Lynn and Leigh-on-Sea. For catching sector statistics, all active fishing ports within NUTS 2 regions East Anglia and Essex are considered East Anglian ports. For processing, all sites with postcodes CO, IP and NR were classified East Anglian processors. For aquaculture, all registered production businesses with postcodes within East Anglia and Essex (NUTS 2) are considered. This document uses the phrase East Anglia and Essex, short EAE, to describe the project region.

| Table 1. Fishing ports between Kings Lynn and Leigh-on-Sea<br>(NUTS2 East Anglia and Essex) |                 |                |
|---------------------------------------------------------------------------------------------|-----------------|----------------|
| Aldeburgh and Orford                                                                        | Harwich         | Walton-On-Naze |
| Blakeney                                                                                    | Ipswich         | Wells          |
| Bradwell                                                                                    | Kings Lynn      | West Mersea    |
| Brancaster Staithe                                                                          | Leigh-On-Sea    | Winterton      |
| Brightlingsea                                                                               | Lowestoft       | Wivenhoe       |
| Burnham-On-Crouch                                                                           | Maldon          |                |
| Canvey Island                                                                               | Pagelsham       |                |
| Clacton                                                                                     | Rochford        |                |
| Colchester                                                                                  | Sheringham      |                |
| Cromer                                                                                      | Sizewell Beach  |                |
| Felixstowe                                                                                  | Southend-On-Sea |                |
| Great Yarmouth                                                                              | Southwold       |                |



Note: Port locations and aquaculture activity mapped for illustration only, map may not reflect locations precisely  
Source: Google maps

# Current status by sector

- Catching
- Processing
- Aquaculture
- Sea Angling
- Infrastructure

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# The total value of catch from sea area around East Anglia and Essex (Southern North Sea (ICES Division 27.4.c)) is £220m, of which the UK lands £17m

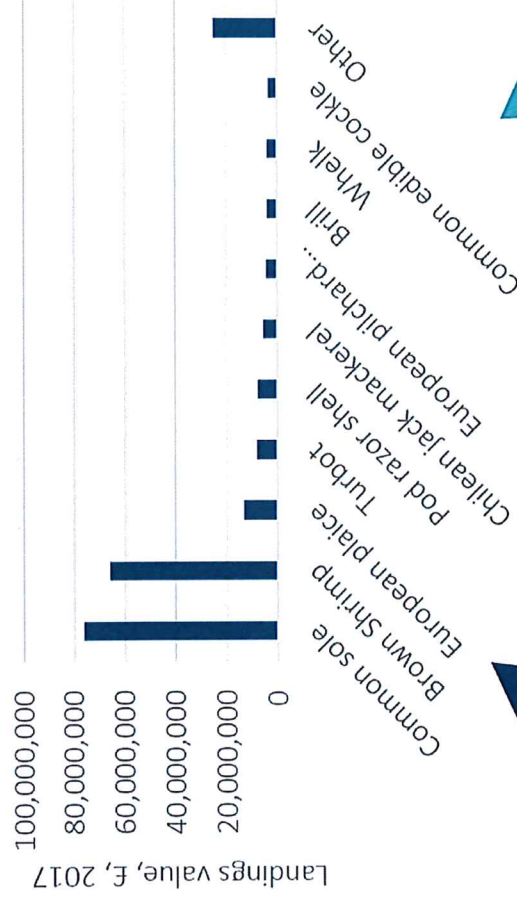
Figure 1. The sea area around East Anglia, Southern North Sea (27.4.c)



ICES sea areas delineate the divisions and subdivisions of FAO Major Fishing areas. ICES sea areas are used as bounding areas for calculating fish statistics and assessing stocks.

Source: Google Maps and FAO (left), STECF EU fleet landings 2017 (right), MMO 2017

Figure 2. Top species landed from 27.4.c in 2017 by value, STECF

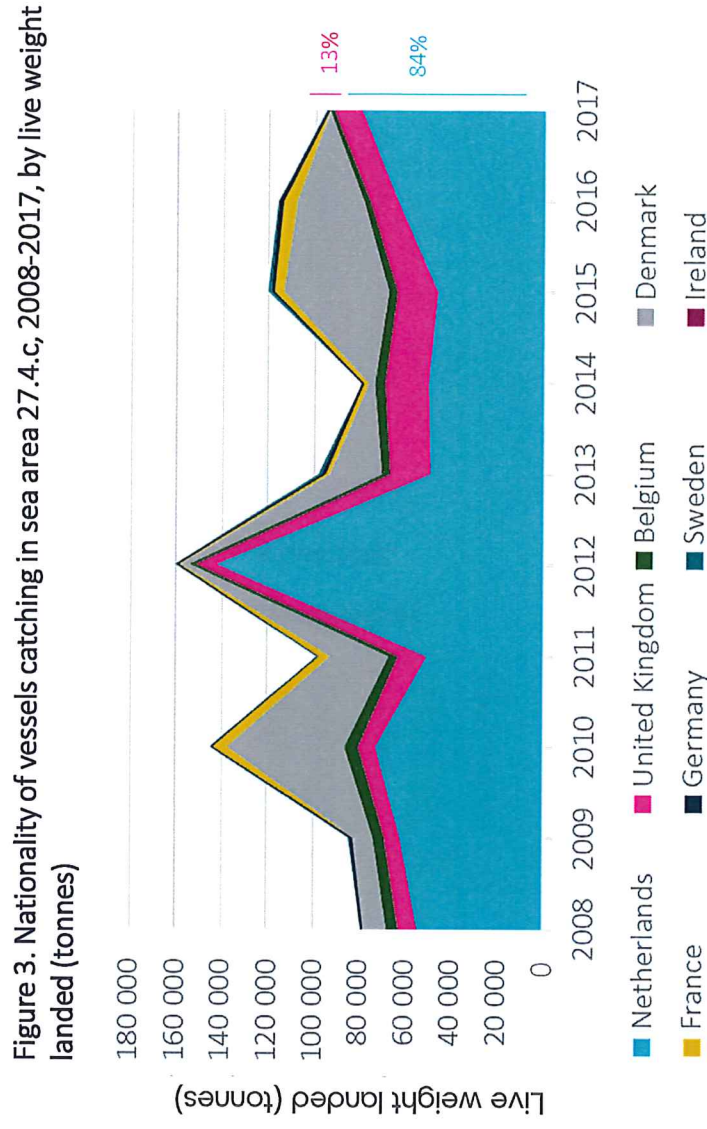


Total reported landings value from division 27.4.c in 2017 was €249 million, or £220 million.

The UK's share of landings value from 27.4.c in 2017 was ~£17m (7.5%) and EAE's share was ~£9m (4%).

The UK fleet accounted for 13% of landings volume from sea area 27.4.c in 2017

Total catch from sea area 27.4.c has seen significant changes over the last decade. In 2017, the Dutch fleet landed more than 84% of volume from 27.4.c, followed by the UK (13%), Belgium (2%) and Germany (1%).



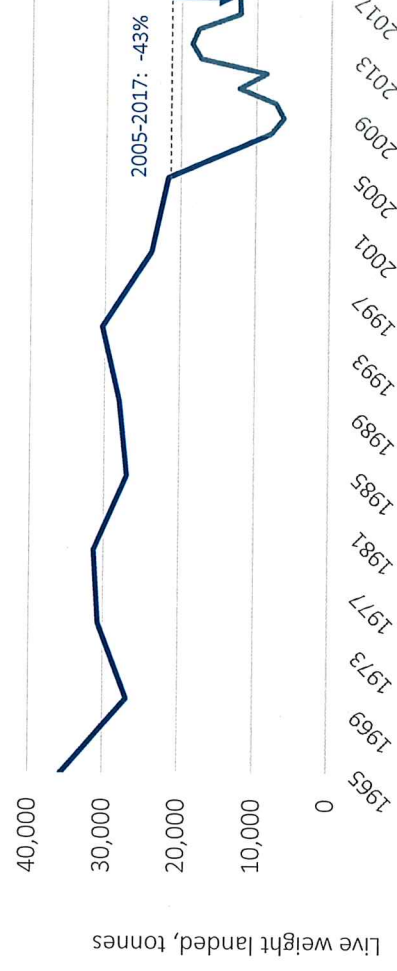
## East Anglian and Essex ports receive 63% of UK vessel landings value from the Southern North Sea

- Only 63% of UK landings value from 27.4.c are landed into ports in East Anglia and Essex, and less than 1% of UK landings value from sea areas 27.7.d and 27.4.b
- 13% of UK landings value from 27.4.c were landed into Dutch ports in 2018
- No landings of foreign vessels into ports in the region were registered in the last 5 years

## The volume of UK vessel landings from the Southern North Sea has been volatile in recent years

- The landings volume from sea area 27.4.c by UK vessels fell by 43% between 2005 and 2017 and has been volatile in recent years.
- The total number of fishermen in the UK fell from 12 800 to 11 700 (-9%) between 2005 and 2017.

Figure 5. Historic landings by UK vessels from 27.4.c, by tonnes live weight, ICES (1965-2008), STECF (2008-2017)



The yellow shaded area indicates a change of data source.

Note: Figure 5 combines two data sources for historic landings that may apply different assumptions, the break is highlighted by a shaded background.  
Source: UK sea fisheries annual statistics 2005 and 2017, ICES historic landings, STECF EU fleet landings

## For this analysis, we group vessels into shellfish fleet, inshore fleet, offshore fleet, low activity fleet

| Offshore fleet                                                                                                                                                                                                                                                                                       | Inshore fleet                                                                                                                                                                                                                                                             | Shellfish fleet                                                                                                                                                                            | Low activity fleet                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>Criteria:</b><br/>Vessel length above 14m or vessel length above 13m and total annual fishing income &gt;£200,000.<br/>Top species targeted is not shellfish, total annual fishing income &gt;£10,000.</p> |  <p><b>Criteria:</b><br/>Vessel length below 14m and total annual fishing income &lt;£200,000.<br/>Top species targeted is not shellfish, total annual fishing income &gt;£10,000.</p> |  <p><b>Criteria:</b><br/>Top species targeted is shellfish, total annual fishing income &gt;£10,000.</p> |  <p><b>Criteria:</b><br/>Total annual fishing income &lt;£10,000.</p> |

