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Landing Obligation Economic Impact Assessment (EIA)

Final Interim Report One: Choke Analysis

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Interim Report One: Choke Analysis

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1. INTRODUCTION

1.1. PURPOSE OF THE LANDING OBLIGATION ECONOMIC IMPACT ASSESSMENT

Seafish is undertaking an economic impact assessment of the landing obligation. The landing obligation has been introduced as part of the reform of the Common Fisheries Policy (CFP) and requires all catch that is subject to catch limits or quotas to be landed. The purpose of the economic impact assessment is to provide information on demersal fleet segments (including nephrops) that will support decision-making and understanding at a fleet segment, home nation and UK national level.

1.2. PURPOSE OF INTERIM REPORT ONE: CHOKE ANALYSIS

The Landing Obligation Economic Impact Assessment project is being undertaken in three analytical phases. Interim Report One reports on the first phase of the project, the choke analysis. Interim Report Two will present the findings from bioeconomic modelling of the potential effect of the landing obligation and the relative impact of possible scenarios for implementing the landing obligation. The third phase of the project will consider the potential economic impacts of the landing obligation onshore and the findings from the third phase will be included in the final report. The choke analysis is an essential analysis which creates a baseline upon which the analyses in phases two and three can build.

The main purpose of the choke analysis is to understand, if the landing obligation had been implemented in 2013, what impact the landing obligation might have caused on the activity of different fleet segments. The choke analysis is a retrospective analysis using data from 2013. The choke analysis is not a prediction of what we think will happen.

To understand what impact the landing obligation could have had if applied in 2013 the choke analysis does the following:

- identifies choke species that could have had an impact on the activity of a home nation fleet segment. Choke species are those species for which initial quota allocation would have been used up in fewer days than the fleet actually fished in 2013;
- identifies the primary choke species for a home nation fleet segment, i.e. the species that would be first to create a choke;
- calculates how many days of fishing it would take until the primary choke species might affect the activity of a home nation fleet segment;
- illustrates the possible effects of mechanisms designed to alleviate the choke situation under the landing obligation. The choke analysis considers the potential benefit of transitional rules (from 2016), quota uplift and interspecies flexibility. The extent to which quota uplift and interspecies flexibility might have been available in 2013 is based on ICES advice from 2012. Descriptions of these mechanisms are included in Chapter 2.

1.3. KEY ISSUES FOR THE CHOKE ANALYSIS

A number of challenges were faced in the development of a choke analysis for the landing obligation. These include, among others: uncertainty over the implementation and operation of the landing obligation; limited evidence on discarding and therefore actual catch volumes; the existence of quota species for which no quota is allocated to POs; and, a dependency on trading and swaps to support catching activity.

An approach was developed for the choke analysis which presents the most robust findings available. Chapter 3 explains the approach and assumptions in more detail but it is particularly important to note the following.

- A choke analysis is provided for six fleet segments. The fleet segments are classified by home nation and as either a whitefish trawl/seine fleet, a nephrops trawl fleet or a beam trawl fleet. Due to time and data restrictions, the fleet segments do not include under 10m vessels.
- The choke analysis is based on the initial quota allocation to a fleet segment. The catch rate used to calculate how quickly the initial quota allocation for a species could be caught is based on estimated catch (actual landings + estimated discards) and actual days at sea.
- The choke analysis does not consider the impact of potential derogations and exemptions that may occur under de minimis and survivability clauses in the landing obligation. Furthermore, the choke analysis does not quantify the potential impact of interspecies flexibility. The potential impact of derogations and exemptions will be considered and compared in phase two, the bioeconomic analysis.
- As a retrospective analysis, the choke analysis does not consider how the landing obligation might lead to fishermen altering their fishing operations to avoid choke species or how the market for swapping and leasing quota might change under a landing obligation.
- The discard rates applied have been calculated from information provided by Marine Scotland (including data from Scottish Fishermen's Federation) and Cefas. Discard rates have been calculated from the raw data for 2013 for each type of fleet segment defined in the choke analysis i.e. whitefish trawl/seine, nephrops trawl and beam trawl. The calculation of discard rates by fleet segment, rather than by TR1 and TR2, means that the discard rates used in the choke analysis may not match other published discard rates, however they have been calculated in this manner to provide the best information for the choke analysis.