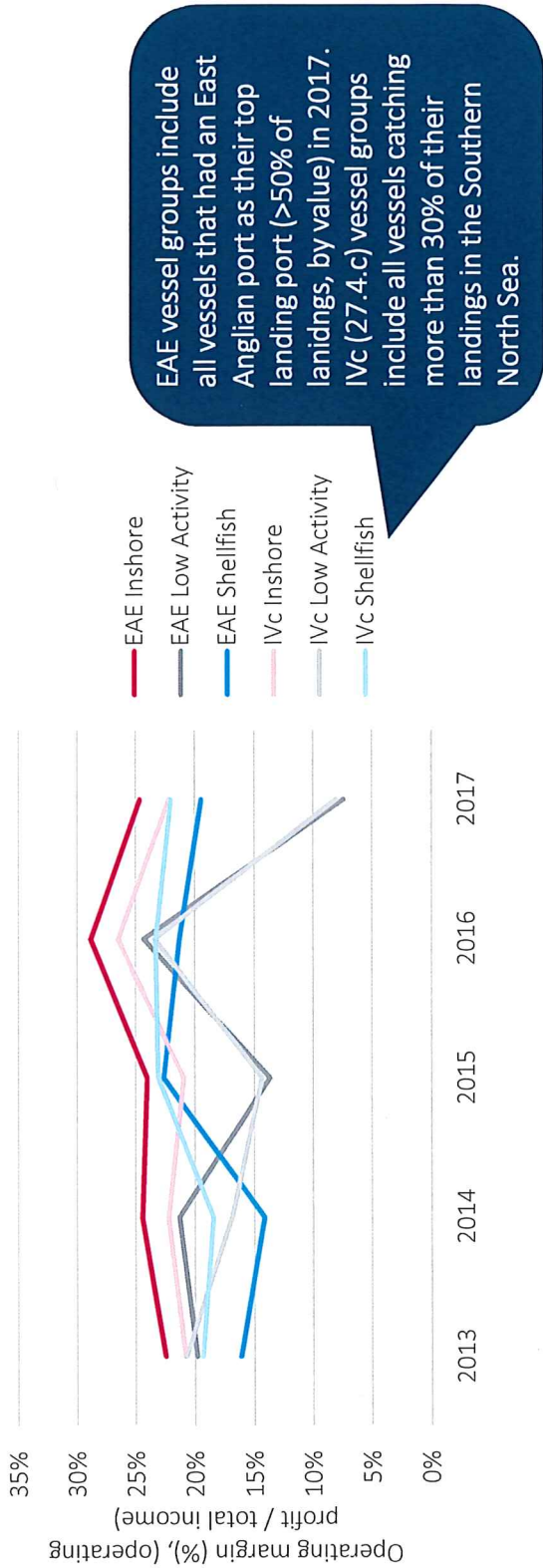
## A closer look at the fleet catching in the Southern North Sea (27.4.c) in 2017: Vessel groups target specific species

| Offshore fleet                                                                                                       | Inshore fleet                                                                                                                                                                                                                                                                                                        | Shellfish fleet                                                                                                                                                                                                                                                                                                                        | Low activity fleet                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Sole</b><br/>2 specialised vessel, 1 semi specialised vessel, 1.9M£ total landings</p> <p><b>Plaice</b> 0.3M£<br/><b>Red Mullet</b> 0.2M£<br/><b>Turbot</b>, 0.2M£<br/><b>Mackerel</b>, 0.1M£</p> | <p><b>Sole</b><br/>18 specialised vessel, 21 semi specialised vessel, 0.8M£ total landings</p> <p><b>Bass</b><br/>11 specialised vessel, 14 semi specialised vessel, 0.4M£ total landings</p> <p><b>Cod</b>, 4 specialised vessel, 16 semi specialised vessel, 0.3M£ total landings</p> <p><b>Thornback Ray</b>, 0.2M£<br/><b>Lobsters</b>, 0.1M£<br/><b>Plaice</b> 0.1M£<br/><b>Herring</b> 0.01M£</p> | <p><b>Cockles</b><br/>12 specialised vessel, 3 semi specialised vessel, 3.5M£</p> <p><b>Whelks</b><br/>30 specialised vessel, 4 semi specialised vessel, 3.0M£</p> <p><b>Brown Shrimps</b><br/>26 specialised vessel, 4 semi specialised vessel, 2.6M£</p> <p><b>Lobster</b><br/>17 specialised vessel, 18 semi specialised, 1.0M£</p> <p><b>Crabs</b><br/>12 specialised vessel, 20 semi specialised vessel, 0.6M£</p> | <p>Species targeted include <b>Sole</b> (0.1M£), <b>Lobsters</b> (0.1M£), <b>Bass</b> (0.1M£), <b>Brown Shrimp</b> (0.1M£), <b>Thornback Ray</b>, <b>Cod</b> and <b>Crabs</b></p> |

Note: A vessel is categorised as specialised on one species if >50% of its landings come from the species. A vessel is categorised as semi specialised, if 20%-50% of its landings come from the species.  
Source: MMO 2017

## Vessel groups operate with margins between 15% and 25%, low activity vessels tend to have lower margins

Figure 6. Key trends in operating margin by vessel group

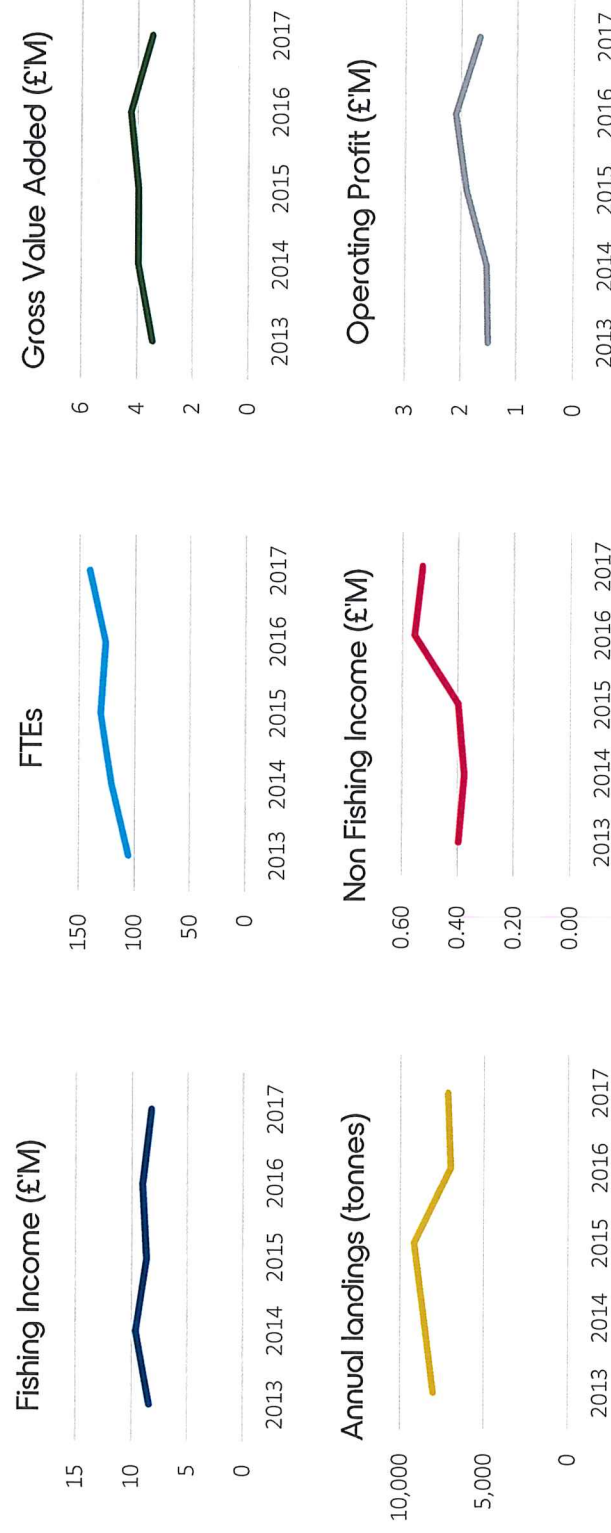


Operating margins are defined as operating profits over revenues. Operating margins need to be sufficiently high to fund replacement of assets and additional investments.

## Despite decreasing landings, employment has gone up

Decreases in landings and unchanged fishing income suggest slight increases in prices over the last 5 years. Operating profit has gone down as employment increased in 2017.

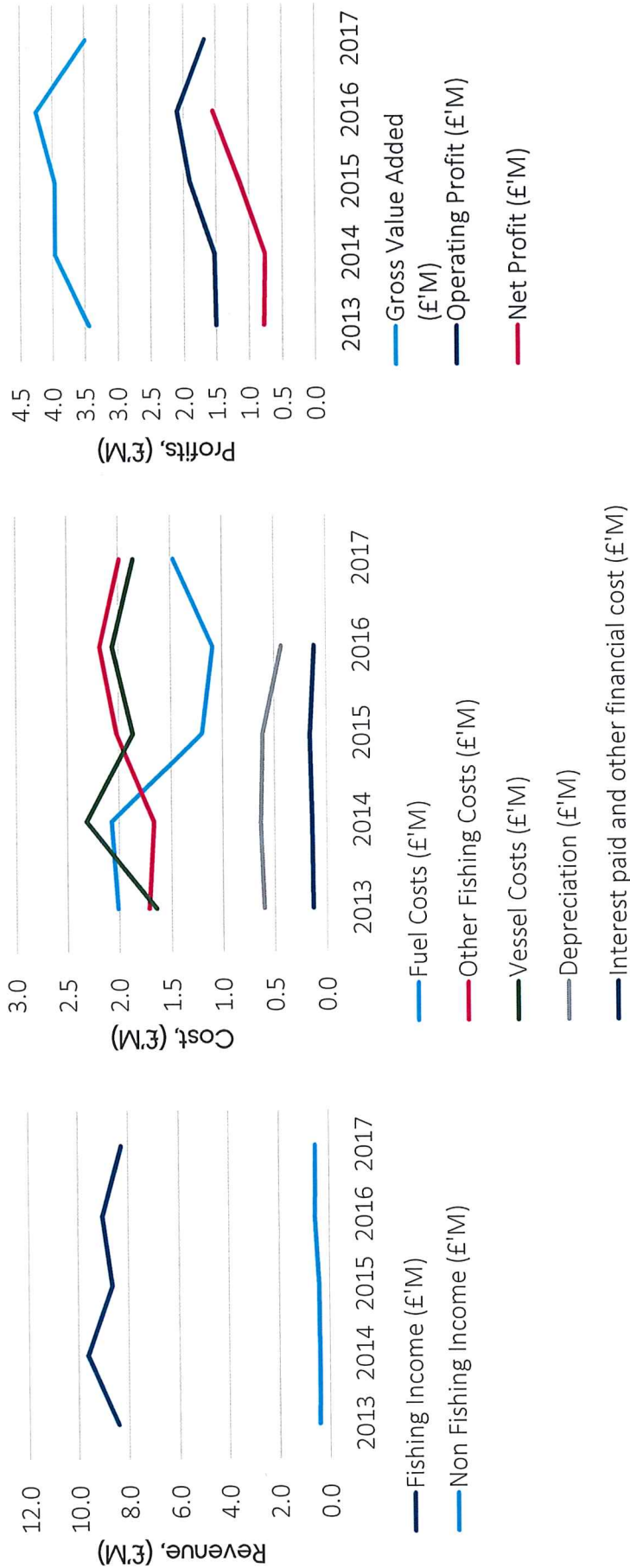
Figure 7. Key trends in fleet performance, EAE fleet, 2013-2017



Source: Seafish Fleet Economic Performance 2013-2017

## Fuel costs seem to play an important role for operating profits of the fleet

Figure 8. Key trends in fleet performance, EAE fleet, 2013-2017

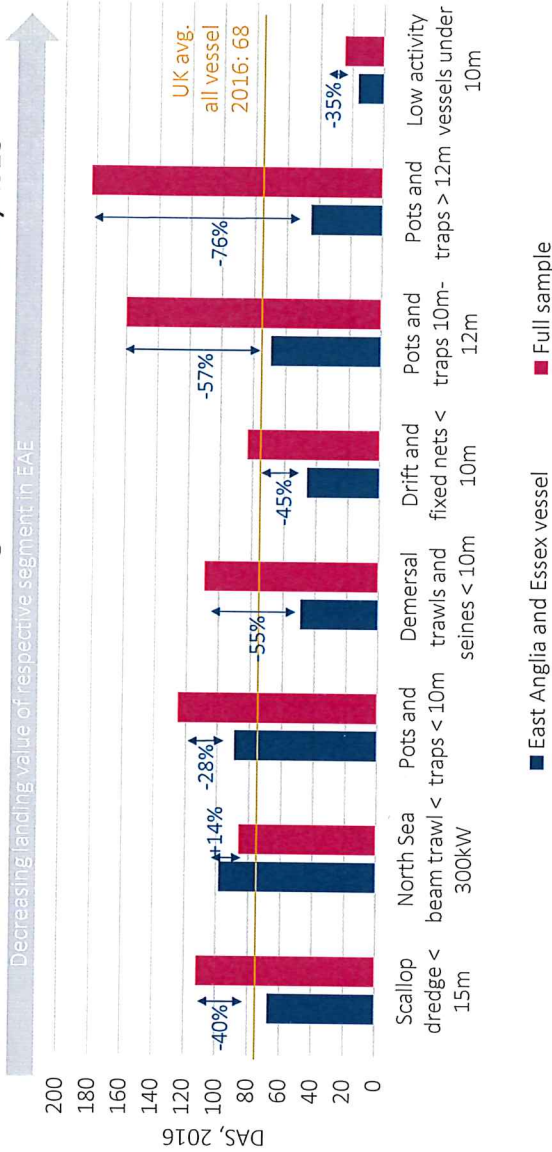


Source: Seafish Fleet Economic Performance 2013-2017

## Regional vessels spend fewer days at sea than comparable vessels in other regions in the UK

- Vessels in 6 of the 7 top vessel segments by landing value in East Anglia and Essex operate 28% to 76% below UK average DAS for that segment.
- The difference appears to be especially large for pots and traps

Figure 9. Average days at sea by vessel segment for EAE and UK fleet, 2016

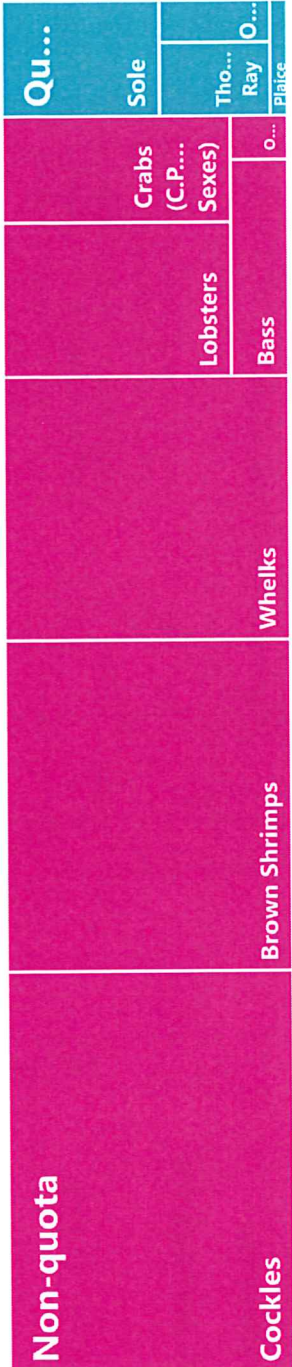


This analysis is based on reported voyage lengths of vessels. MMO landings data may not always be accurate with regards to length of voyage. This analysis is therefore only indicative.

## Only 9%-13% of landings into regional ports are quota landings

2018  
£9.5M landings value  
landed into East Anglian  
and Essex ports  
9% quota stocks

Figure 10. Split up of value of landings into regional ports by species, 2018

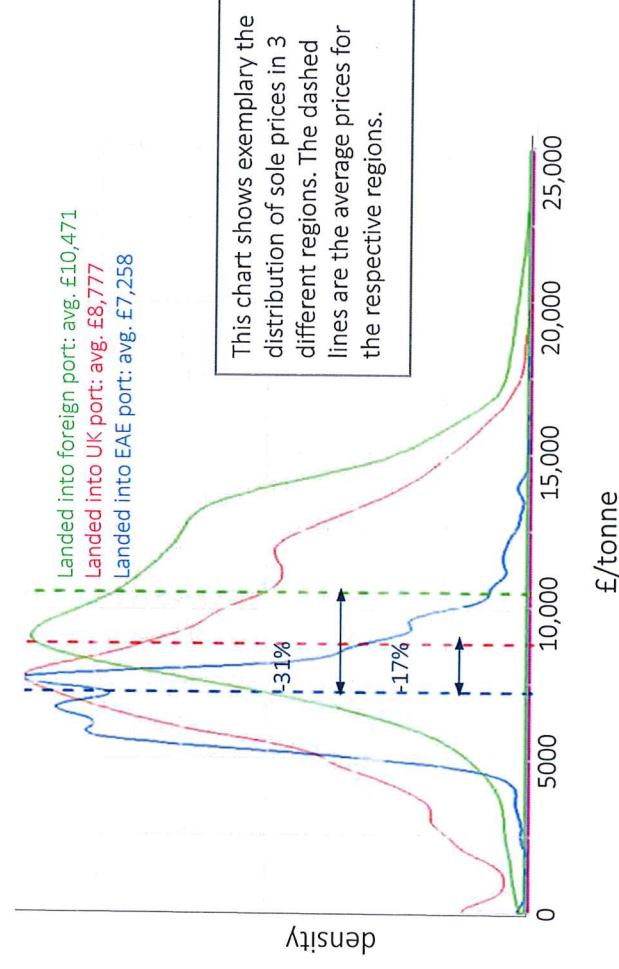


Source: MMO 2018 (preliminary)

## Some species landed into the region are sold at lower prices than UK average prices

- Average prices for catch landed into EAE are lower than UK average for sole, whelks, cockles and brown shrimps.
- Prices correspond to the UK average for lobsters.
- Prices are above UK average for skates and rays, cod and bass.
- Catch landed into Lowestoft shows higher average prices than the UK for bass, cod and turbot.

Figure 11. Avg. price realised for Sole by UK vessel in 2016 by landing reg., £/tonne



This analysis is based on reported value of species landed. MMO landings data may not always be accurate with regards to prices. This analysis is therefore only indicative.

## Areas of pressure identified in stakeholder interviews include recruitment, infrastructure and accessibility of the resource

- **Recruitment** Low levels of recruitment into the industry
- **Port and road infrastructure**
  - Lack of facilities to lift out boats for maintenance
  - Travel times to motorway network, and availability of low-cost transportation
  - Limited access to specialist engineers for vessel repairs and maintenance, despite likely increasing demand due to updates to vessel monitoring systems and catch reporting
- **Accessibility of fish** Competition for access to fishing grounds with renewable energy, cables, marine protected areas

## A comparison of economically most important stocks to EAE, the UK and 27.4.c

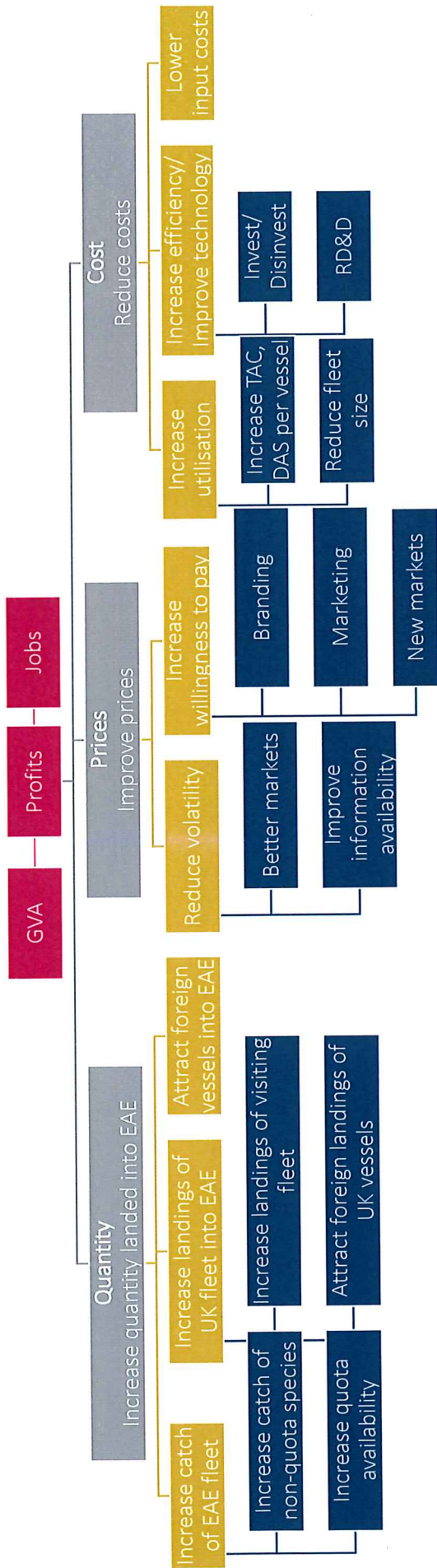
Table 2. Selection criteria for species in focus of strategy

| Value landed into EAE (2016) |       | UK value caught in 27.4.c<br>(current potential) (2016) | Total value caught in 27.4.c<br>(future potential) (2017) |                |
|------------------------------|-------|---------------------------------------------------------|-----------------------------------------------------------|----------------|
| Cockles                      | 25.9% | Cockles                                                 | 20.4%                                                     | Sole →         |
| Brown Shrimps                | 24.3% | Whelks                                                  | 19.1%                                                     | Brown Shrimp → |
| Whelks                       | 17.5% | Sole                                                    | 16.8%                                                     | Plaice ↘       |
| Lobsters                     | 8.6%  | Brown Shrimps                                           | 15.5%                                                     | Turbot ↗       |
| Sole                         | 7.9%  | Lobsters                                                | 7.1%                                                      | Pilchard ↗     |
| Crabs                        | 5.8%  | Crabs                                                   | 3.7%                                                      | Brill →        |
| Bass                         | 4.1%  | Bass                                                    | 3.2%                                                      | Whelks ↗       |
| Cod                          | 2.2%  | Plaice                                                  | 2.3%                                                      | Cockles ↘      |
| Other                        | 3.7%  | Other                                                   | 11.9%                                                     | Other          |

Note: Arrows on the right indicate recent species trend in area lvc.

Source: MMO 2016, STECF 2017

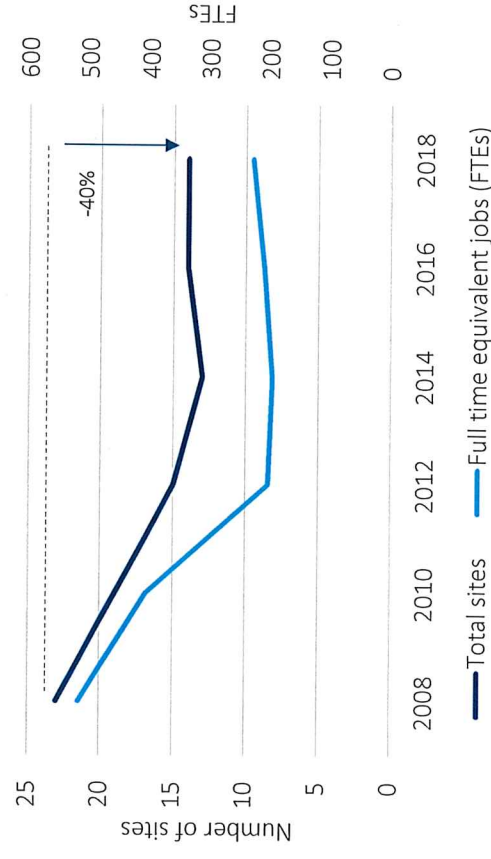
## Opportunities for the catching sector



Enabling environment: regulation, stock management, infrastructure

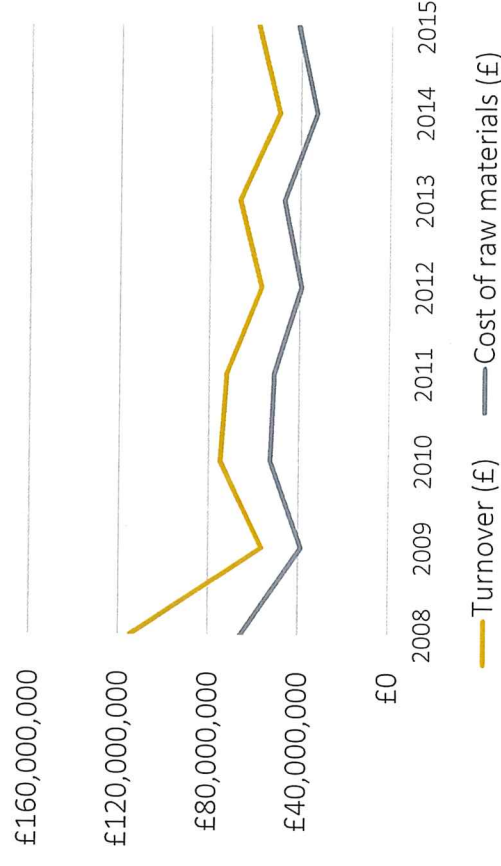
## The processing sector has decreased in size

Figure 12. Number of processing sites and employment in processing in East Anglia 2008-2018



Data on processing is limited but suggests that number of sites fell by 40% (from 23 to 14) in the last decade.