1.4. STRUCTURE OF REPORT

Interim Report One is structured as follows:

- Chapter 2 provides context for the choke analysis and includes further information on the landing obligation and an overview of the fleet segments covered by the choke analysis;
- Chapter 3 sets out the approach to the choke analysis and provides information on key assumptions and the methodology adopted to undertake the choke analysis;
- Chapters 4-9 are designed so that they can be read in isolation. The chapters present the findings from the choke analyses for:
    - England whitefish trawl/seine fleet segment (Chapter 4);
    - England nephrops trawl fleet segment (Chapter 5);
    - England beam trawl fleet segment (Chapter 6);
    - Northern Ireland nephrops trawl fleet segment (Chapter 7);
    - Scotland whitefish trawl/seine fleet segment (Chapter 8); and
    - Scotland nephrops trawl fleet segment (Chapter 9).
- Chapter 10 considers to what degree quota existed in the UK in 2013 for key choke species in different fleet segments;
- Chapter 11 presents the views of producer organisation (PO) representatives on individual choke analyses that were produced for fleet segments within each PO, and the views of the representatives on the potential to mitigate the impact of the landing obligation. The interviews were undertaken in November and December 2014 and therefore reflect views from that time;
- Chapter 12 provides a summary of the choke analyses presented.

- Appendix A contains descriptions of calculations and assumptions used in the choke analysis including information on how discard rates have been calculated and how quota on dummy licenses has been allocated.
- Appendix B, which is a separate spreadsheet file, contains the detailed findings of the home nation choke analyses for each fleet segment. Further information on initial quota allocation, landings, discard rates and choke species can be found within it.

2. CONTEXT

Chapter 2 provides context for the choke analysis by describing the landing obligation and presenting an overview of the UK demersal fleet included in the choke analysis. For the purpose of the landing obligation regulation and therefore the Landing Obligation Economic Impact Assessment the demersal fleet includes nephrops vessels.

2.1. THE LANDING OBLIGATION

Article 15 of the reformed Common Fisheries Policy (EC Reg. 1380/2013) introduces a regulatory requirement for the EU fishing fleet to land all catches subject to catch limits or quotas (the landing obligation).

The landing obligation was implemented for EU pelagic fisheries from January 2015. For demersal fisheries, the landing obligation will come into force on 1 January 2016. However, full implementation will not occur until 1 January 2019. Transitional rules which propose a phased approach are expected to be in place for the period from 1 January 2016 to 31 December 2018.

The landing obligation proposes that fleet segments targeting certain demersal species with TACs (Table 2-1) will be subject to the policy in 2016 and remaining demersal TAC species will be subject to the policy in 2019. Accordingly 2016 and 2019 are two key points in the choke analysis and future phases of the Landing Obligation Economic Impact Assessment.

	North Sea	North Western waters	South Western waters
Fisheries for…	Norway lobster (*Nephrops*)	Norway lobster (*Nephrops*)	Norway lobster (*Nephrops*)
Fisheries for…	common sole and plaice	common sole and plaice	common sole and plaice
Fisheries for…	hake	hake	hake
Fisheries for…	cod, haddock, whiting, saithe	cod, haddock, whiting, saithe	
Fisheries for…	Northern prawn		

Table 2-1: List of species that define the fishery, by area proposed in the landing obligation for introduction under transitional rules in 2016

The fisheries which are included in the choke analysis are fisheries for:

- nephrops;
- common sole and plaice; and
- cod, haddock, whiting and saithe.

It is assumed in the choke analysis that the landing obligation for these fisheries will be implemented as proposed.

Introduction of the landing obligation will require changes to regulations and definitions to avoid contradictions with current regulations. These are to be addressed in an 'Omnibus regulation'. Introduction of the landing obligation will require changes to regulations and definitions of to avoid contradictions with current regulations. This will be addressed in the overhaul of Technical Conservation regulation and the Cod Recovery Plan. Certain key elements of the landing obligation and how it will be delivered are still to be confirmed.

Article 15 does propose a number of exemptions to the obligation to land; e.g. species with high survival can be returned to the sea. A 'de minimis' exemption of 5% can be applied where increased selectivity is very difficult or catch handling results in disproportionate additional costs.