Figure 13. Turnover and raw material costs in processing in East Anglia 2008-2015



Processing financial figures are nominal and have not been adjusted for inflation

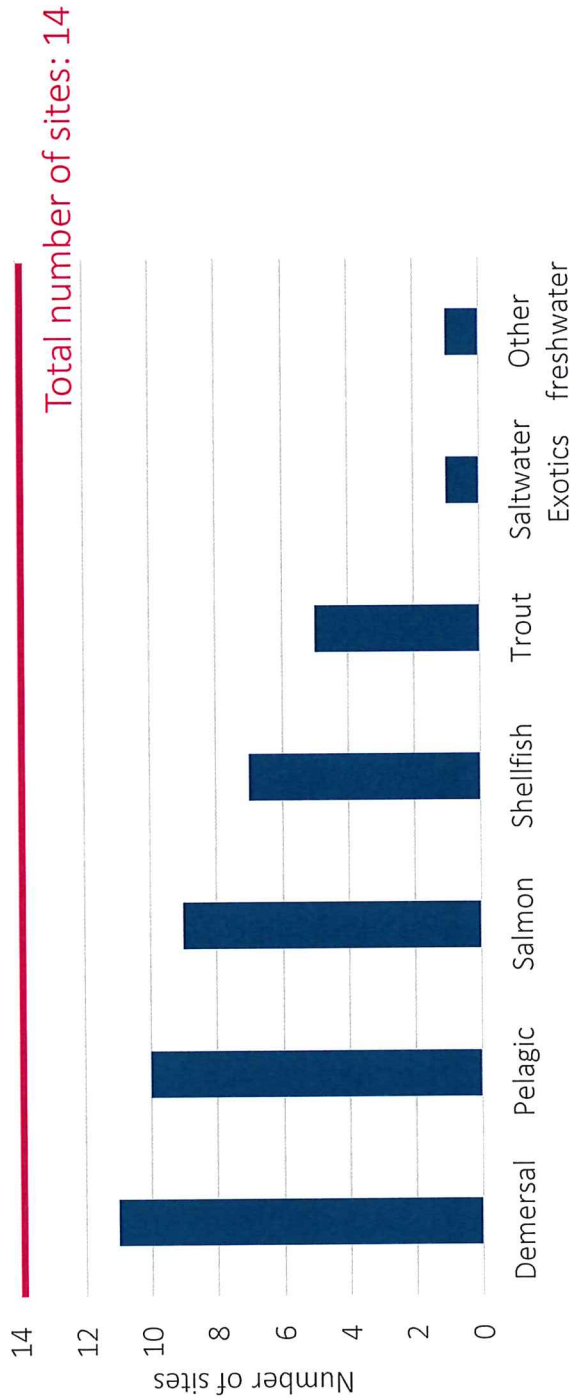
Note: All sites with postcodes CO, IP and NR were classified East Anglian processors. Note that time horizon on both graphs is unequal due to data availability. Analysis only covers sites that are defined as majority fish processors in the Seafish biennial census. Majority processors are defined as those with 50 percent or more of their turnover from fish processing in a given year (as opposed to trading, wholesaling, retailing, importing, exporting, etc.). 2018 figures are preliminary.

Source: Seafish processing sector census 2008-2018 and processing financial survey 2008-2015

## Not all processing sites in the region process demersal, pelagic and salmon

This data is only available to us on an aggregate level. Any site may be processing multiple fish types. A certain degree of specialisation of processing sites is likely given the data.

Figure 14. Fish types processed in East Anglian processing sites, 2018

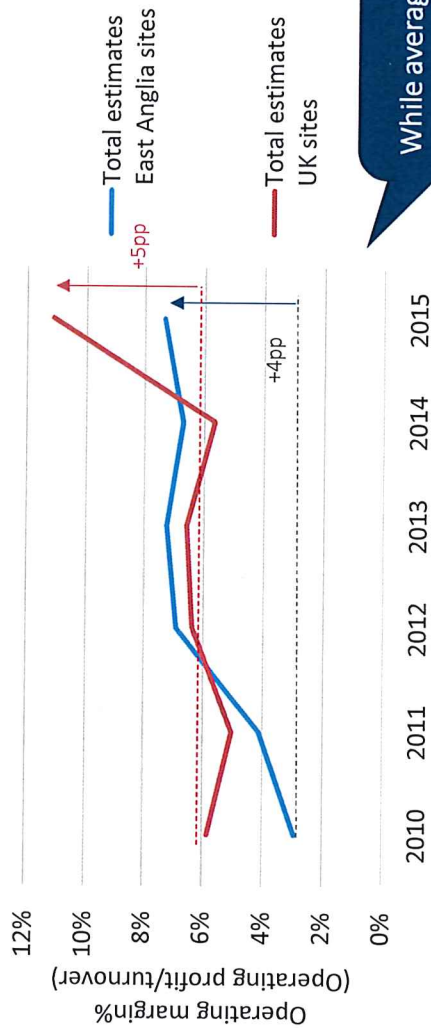


Note: All sites with postcodes CO, IP and NR were classified East Anglian processors. Analysis only covers sites that are defined as majority fish processors in the Seafish biennial census. Majority processors are defined as those with 50 percent or more of their turnover from fish processing in a given year (as opposed to trading, wholesaling, retailing, importing, exporting, etc.). 2018 figures are preliminary.

Source: Seafish processing sector census 2018

## Processing sites in East Anglia and Essex operate with low margins

Figure 15. Operating margins in the processing sector by region, 2009-2015

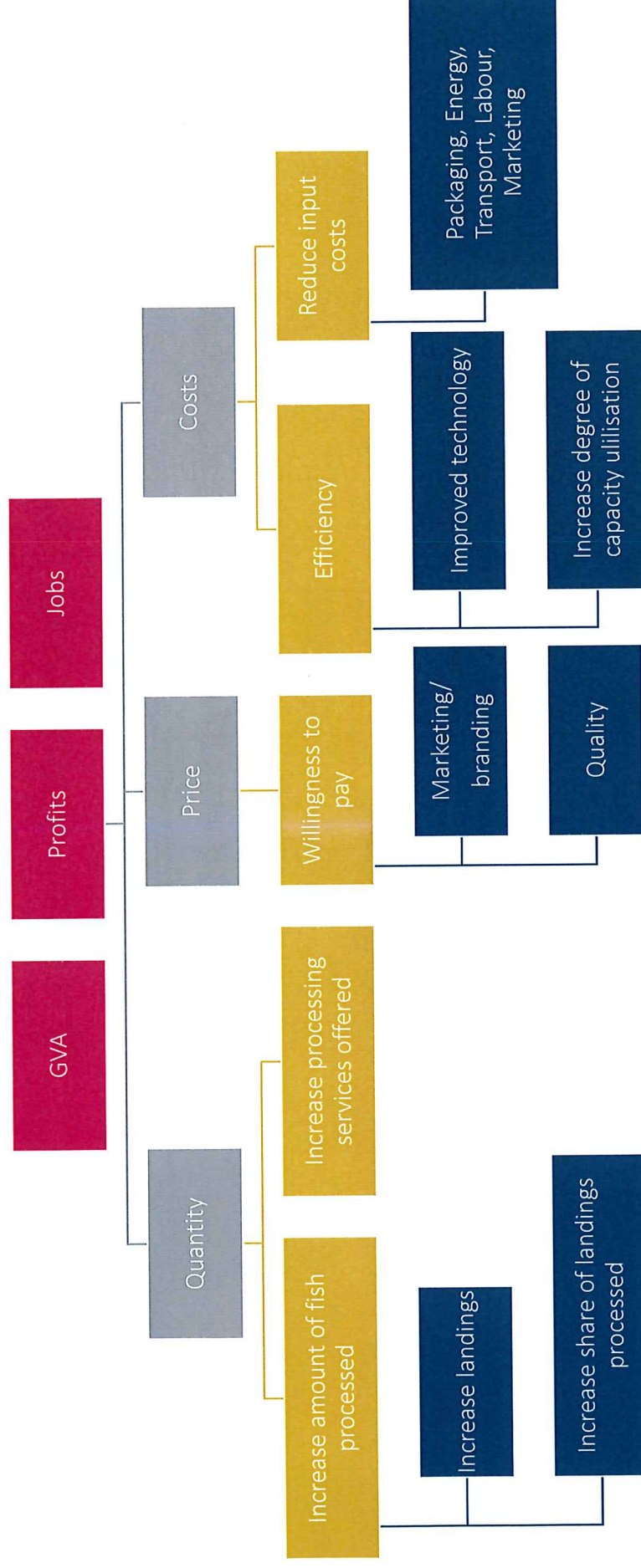


While average processing margins have increased in the last few years, they are generally low (<8%).

**Operating margins** are defined as operating profits over revenues. Operating margins need to be sufficiently high to fund replacement of assets and additional investments.

Note: All sites with postcodes CO, IP and NR were classified East Anglian processors. Analysis only covers sites that are defined as majority fish processors in the Seafish biennial census. Majority processors are defined as those with 50 percent or more of their turnover from fish processing in a given year (as opposed to trading, wholesaling, retailing, importing, exporting, etc.). 2018 figures are preliminary. Financial data is collected annually from a sample of company accounts and publicly available financial accounts. For EA and Essex, the sample covers between 10% and 30% of all sites every year. The methodology of the Seafish processing financial survey is currently under revision.  
Source: Seafish processing financial survey 2010-2015

## Opportunities: Processing

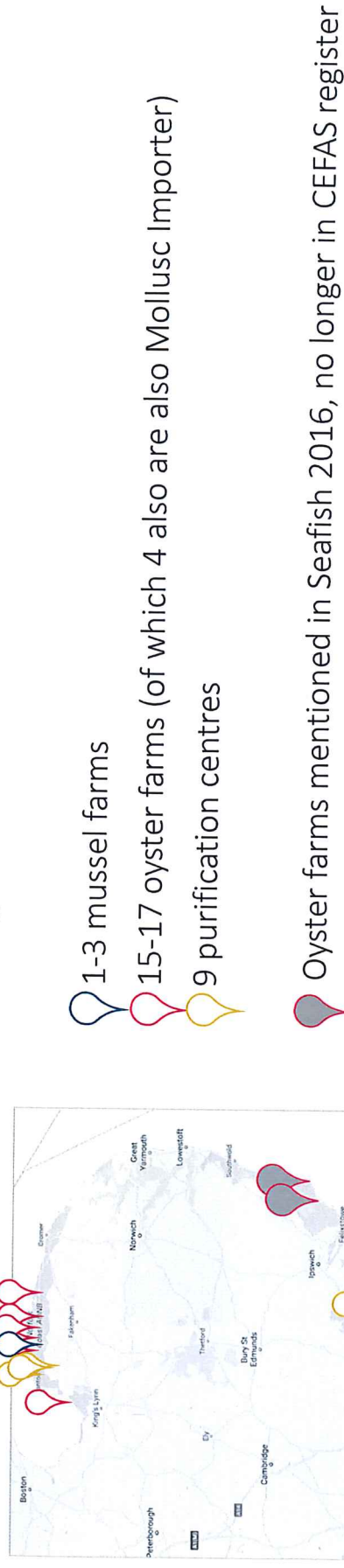


Source: Vivid Economics

## Aquaculture in East Anglia and Essex is limited to oyster and mussel farms

This analysis of the aquaculture sector of East Anglia and Essex (EAE) considers commercial saltwater fish farms in the region. According to the CEFAS registry of UK aquaculture farms, all registered saltwater aquaculture farms in EAE can be classified as Mollusc Farm, Mollusc Importer and/or Mollusc Purification centre.

Figure 16. CEFAS registered saltwater fish farms in East Anglia and Essex



*This list is indicative could not fully be confirmed in interviews*

Note: Oyster farms and purification centres may be affiliated, often in close proximity  
Source: CEFAS Register for Aquaculture, accessed February 2019

Disparity between Seafish and STECF data may be explained by STECF including hatcheries, purification centres,...  
Furthermore Seafish data specifically for the table market.

## The total turnover of the EAE AQ sector is between £1 and 2 million

Table 3. Estimates for the size of the EAE aquaculture sector

| OYSTER FARMS             | England, Wales and NI total Seafish 2016 | UK total EU STECF 2014                                    | East Anglia and Essex lower                                 | East Anglia and Essex upper                                 |
|--------------------------|------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| Production               | 1 200 tons                               | 1 588 tons                                                | 280 tons*                                                   | 400 tons*                                                   |
| Turnover (£)             | 4.6 million                              | 4.8 million                                               | 1.1 million*                                                | 1.27 million*                                               |
| Employment (FTE, direct) | 184                                      | 169                                                       | 20*                                                         | 35*                                                         |
| GVA (million £)          | 2.3 million                              |                                                           | 0.43 million*                                               | 0.56 million*                                               |
| Number of businesses     | 36                                       | 87                                                        | 15-17                                                       | 15-17                                                       |
| Size bands               |                                          | 71 businesses <5 employees,<br>6 businesses >10 employees | No EAE among largest in UK,<br>likely all below 5 employees | No EAE among largest in UK,<br>likely all below 5 employees |
| MUSSEL FARMS             | England, Wales and NI total Seafish 2016 | UK total CEFAS 2014                                       | East Anglia and Essex lower                                 | East Anglia and Essex upper                                 |
| Production               | 20 000 tons                              | 20 000 tons                                               | 500 tons*                                                   | 1000 tons*                                                  |
| Turnover (£)             | 10 million -20 million (highly variable) | 34 million                                                | 0.5 million*                                                | 0.7 million*                                                |
| Employment (FTE, direct) | 125                                      | 293                                                       | 4-9*                                                        | 4-9*                                                        |
| GVA (£)                  | 6-12 million                             | 17.8 million                                              | 0.3 million*                                                | 0.4 million*                                                |
| Number of businesses     | 25                                       | 116                                                       | 1-3                                                         | 1-3                                                         |
| Size bands               |                                          | 69<5 employees                                            | No EAE among largest in UK,<br>likely all below 5 employees | No EAE among largest in UK,<br>likely all below 5 employees |

Notes: \*indicates estimates, assumed national averages per employee and smaller than UK average business size

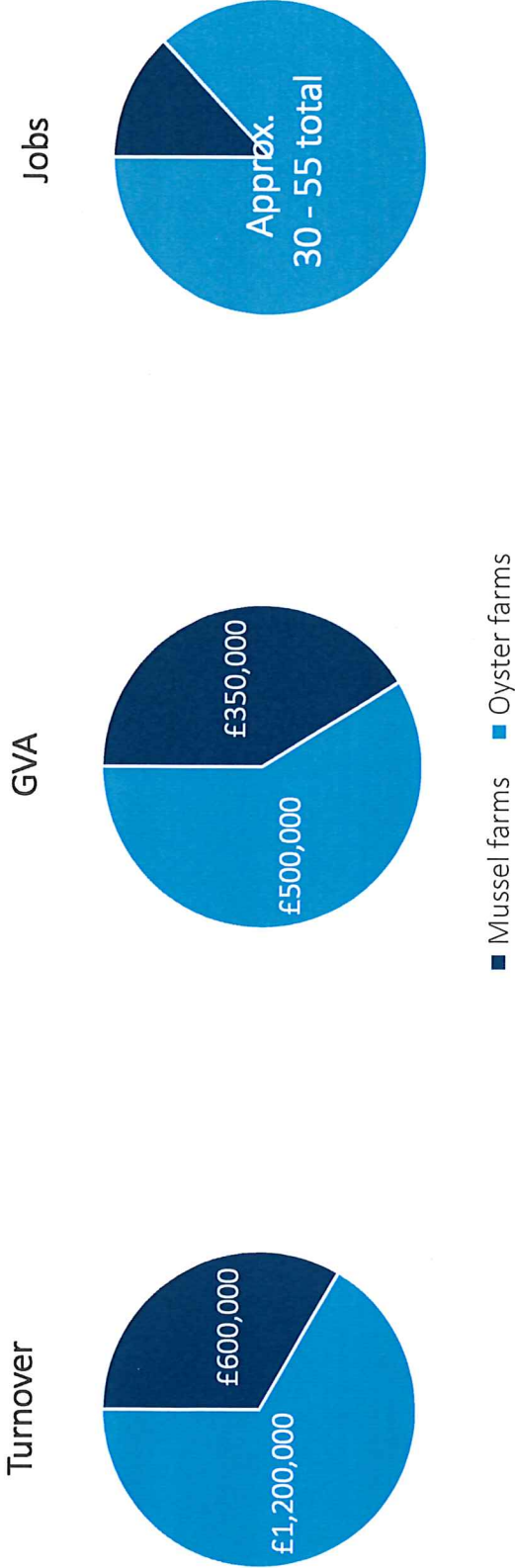
Source: Seafish Aquaculture in England, Wales and Northern Ireland 2016; EU Scientific, Technical and Economic Committee for Fisheries (STECF) 2016 Aquaculture sector data call

## Scale of the aquaculture sector in East Anglia and Essex

Saltwater aquaculture farms in East Anglia and Essex include oyster farms, purification centres and mussel farms. The role of seaweed production will be determined in interviews.

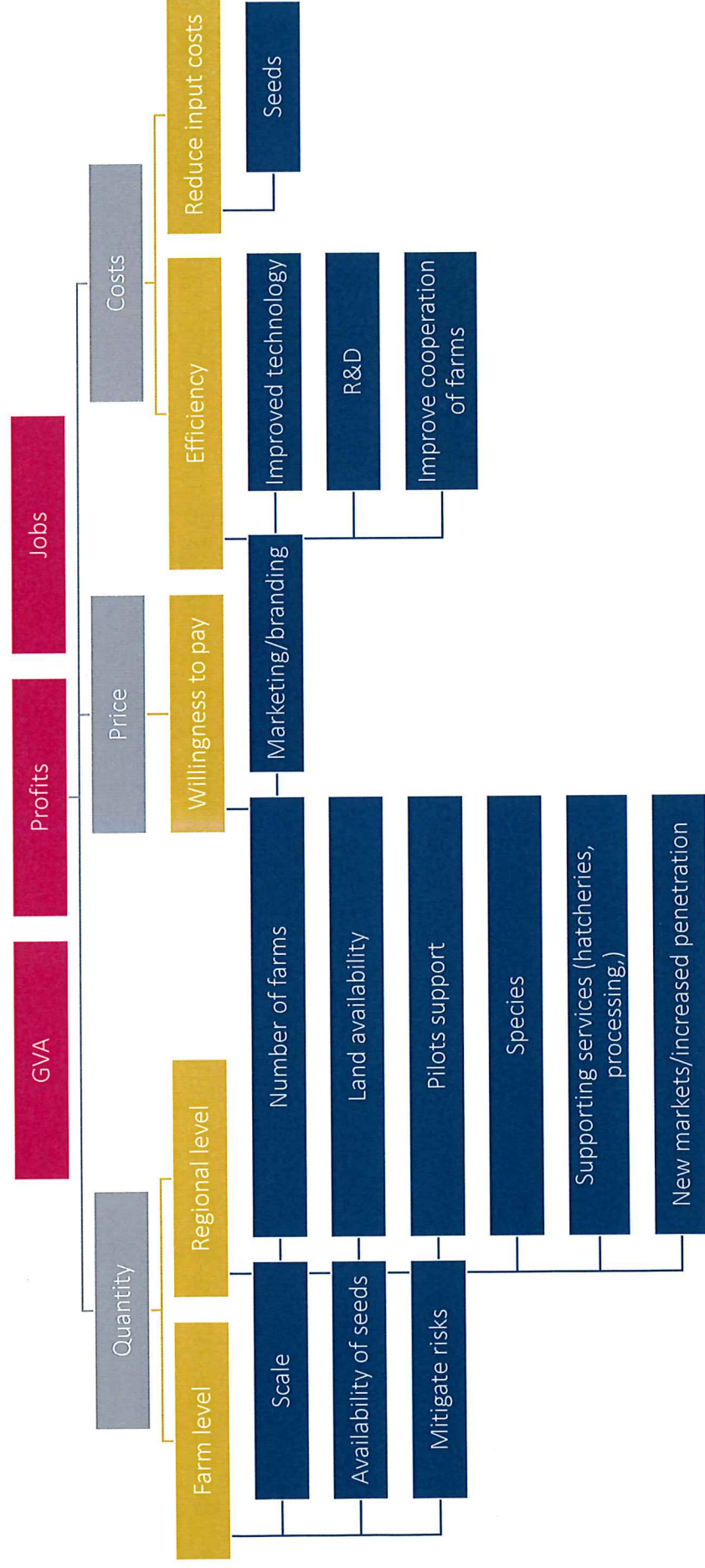
Estimates are based on number of farms in EAE and the assumption all farms are <5 FTE.