There is an expectation that under the landing obligation, the total allowable catch for a number of stocks will be subject to an 'uplift' as the estimated volume of fish previously discarded can be included in what would become a catch quota rather than the current landing quota. This additional allowance in respect of previously discarded fish is termed 'quota uplift'.

There is allowance in Article 15 for year-to-year flexibility to "bank" or "borrow" up to 10% of annual quota. There is also a provision to enable the counting of unwanted catch against up to 9% of target species quota, where the non-target stock is within 'safe biological limits'; this is termed 'interspecies flexibility'.

Details of how the above flexibilities will be applied in practice are still to be determined. Regional groups are discussing how best to implement these flexibilities.

Due to the remaining uncertainties about how the landing obligation will be applied and how vessels will be operated under the landing obligation, this choke analysis has to be based on several assumptions. The main assumptions are discussed in Chapter 3 with further detail provided in Appendix A.

2.2. THE HOME NATION FLEET SEGMENTS

The UK demersal fleet is frequently described using TR1 and TR2 categories. TR1 and TR2 refer to the type of gear on board a vessel. These definitions are not used in the choke analysis because the landing obligation (Article 15) defines vessels, and therefore fleet segments, by the species targeted, not the gear type used. It is understood that a minority of vessels may principally target species not traditionally associated with their TR1 or TR2 status. Therefore each over 10m demersal vessel in the UK (including non-sector vessels) has been allocated to one of the following segments based on the registered nation of the vessel and species contributing the majority of value landed. The fishery of each vessel was defined using the categories stated in the landing obligation which means a vessel was allocated either to a fishery targeting cod, haddock, whiting and saithe, a fishery targeting nephrops or a fishery targeting common sole and plaice.

The six home nation fleet segments, as defined for the choke analysis, are:

- England whitefish trawl/seine;
- Scotland whitefish trawl/seine;
- England nephrops trawl;
- Northern Ireland nephrops trawl;
- Scotland nephrops trawl; and
- England beam trawl.

There were some over 10m demersal vessels that were not included in the fleet segments above, this is because they represented a small fleet segment including Northern Ireland whitefish trawl/seine and Wales whitefish trawl/seine. However, these vessels will still be affected by the landing obligation, as will the under 10m vessels.

A minority of vessels switch between fisheries during the year and therefore at different times of the year could be considered either a nephrops vessel or a whitefish vessel. For the purpose of the choke analysis, and the rest of the Landing Obligation Economic Impact Assessment, these vessels have been allocated to one segment only. The allocation was undertaken on the basis of which species contributed the majority of landed value.

The activity of all six fleet segments in 2013 is shown in Table 2-2.

The landings listed in the table below are landings of demersal quota species only. The fleet segments may also land non-quota demersal or other species and pelagic species.

Home Nation and Fleet Segment	Total Number of Vessels in 2013	Actual landings of demersal quota species landings in 2013 (tonnes)	Actual Days at Sea in 2013	% of total days spent in each area by each fleet segment		
				Area IV North Sea	Area VI West of Scotland	Area VII
England whitefish trawl/seine	93	21,741	15,316	23	0	77
Scotland whitefish trawl/seine	121	76,293	21,155	79	15	5
England nephrops trawl	35	1,520	3,884	72	13	15
Northern Ireland nephrops trawl	99	8,574	13,764	6	17	77
Scotland nephrops trawl	208	21,423	33,457	37	61	2
England beam trawl	70	15,057	14,387	30	0	70
Total	626	144,608	101,963	-	-	-

Table 2-2: Size and activity of the home nation fleet segments included in the choke analysis, 2013

3. APPROACH TO THE CHOKE ANALYSIS

3.1. OVERVIEW

The definition of a choke species for this analysis is:

A species for which a fleet segment had insufficient initial quota allocation in 2013 to enable it to land its total catch of the species in 2013.

Recently, and in simple terms, catch in excess of initial quota allocation has been addressed by a fleet segment in one of two ways:

- by discarding the excess catch; and/or
- by leasing or swapping in quota for the excess catch.

The landing obligation removes the option of discarding excess catch, although some derogations may become available. The landing obligation also removes the option of discarding unwanted catch, for example undersize fish or species for which a vessel owner may believe there is no market.

To help understand the potential impact of the landing obligation, the choke analysis presented in Interim Report One considers how many days the initial quota allocation for each demersal quota species would have enabled a fleet segment to fish in 2013. The analysis assumes that total catch (landings + estimated discards in 2013) would have been landed and counted against the initial quota allocation to the home nation fleet segment because the landing obligation would have removed the option of discarding excess or unwanted catch.

The analysis also assumes that the second option of addressing catch in excess of initial quota allocation, leasing and swapping in additional quota, other than from the dummy licence in a vessel's PO, is not available. This assumption has been made in the choke analysis because it is not considered possible to reasonably predict how trading patterns for quota are likely to be affected by the landing obligation. There is an expectation that quota trading will be affected because of uncertainty, meaning quota managers may retain quota that they previously would have traded, potentially to cover unwanted catch that was previously discarded. In reality there is expected to be an active quota trading market, however, it is considered unlikely by the authors and by consulted POs that under the landing obligation that trading patterns will continue as they have been in the past.

The choke analysis uses an average catch rate per day at sea for each fleet segment, species and sea area. It is recognised that there is much variation around the average catch rate per species on a vessel by vessel basis but nevertheless use of averages at a fleet segment level is essential in the choke analysis and provides the best representation of likely impact available at a home nation level.

From the calculations described above a primary choke species for each home nation fleet segment is identified for each sea area the segment operated in during 2013. The **primary choke species** is the species for which the initial quota allocation to a fleet segment would have been caught in the fewest number of days i.e. before the initial quota allocation for any other species is fully caught.

A full choke analysis for each home nation fleet segment was also undertaken for 2011 and 2012 and how the primary choke species compares between the three years is described.

A choke analysis is presented for each fleet segment by home nation. Due to use of averages in calculations, it is likely that the primary choke species for an individual vessel or individual producer organisation may vary from the national picture presented in this choke analysis.

The choke analysis has excluded 'zero quota species'. These are species for which no quota is allocated to POs, although in some cases there is a small allocation of quota to the UK. However, the fleet

segments analysed may have had landings for these species in 2013. In theory such stocks could 'choke' a vessel or fleet segment capable of catching that stock and stop it from fishing in the sea area affected at a very early stage, if at all. It is not considered likely that this will be the outcome and therefore it is assumed that solutions will be found to prevent very early choke caused by these stocks.

3.2. CHALLENGES

There are several challenges in producing a choke analysis for the UK fleet as data are limited and the discarding rates of vessels is dependent on circumstance, including individual quota holdings, fishing location, season and market conditions. The overall approach has been to focus on the over 10m fleet using the best available data in the most appropriate way, clearly recognising the data limitations and assumptions being made. Important aspects to recognise are:

- Catch composition is informed by landings volume plus observed discard volumes produced by Cefas and Marine Scotland. Therefore total catch is an estimate created from landings data, which is robust, plus discard volume estimates, for which there is limited evidence.
- Stocks for which no quota is allocated to POs could be assumed to effectively close a fishing area on day one to all vessels that have the potential to catch that stock.
- Future TACs, catch and quota trading cannot be predicted with any certainty, particularly under a yet-to-be-implemented and fully-defined landing obligation.
- The policy levers that might be implemented under the landing obligation and which could affect choke species are not yet defined.

3.3. METHODOLOGY

The research and analysis undertaken to support production of Interim Report One included:

- Fleet segmentation and status quo analysis;
- Choke analyses by nation and fleet segment;
- Choke analyses by PO and fleet segment; and
- Consultations with fisheries administrations and POs.

A substantial amount of data were collected for the analysis and critical data to the choke analyses were sourced as follows:

- Vessel data identifying gear type, PO membership and nationality were provided by MMO.
- Landings by vessel with PO and gear type identified were provided by MMO.
- Discard data by vessel and trip, as recorded in observer programmes, were provided by Marine Scotland Science and CEFAS.
- Days at sea by vessel with PO and gear type identified were provided by MMO.
- FQA holdings by vessel, dummy licence and entitlement were provided by MMO.
- Initial quota allocations in tonnes for 2013 were also provided by MMO.

These data all fed into the choke analyses.

The Phase One choke analysis has been undertaken at two levels. The first is a PO level analysis where a choke analysis is applied to key fleet segments for each PO and these were used as the basis for discussions with POs. The second level is at a home nation level where a choke analysis is applied to fleet segments for each home nation, essentially grouping, for instance, all Scottish whitefish vessels, as if they

were in one PO, able to trade whitefish quota among themselves. For confidentiality reasons, only the national level analysis is presented in this report.