Figure 17. GVA and Production from saltwater aquaculture farms in EAE by type, *estimates only*



Note: Oyster farms and purification centres may be affiliated, often in close proximity  
Source: Vivid Economics estimates based on CEFAS Register for Aquaculture and Seafish Aquaculture in England, Wales and Northern Ireland 2016; EU Scientific, Technical and Economic Committee for Fisheries (STECF) 2016 Aquaculture sector data call

## Opportunities: Aquaculture



## Sea Angling is difficult to quantify given current level of reporting requirements

- Revenue of the sea angling sector is split between multiple beneficiaries including charter boats, equipment, services, licences and hospitality
- It is not known how many people in East Anglia engage in sea angling nor how much they spend on these activities. Anecdotal evidence does not seem to agree with the main previously published study on the topic. We conclude that the data on sea angling are not reliable and that the figures below should not be relied upon.
- Total current spending on sea angling in East Anglia and Essex could be as high as 19M£.\*
- Total current direct FTE supported could be as high as 240 FTE.\*
- Spendings consist of trip spendings (approximately 55%) and spendings % major items (approximately 45%).
- Approximately 70% of reported spendings would necessarily be spent locally, the remaining 30% may be spent online or in advance of the trip

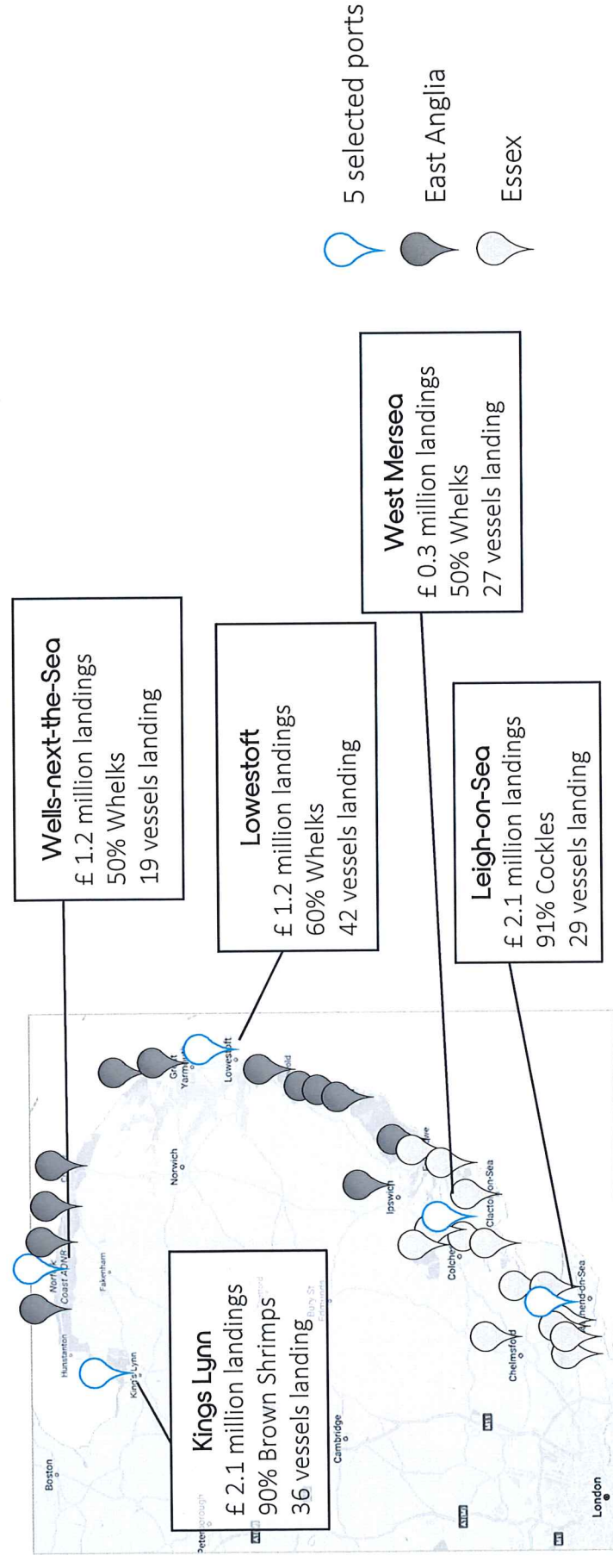
**Limitations:** Values are estimates for aggregated trip spending in East Anglia, based on national averages reported in DEFRA 2012, scaled to EAE based on survey results reported for Lowestoft. Estimates could not be verified in interviews with the local community.

Source: Vivid analysis based on DEFRA 2012 Sea Angling Report

## East Anglian and Essex ports have regional differences in key species and level of specialisation

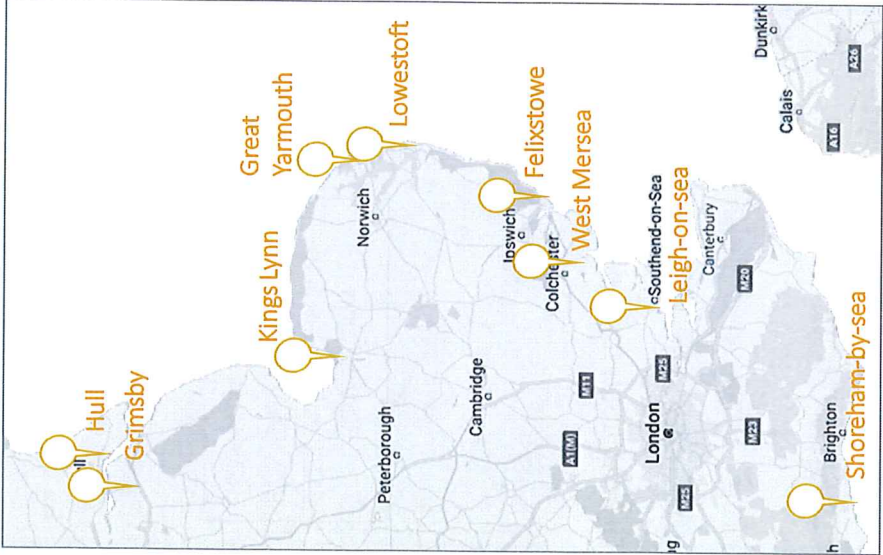
Kings Lynn and Leigh-on-Sea are highly specialised on Brown Shrimps and Cockles respectively, Whelks are important for Wells and Lowestoft.

Figure 18. Selected ports in East Anglia and Essex, annual landings value and top species, 2017



Note: Port locations mapped for illustration only, map may not reflect locations precisely. Count of vessels landing includes low activity vessels.  
Source: MMO 2017

# Shoreham-by-sea, Hull and Grimsby are competitor ports to East Anglian ports



Note: Port locations mapped for illustration only, map may not reflect locations precisely  
Source: MMO 2016, UK sea fisheries statistics 2017

Table 4. Selected ports in East Anglia and Essex and main competitor ports, 2017

|                 | Landings,<br>M£ (2017) | UK Vessel excl. low activity<br>(2016)<br>(offshore-inshore-shellfish) | Top species (2017)     |
|-----------------|------------------------|------------------------------------------------------------------------|------------------------|
| Lowestoft       | 1.2                    | 35 (2-13-8)                                                            | Whelks (60%)           |
| Kings Lynn      | 2.1                    | 44 (0-1-31)                                                            | Brown Shrimps<br>(90%) |
| West Mersea     | 0.4                    | 32 (0-11-1)                                                            | Whelks (50%)           |
| Felixstowe      | 0.3                    | 23 (0-9-1)                                                             | Sole (42%)             |
| Great Yarmouth  | 0.2                    | 6 (1-0-2)                                                              | Plaice (35%)           |
| Leigh-on-sea    | 2.1                    | 34 (0-6-12)                                                            | Cockles (91%)          |
| Grimsby         | 8.3                    | 31 (3-1-15)                                                            | Crabs (45%)            |
| Shoreham-by-sea | 11.9                   | 69 (7-15-30)                                                           | Scallops (58%)         |
| Hull            | 3.6                    | 5 (0-0-4)                                                              | Lobsters (81%)         |

## The EAE visitor fleet also lands into the Netherlands and France

Figure 19. Top alternative landing ports of vessels also landing into East Anglian ports, by economic importance, 2017



- Port of landing of EAE main fleet (top 3 on map)
- Port of landing of EAE visitor fleet (top 9 on map)

Total landings into alternative ports by EAE main fleet in 2017: £ 0.2 million

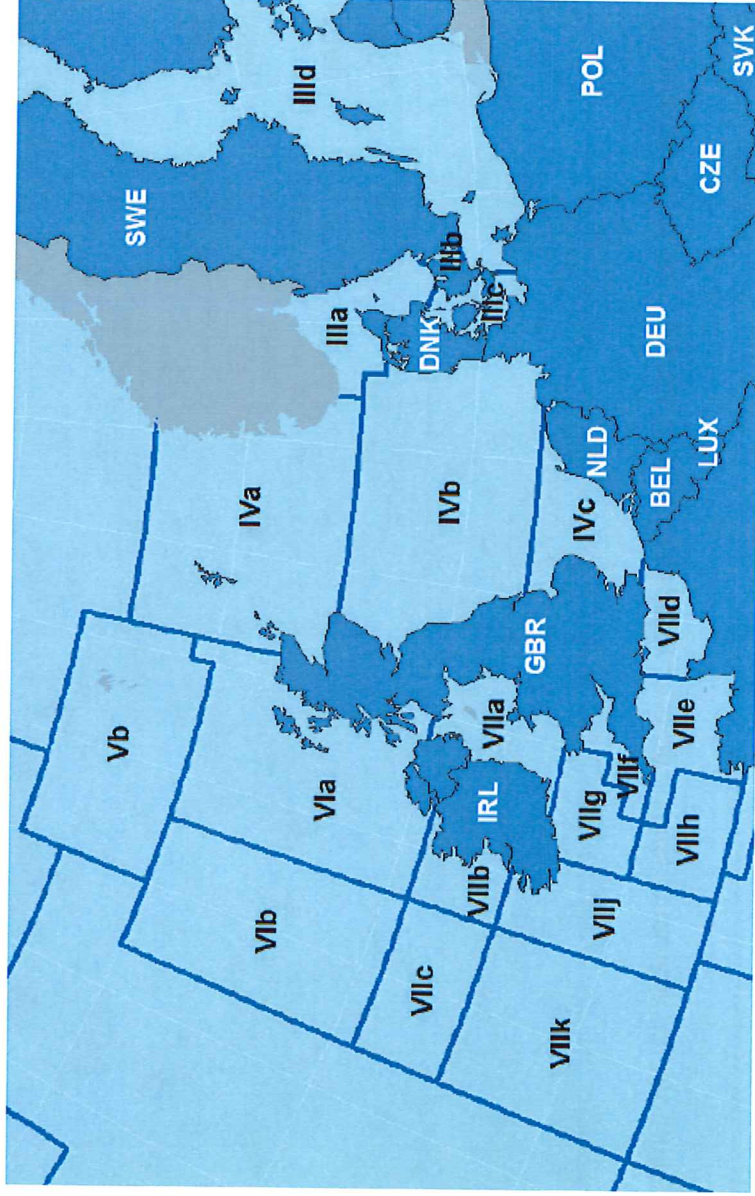
Total landings into alternative ports by EAE visitor fleet in 2017: £ 7.3 million

We define vessels landing at least 50% of their catch into East Anglian ports as EAE main fleet, vessels landing any value into EAE ports but less than 50% of their catch are classified visitor fleet.