Figure 3-1 demonstrates how data were used to obtain the national analyses and how the different tasks linked together to produce the findings presented in Interim Report One. The blue arrows show the tasks and process followed for the choke analyses. The orange arrows show the process for the bioeconomic model, which will be reported in Interim Report Two.

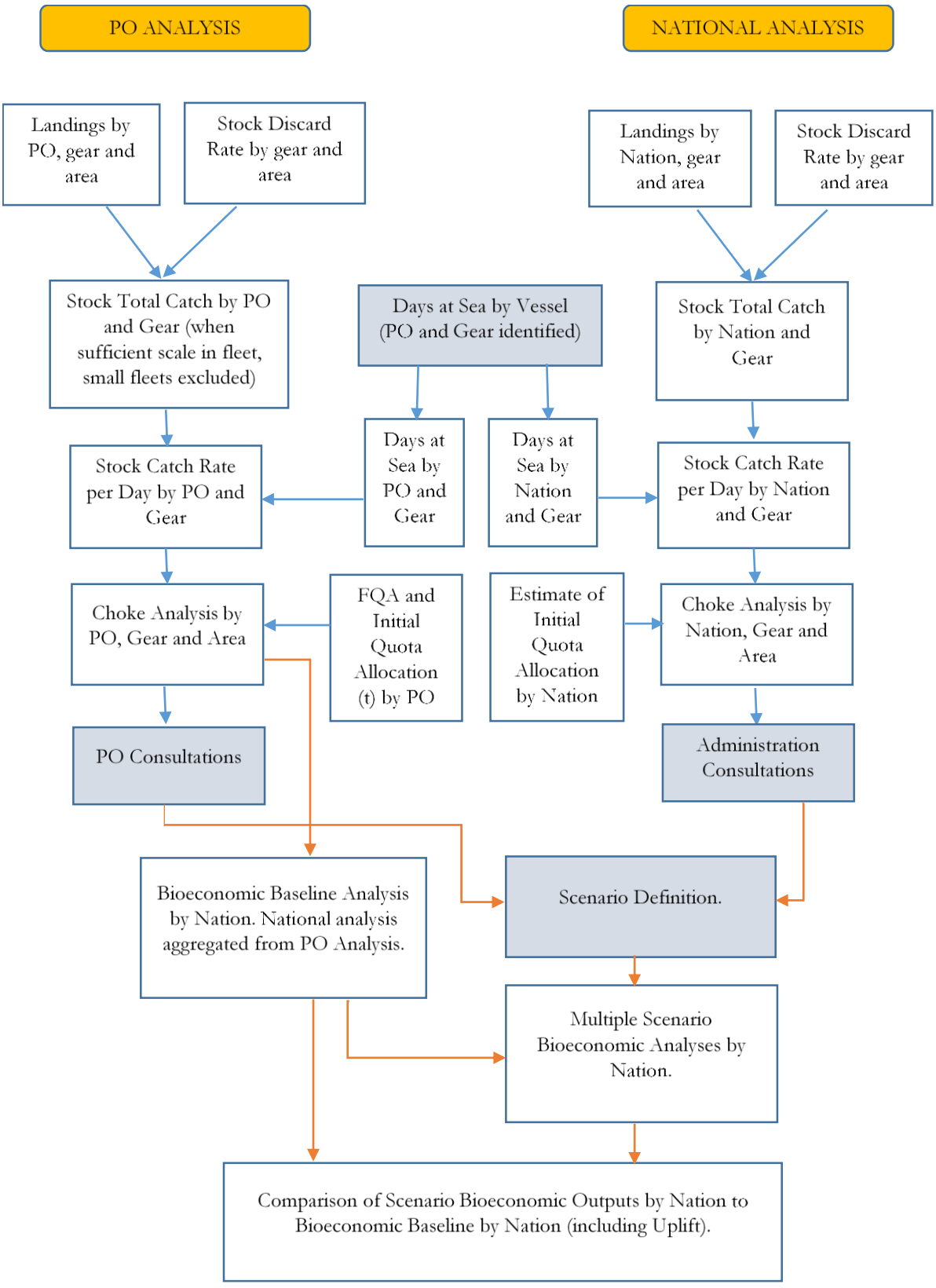

Figure 3-1: Analytical Process for the Choke Analysis and Bioeconomic Model

3.4. CALCULATIONS AND ASSUMPTIONS

Section 3.4 summarises key calculations and assumptions made in support of the choke analysis. Greater detail on the calculations is contained in Appendix A.