Note: Port locations mapped for illustration only, map may not reflect locations precisely  
Source: Seafish analysis

## Map of sea areas

Figure 20. Map of FAO sea areas surrounding the UK



FAO sea areas surrounding EAE

Subarea IV – North Sea

Division IV b – Central North Sea

Division IV c – Southern North Sea

Division VII d – Eastern English Channel

# • Analysis by topic

- Health of the stocks
- Economic Link
- Brexit, including tariffs and zonal attachment

7

# Condition and management systems of key stocks in East Anglia and Essex

Table 5. Management systems and stock condition of key stocks

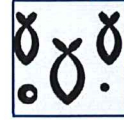
| Species          | RAG status               | UK Revenues, IVc 2016 | Management systems                                                                                                                      | Sources                                                                            |
|------------------|--------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Cockles          | No MSYBtrigger estimate  | £3.5 M                | Regulation and TAC vary annually based on biomass estimates                                                                             | EIFCA cockles management plan 2017                                                 |
| Whelks           | No MSYBtrigger estimate* | £3.3 M                | Permit mechanism; effort, gear and minimum landing size controls                                                                        | EIFCA strategic assessment 2018 and Impact assessment for EIFCA Whelks byelaw 2015 |
| Common Sole      | Green                    | £2.9 M                | EU TAC, demersal landing obligation                                                                                                     | ICES assessment for Sole in subarea 4.                                             |
| Brown Shrimps    | Green**                  | £2.7 M                | Protected areas byelaw, vessel size and gear restrictions                                                                               | EIFCA strategic assessment 2018, Wash Brown Shrimp Plan, Acoura Marine report      |
| European Lobster | Red                      | £1.2 M                | National min. landing size, effort control (for >15m), national prohibition on landing ovigerous females                                | CEFAS stock status report 2017                                                     |
| Crabs            | Amber                    | £0.6 M                | National minimum landings size (regional dispensation), regional prohibition on landing ovigerous females and crabs right after a moult | CEFAS stock status report 2017                                                     |
| Cod              | Red                      | £0.3 M                | EU TAC, demersal landing obligation                                                                                                     | ICES assessment for Cod in Subarea 4, Division 7d and Subdivision 20               |

**Red:** Biomass below MSYBtrigger    **Amber:** Slightly below MSYBtrigger    **Green:** Biomass above MSYBtrigger

\*Ongoing research project by EIFCA on effort restrictions in context of MSY \*\* Management to MSYBtrigger not appropriate as the species has a short life and high production to biomass ratio, management based on CPUE, which according to recent assessment is above the threshold

Note: MSYB trigger is a parameter in the ICES max. sustainable yield (MSY) framework, triggering advice on reduced fishing mortality (below FMSY). [vivid economics](#)

## Key decisions that define the state of the world for East Anglian fisheries include Brexit negotiations, the Economic Link and the status of the under 10m pool

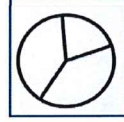


### Stock management

#### Decision

- Current Stock management vs mixed fisheries approach. Quota versus effort based
- Health of the stocks, **maximum sustainable yield**, optimal flexibility for fishers

#### Implications



### Brexit negotiations

- Zonal attachment or relative stability; no **tariffs**, EU-EEA tariffs or MFN tariffs; non tariff measures
- **Increased quota** for the UK fleet under ZA; **reduced** fleet and processing **margins** with tariffs



### Economic link

- Current Economic Link vs tightening of EL (quota donation, landing requirement, levy on foregone landings)
- **Increased landings** in the UK by foreign owned offshore fleet; quota donation leads to higher landings by the inshore fleet; additional tax revenue with levy



### u10m Pool

- Enhanced pool, no pool, or 'partnership' of limited number of new inshore [12nm] licences
- **Larger pool share of quota** and enhanced management of quota distribution (**improved quota uptake**) under *enhanced pool*
- u10m vessels become part of sector under *no pool*, also leading to **higher quota utilisation**

## Under full Zonal Attachment, multiples of current quota stock catch will be available to the UK registered fleet

In a scenario where the UK leaves the Common Fisheries Policy, all stocks within the UK's Exclusive Economic Zone (EEZ) will become available for catch by UK registered vessels.

Table 6. Potential increase in landings of the UK fleet by species under Zonal Attachment compared to 2016

|                                                | SOLE         | PLAICE       | HERRING     | ALL QUOTA     | ALL NON-QUOTA |
|------------------------------------------------|--------------|--------------|-------------|---------------|---------------|
| UK fleet catch in IVc, 2016                    | 390 tonnes   | 330 tonnes   | 190 tonnes  | 1,900 tonnes  | 10,200 tonnes |
| Potential UK fleet catch with Zonal attachment | 3,000 tonnes | 3,700 tonnes | 2000 tonnes | 12,600 tonnes | 12,800 tonnes |
| Relative increase                              | 8 times      | 11 times     | 10 times    | 7 times       | 1,3 times     |

This analysis is based on 2016 values of live weight landed from sea area 27.4.c by statistical rectangle, as reported by EU member states to STECF. Results of this estimation approach may vary by year. The dataset informing this analysis is not available for the years 2017 or 2018.

## Estimation method: UK EEZ landings by species (Potential landings under Zonal Attachment)

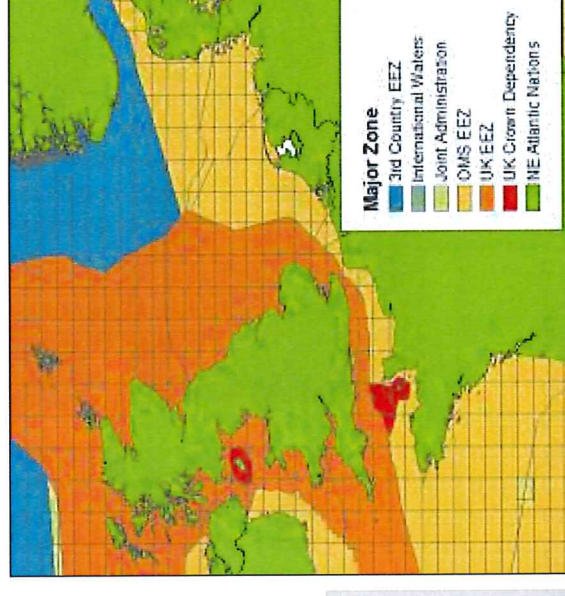
In order to assess the potential landings volumes of UK vessels in a scenario where the UK leaves the Common Fisheries Policy, this analysis separates the commercial sea fisheries landings in sea area 27.4.c by the nationality of the waters in which the fish were caught. This methodology follows K. Williamson et al., 2017.

1. STECF 2016 provides landings of EU vessels by stock by statistical rectangle
2. ICES statistical rectangle factors are applied to identify the percentage share (area) of every rectangle that lies within the UK EEZ
3. Stocks are assumed to be evenly distributed within each rectangle
4. Total catch by species within UK's EEZ can be determined, for example for all ICES statistical rectangles within the Southern North Sea (27.4.c)
5. Total catch by species within UK's EEZ is compared to actual UK fleet catch by species within the sea area

### Limitations of this approach include

- This analysis is a snapshot of only one year. Stocks may be distributed significantly different in the following year.
- Stocks may not be distributed evenly across statistical rectangles.
- Reporting differences between current UK catch and UK EEZ potential for only one sea area does not account for potentially opposite balances in other sea areas.

Figure 21. ICES statistical rectangles and Exclusive Economic Zones



## Under Zonal attachment, the fleet to be accommodated in Southern North Sea ports would include up to 32 offshore vessels

Table 7. Estimating additional vessel landings by vessel group

|                                                                             | Offshore<br>fleet | Inshore/<br>community fleet | Shellfish fleet | Low activity<br>fleet | Total |
|-----------------------------------------------------------------------------|-------------------|-----------------------------|-----------------|-----------------------|-------|
| Current<br>UK fleet in 27.4.c (2017)<br>(>30% 4c)                           | 3                 | 43                          | 119             | 179                   | 344   |
| With strongest Economic<br>Link and Zonal attachment<br>(number of vessels) | 34                | 40                          | 119             | <179                  | <371  |

**Offshore fleet**  
ZA will add significantly to the offshore fleet. A stronger Economic link could require the additional offshore vessels catching in IVc to land in the UK.

**Shellfish fleet**  
The Shellfish fleet is independent of EL regulation and ZA, but may be willing to take up quota.

**Inshore fleet**  
ZA will, if distributed to the inshore fleet proportionally, increase utilisation and employment of all vessels significantly.

**Low activity fleet**  
Fleet size of the low activity fleet is independent of EL and ZA. However, vessels are expected to move to the active inshore fleet in response to greater quota stock availability.

Source: Vivid analysis based on MIMO 2017 and Seafish

## Estimation method: Potential future fleet under Zonal Attachment

In order to translate the potential landings volumes of UK vessels in a scenario where the UK leaves the Common Fisheries

Policy potential fleet size and characteristics, a number of assumptions are required.

The following assumptions were selected, informing analysis on potential characteristics of the future fleet:

1. Additional landings that become available under Zonal Attachment are distributed between non-shellfish inshore and offshore vessels. The shellfish fleet and the low activity fleet are assumed to continue to catch at current levels.
2. Additional landings are split between the non-shellfish inshore and offshore fleets so that relative size of the fleets stays at current levels. This requires an inshore fleet that is capable of catching stocks up to 20nm offshore.
3. It is assumed that the inshore fleet gradually moves to highly active vessels of about 14 meters length. The estimation assumes a representative vessel with an annual income of £250,000, landing about 110 tonnes annually and employing a crew of 3.
4. It is assumed that the offshore fleet consists of highly active vessels, small enough to be able to land into regional ports. The estimation assumes a representative vessel with a length of 20-22 meters, an annual income of £800,000, landing 340 tonnes and employing a crew of 5.

Source: Vivid Economics modelling based on insights collected in conversations with stakeholders and experts

## Landings into EAE can increase five times, total jobs can double and jobs in the inshore fleet can increase six-fold in the best case scenario by 2030

Table 8. Scenario analysis for jobs, landings and vessel numbers

| Scenario                                                                                                                                                                        | Jobs (FTE, EAE landing fleets (>50%) and processing) | Value of EAE landings total (£m)     | Number of active vessels (>50% EAE landing) | Processing sector | Shellfish Fleet | Offshore Fleet | Inshore Fleet |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------|---------------------------------------------|-------------------|-----------------|----------------|---------------|
| <b>Baseline: 2016</b>                                                                                                                                                           | 328<br>14 0 17<br>88 209                             | 9.6<br>0.8 0.8 8                     | 100<br>24 0 76                              |                   |                 |                |               |
| <b>Best case 2030</b><br>Full Zonal Attachment, strongest Economic Link landings requirement, efficient fleet, prices adjust to UK averages                                     | 660<br>(+100%)<br>118 17 355<br>88 88                | 39.3<br>(+310%)<br>0.8 8 8.2<br>22.3 | 130<br>(+30%)<br>24 28 76                   |                   |                 |                |               |
| <b>Mid case 2030</b><br>Full Zonal Attachment, current Economic Link landings requirement, efficient fleet, no price adjustment                                                 | 490<br>(+50%)<br>50 10 267<br>66 88                  | 22.9<br>(+140%)<br>0.8 8 5.7<br>8.4  | 110<br>(+10%)<br>10 22 76                   |                   |                 |                |               |
| <b>Worst case/BAU 2030</b><br>No action across quota allocation, EL, vessel utilisation or prices, no tariffs, closure of 15% of processing plants, exit 15% of inshore vessels | 290<br>(-10%)<br>12 0 17<br>88 178                   | 9.4<br>(0%)<br>0.8 0.8 8             | 95<br>(-5%)<br>20 0 76                      |                   |                 |                |               |

Source: Vivid Economic modelling based on MMO 2016, Seafish fleet economic performance 2016

## Estimation detail: Scenario analysis

3 scenarios are analysed to compare potential future states of the world in terms of landings, jobs and vessel numbers.