3.4.1. INITIAL QUOTA ALLOCATION

The initial quota allocation to each vessel is allocated to the fleet segment in which the vessel is included. Quota held on dummy licences has been distributed proportionately to vessels within that PO according to each vessel's proportion of landings of each species in 2013. Therefore, this reflects the use of e.g. nephrops quota held on the dummy licence being mostly landed by nephrops vessels in the same PO.

3.4.2. LEASING AND SWAPS OF QUOTA

The choke analysis is based on initial quota allocation to a fleet segment plus use of quota on dummy licenses as mentioned in 3.4.1. This means that additional quota for a species that was obtained from outside a vessel's own PO or obtained via international swaps during 2013 is not included in the choke analysis. This approach was taken as it is expected that trading patterns will change under a landing obligation. However, as quota has been aggregated at a fleet segment and home nation level in the choke analysis, it is anticipated that the aggregation of vessels from different POs has enabled the effect of potential 'swaps' within the home nation to be incorporated at a fleet segment level.

However, the choke analyses presented in Chapters 4-9 do provide a comparison of landings in 2013 to initial quota allocation for the first five choke species identified in each sea area. This helps to understand to what extent catch for a choke species in 2013 was dependent on additional quota being traded in during the year.

3.4.3. QUOTA UPLIFT

Quota uplift will be a mechanism under the landing obligation regime to augment existing TACs, relative to what they would have been under the old regime (recognising that this could be a reduction relative to the previous year in some cases). The justification is that estimated catch (landings + discards) was considered and the discard element taken into account when TACs were set. Quota uplift will enable estimated total catch volumes to be landed. The volume of uplift anticipated is expected to be based on ICES advice, and therefore consistent with achieving exploitation levels at Maximum Sustainable Yield (MSY). Quota uplift is calculated for each stock by calculating the percentage difference between the ICES estimate of a stock's total catch and the total TAC allocated for landings. This percentage is then multiplied by the 2013 quota to derive a 'quota uplift' figure.

It is assumed that 100% of quota uplift will be allocated to existing quota holders.

No uplift is assumed where ICES advice for 2013 gave no advice on total catch or where discards were not quantified and therefore total catch (landings + discards) could not be estimated from the ICES advice for 2013. The exception to this is sole, for which ICES assumes all catch is landed and no discards occur.

The ICES advice used in the choke analysis is from 2012 and therefore was relevant to 2013 (Table 2-1).

3.4.4. QUOTA FLEXIBILITY

The CFP Regulation 1380/2013 states in Article 15, Paragraph 8:

By way of derogation from the obligation to count catches against the relevant quotas in accordance with paragraph 1, catches of species that are subject to the landing obligation and that are caught in excess of quotas of the stocks in question, or catches of species in respect of which the Member State has no quota, may be deducted from the quota of the target species provided that they do not exceed 9 % of the quota of the target species. This provision shall only apply where the stock of the non-target species is within safe biological limits.

Therefore quota flexibility is an option to use up to 9% of a target species quota for a by-catch species if that by-catch species is within safe biological limits. It is understood that the terms 'target species' and 'by-catch species' are not technical definitions in this description of interspecies flexibility.

For the choke analysis the likelihood of the quota flexibility option being available is identified as this may assist in avoiding or reducing the impact of a choke species. ICES advice was used to determine whether stocks were within safe biological limits and therefore whether the quota flexibility option could be available for the stocks concerned.

The flexibility table (Table 3-2) identifies whether, according to the ICES advice from 2012, for 2013, a stock was considered to be within safe biological limits[1]:

- A 'yes' is given if ICES assessed the stock as within safe biological limits, indicating that quota flexibility may potentially be applied to that stock (using up to 9% of another 'species' quota for by-catch of the stock in question).
- A 'no' is given if ICES assessed the stock as being outside safe biological limits, or if no biological reference points were given, and so it cannot be determined if the stock in question was within safe biological limits.
- A 'n/a' is given where there is no quota for a species in a particular sea area.