Table 9. Assumptions informing the scenario analysis

| Scenario            | Assumptions                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Best case 2030      | <ul style="list-style-type: none"><li>• Zonal Attachment</li><li>• strongest Economic Link landings requirement: all UK registered vessels land into UK ports</li><li>• efficient fleet, as defined on slide 41</li><li>• prices adjust to UK averages</li><li>• EAE ports receive 70% of landings by UK inshore and offshore vessels from sea area 27.4.c (value share)</li></ul>                                    |
| Mid case 2030       | <ul style="list-style-type: none"><li>• Zonal Attachment</li><li>• no change to current Economic Link regulation</li><li>• efficient fleet, as defined on slide 41</li><li>• no price adjustment</li><li>• EAE ports receive 30% of landings by UK offshore vessels from sea area 27.4.c (value share)</li><li>• EAE ports receive 55% of landings by UK inshore vessels from sea area 27.4.c (value share)</li></ul> |
| Worst case/BAU 2030 | <ul style="list-style-type: none"><li>• No action across quota allocation, Economic Link, vessel utilisation or prices</li><li>• Market exit of 15% of processing plants</li><li>• Exit of 15% of inshore vessels</li><li>• EAE ports value share of landings by UK vessels from sea area 27.4.c is unchanged from today</li></ul>                                                                                    |

Source: Vivid Economics modelling

**Table 10. Detail on opportunity with Zonal attachment and strengthened Economic Link**

|                                              | Current         |               | Opportunity (Best case: ZA and strategy recommendations) |             |
|----------------------------------------------|-----------------|---------------|----------------------------------------------------------|-------------|
|                                              | in/into UK      | in/into EAE** | in/into UK                                               | in/into EAE |
| Tonnes/yr landed (by UK vessels from IVc)    | Inshore fleet   | 600           | 200                                                      | 4,200       |
|                                              | Shellfish fleet | 9,700         | 7,000                                                    | 9,700       |
|                                              | Offshore fleet* | 200           | 0                                                        | 11,300      |
|                                              | Total           | 10,700        | 7,600                                                    | 25,400      |
| Value/yr landed (by UK vessels from IVc) *** | Inshore fleet   | £1.7m         | £0.8m                                                    | £11.7m      |
|                                              | Shellfish fleet | £11m          | £8m                                                      | £11m        |
|                                              | Offshore fleet* | £0.3m         | £0m                                                      | £32m        |
|                                              | Total           | £14m          | £9.6m                                                    | £55m        |
| Jobs                                         | Inshore fleet   | 39            | 14                                                       | 119         |
|                                              | Shellfish fleet | 150           | 73                                                       | 150         |
|                                              | Offshore fleet  | 3             | 0                                                        | 168         |
|                                              | Processing      | -             | 209                                                      | +146        |
|                                              | Total           | -             | 328                                                      | up to 360   |
| GVA/yr                                       | Inshore fleet   | £0.9m         | £0.4m                                                    | >£7.7m      |
|                                              | Shellfish fleet | £5.5m         | £3.4m                                                    | >£5.4m      |
|                                              | Offshore fleet* | -             | -                                                        | £5.5m       |
|                                              | Processing****  | -             | £11m                                                     | >£21m       |
|                                              | Total           | -             | £15m                                                     | >£14.7m     |
| Vessel numbers                               | Inshore fleet   | 42            | 24                                                       | £11 - 19m   |
|                                              | Shellfish fleet | 113           | 76                                                       | £24 - 43m   |
|                                              | Offshore fleet  | 2             | 0                                                        | 40          |
|                                              | Total           | 157           | 100                                                      | 113         |
|                                              |                 |               |                                                          | 80          |
| Fishing GVA/fisher                           | Inshore fleet   | 23,327        | 29,040                                                   | 34          |
|                                              | Shellfish fleet | 36,539        | 38,184                                                   | 187         |
|                                              | Offshore fleet  | 759,661       |                                                          | 130         |
|                                              |                 |               |                                                          | 68,000      |
|                                              |                 |               |                                                          | 37,000      |
|                                              |                 |               |                                                          | 123,000     |

## Tariffs vary by species

Identifying exposure to tariff and non-tariff measures by fleet group (catching sectors) and for other actors in the supply chain is not possible, as no regional data is available on exports by species. Landings may be exported after the first point of sale.

- No estimates are available for shares of regional species landings exported into the EU
- Export may happen after primary point of sale, but tariffs will likely be passed through to catching sector
- In addition to tariff measures, Brexit is expected to create non-tariff barriers for trade, which are similarly imposing cost on the local industry

Table 11. Indicative tariffs for selected species

| Product              | EU average MFN Tariff 2017 (%) | Preferential Tariff (Tariff for EEA) (%) |
|----------------------|--------------------------------|------------------------------------------|
| Sole (frozen)        | 7.5                            | 2.2                                      |
| Plaice (frozen)      | 15                             | 4.5                                      |
| Cod (frozen)         | 11.5                           | 0                                        |
| Herring (frozen)     | 15                             | 4.5                                      |
| Brown Shrimps        | 12                             | 0                                        |
| Lobsters (in pieces) | 16                             | 4.5                                      |
| Crabs                | 7.5                            | 2.2                                      |
| Oyster               | 9                              | 2.7                                      |

Notes: Fish type indicated in brackets, multiple types exist by species and tariffs vary significantly  
Source: gov.uk Trade-Tariff service

## The Economic Link regulation does not appropriately define how quota donations should be valued

- The Economic Link requires every vessel fishing UK quota-controlled stocks to comply with one out of a set of conditions
- The EL regulations have the greatest impact on foreign-owned UK registered vessels
- Donating quota to the pool is an attractive option for compliance, as quota donations can be valued based on stock market prices
- Low quota uptake rates in the under 10m pool indicate that quota in the pool can not always be utilised
- Stakeholder interviews suggest that this fact is linked to over-valued quota donations of unavailable quota stocks

Table 12. Quota uptake of Under 10 in England by stock, 2018

| Stock                     | Landings % of quota |
|---------------------------|---------------------|
| North Sea Cod             | 99.6                |
| North Sea Plaice          | 9.5                 |
| North Sea Common Sole     | 38.4                |
| North Sea Skates and Rays | 81.7                |
| North Sea Haddock         | 54.5                |
| North Sea Whiting         | 15.8                |
| North Sea Saithe          | 67.5                |

Source: Fisheries quota management monitor of North Sea and West Of Scotland for 2018

## Abbreviations and terminology

|                |                                                           |                     |                                                                                                                               |
|----------------|-----------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 27.4.c (IV.c.) | FAO fisheries management area, subarea and division       | Non-quota stocks    | Stocks that are not currently managed by a quota under the Common Fisheries Policy                                            |
| CEFAS          | Centre for Environment, Fisheries and Aquaculture Science | Non-tariff measures | Policy measures other than tariffs, that can affect international trade flows, such as restrictions and technical regulations |
| DAS, kW DAS    | Days at sea, kilowatt days at sea                         | Quota stocks        | Stocks currently managed by a quota under the Common Fisheries Policy                                                         |
| EAE            | East Anglia and Essex (NUTS 2 definitions)                | RoW                 | Rest of world                                                                                                                 |
| FAO            | Food and Agriculture Organisation                         | SSB MSY             | Spawning Stock Biomass corresponding to the level that results in Maximum Sustainable Yield over time                         |
| FTE            | Full-time equivalent, measure for employment              | STECF               | Scientific, Technical and Economic Committee for Fisheries                                                                    |
| GVA            | Gross value added, combined measure of profits and wages  | TAC                 | Total allowable catch                                                                                                         |
| ICES           | International Council for the Exploration of the Sea      | Tariff measures     | Policy measures introducing tariffs on traded goods                                                                           |
| MFN            | Most favoured nation, principle in international trade    | UK EEZ              | United Kingdom's Exclusive economic zone, sea zone with special exploration rights as prescribed by the UN                    |
| MMO            | Marine Management Organisation                            |                     |                                                                                                                               |

## Data sources and references

|    |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | CEFAS Register for Aquaculture Production Businesses in England and Wales                                                                                                                  | <a href="https://www.cefas.co.uk/eu-register/annex-ii/">https://www.cefas.co.uk/eu-register/annex-ii/</a>                                                                                                                                                                                                                                                                                                                             |
| 2  | DEFRA (2012) Sea Angling 2012- A survey of recreational sea angling activity and economic value in England                                                                                 | <a href="http://randd.defra.gov.uk/Document.aspx?Document=12025_SeaAngling2012synthesisreportFINAL.pdf">http://randd.defra.gov.uk/Document.aspx?Document=12025_SeaAngling2012synthesisreportFINAL.pdf</a>                                                                                                                                                                                                                             |
| 3  | EU Scientific, Technical and Economic Committee for Fisheries (STECF) 2016 Aquaculture sector data call                                                                                    | <a href="https://stecf.irc.ec.europa.eu/dd/aqua">https://stecf.irc.ec.europa.eu/dd/aqua</a>                                                                                                                                                                                                                                                                                                                                           |
| 4  | ICES Historical Nominal Catches 1950-2010 in FAO area 27 by country, species, area and year                                                                                                | <a href="https://www.ices.dk/marine-data/dataset-collections/Pages/Fish-catch-and-stock-assessment.aspx">https://www.ices.dk/marine-data/dataset-collections/Pages/Fish-catch-and-stock-assessment.aspx</a>                                                                                                                                                                                                                           |
| 5  | ICES Statistical Rectangles (StatRecs)                                                                                                                                                     | <a href="https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/743336/ICES_Statistical_Rectangle_Factors.xlsx">https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/743336/ICES_Statistical_Rectangle_Factors.xlsx</a>                                                                                                                           |
| 6  | K. Williamson et al. (2017), United Kingdom commercial sea fisheries landings by Exclusive Economic Zone of capture: 2012 – 2016. MMO                                                      | <a href="https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/647579/United_Kingdom_commercial_sea_fisheries_landings_by_Exclusive_Economic_Zone_of_capture_2012_2016.pdf">https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/647579/United_Kingdom_commercial_sea_fisheries_landings_by_Exclusive_Economic_Zone_of_capture_2012_2016.pdf</a> |
| 7  | Marine Scotland (2018), Seafood Trade Modelling Research Project - Assessing the Impact of Alternative Fish Trade Agreements Post EU-Exit                                                  | <a href="https://www.gov.scot/publications/economic-impacts-scenarios-scottish-uk-seafood-industries-post-eu-exit/">https://www.gov.scot/publications/economic-impacts-scenarios-scottish-uk-seafood-industries-post-eu-exit/</a>                                                                                                                                                                                                     |
| 8  | MMO 2016, MMO 2017, MMO 2018 Sea fisheries annual statistics. Aggregate statistics available via link on the right. Disaggregated, anonymised data was supplied to the authors on request. | <a href="https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics">https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics</a>                                                                                                                                                                                                                                                               |
| 9  | Seafish (2016), Aquaculture in England, Wales and Northern Ireland.                                                                                                                        | <a href="https://www.seafish.org/media/publications/FINALISED_Aquaculture_in_EWNI_FINALISED_-_Sept_2016.pdf">https://www.seafish.org/media/publications/FINALISED_Aquaculture_in_EWNI_FINALISED_-_Sept_2016.pdf</a>                                                                                                                                                                                                                   |
| 10 | Seafish Fleet Economic Performance 2013-2017                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 11 | Seafish Processing Financial survey 2008-2015                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 12 | Seafish Processing Sector Census 2008-2018                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 13 | STECF EU Fleet Economic Performance, 2018 data call                                                                                                                                        | <a href="https://stecf.irc.ec.europa.eu/dd/fleet">https://stecf.irc.ec.europa.eu/dd/fleet</a>                                                                                                                                                                                                                                                                                                                                         |
| 14 | MMO 2018 Quota use statistics: Fisheries quota management monitor of North Sea and West Of Scotland for 2018                                                                               | <a href="https://www.gov.uk/government/statistical-data-sets/quota-use-statistics">https://www.gov.uk/government/statistical-data-sets/quota-use-statistics</a>                                                                                                                                                                                                                                                                       |
| 15 | gov.uk Trade-Tariff service                                                                                                                                                                | <a href="https://www.gov.uk/trade-tariff">https://www.gov.uk/trade-tariff</a>                                                                                                                                                                                                                                                                                                                                                         |

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