ICES sub-area		IV	VI	VIIa	VIIb-k	VIId	VIIe
Haddock	HAD	113%	164%	100%	128%	128%	128%
Cod	COD	126%	100%	100%	112%	126%	112%
Whiting	WHI	165%	100%	100%	100%	165%	130%
Saithe	SAI	100%	100%	n/a	n/a	100%	n/a
Plaice	PLA	156%	n/a	284%	100%	100%	100%
Hake	HAK	105%	105%	105%	105%	105%	105%
Anglers	ANG	100%	100%	100%	100%	100%	100%
Megrim	MEG	118%	118%	n/a	124%	124%	124%
Nephrops	NEP	125%	123%	125%	125%	n/a	n/a
Pollack	POL	100%	100%	100%	100%	100%	100%
Lemons	LEM	100%	n/a	n/a	n/a	n/a	n/a
Dabs	DAB	100%	n/a	n/a	n/a	n/a	n/a
Turbot	TUR	100%	n/a	n/a	n/a	n/a	n/a
Skates & Rays	SKA	100%	100%	100%	100%	100%	100%
Sole	SOL	100%	n/a	100%	100%	100%	100%
Ling	LIN	100%	100%	100%	100%	100%	100%
Tusk	USK	100%	100%	100%	100%	100%	100%

This table provides the % uplift from ICES advice that was provided in 2012.

For Nephrops stocks with more than one functional unit, an average is given.

Table 3-1: Estimate of uplift by species, using data from ICES relating to 2013

[1] 'Within safe biological limits' i.e. F < FMSY and SSB > MSY Btrigger as defined by the Marine Strategy Framework Directive Descriptor 3 – commercial fish and shellfish. For more details see: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2014/WKGMSFDD3/WKGMSFDD3%20Final%20Report%202014.pdf

ICES sub-area		IV	VI	VIIa	VIIb-k	VIId	VIIe
Haddock	HAD	Yes	Yes	No	Yes	Yes	Yes
Cod	COD	No	No	No	Yes	No	No
Whiting	WHI	No	No	No	Yes	No	Yes
Saithe	SAI	Yes	Yes	n/a	n/a	yes	n/a
Plaice	PLA	Yes	n/a	No	No	No	No
Hake	HAK	Yes	Yes	Yes	Yes	Yes	Yes
Anglers	ANG	No	No	No	No	No	No
Megrim	MEG	Yes	Yes	n/a	No	No	No
Nephrops	NEP	No	No	No	No	n/a	n/a
Pollack	POL	No	No	No	No	No	No
Lemons	LEM	No	n/a	n/a	n/a	No	n/a
Dabs	DAB	No	n/a	n/a	n/a	n/a	n/a
Turbot	TUR	No	n/a	n/a	n/a	n/a	n/a
Skates & Rays	SKA	No	No	No	No	No	No
Sole	SOL	Yes	n/a	No	Yes	Yes	Yes
Ling	LIN	No	No	No	No	No	No
Tusk	USK	No	No	No	No	No	No

Table 3-2: Stocks for which quota flexibility is assumed to be available, using data from ICES relating to 2013

3.4.5. DISCARD RATES

The discard rates used in the choke analysis reflect discard data collected within the UK in 2011, 2012 and 2013. Discard data were provided by Cefas and Marine Scotland. Discard rates used in the choke analysis were calculated for each year, each fleet segment and each sea area i.e. a species discard rate for the whitefish trawl/seine fleet segment in the North Sea in 2013 may be different from the discard rate for the same species for the nephrops trawl segment in the North Sea. This specific and more tailored calculation of discard rates means that the discard rates used in the choke analysis do not match discard calculations made by ICES.

Discard rates for each species, each fleet segment and each year can be found in Appendix B.

Further detail on how discard rates have been adjusted and applied for different fleet segments is provided in Appendix A.

Choice of discard rate to use in the choke analysis has, in some cases, a substantial effect on the outcome of the choke analysis. Discard rates do vary depending on who calculates the rate and how this is done. The approach taken in the choke analysis can mean that there is substantial variation between the discard rate used and published discard rates. The choice of discard rate can have a substantial impact on the outcome of a choke analysis.

3.4.6. CATCH

By applying the calculated discard rate to the actual landings data for each species, a total annual catch volume per species and sea area was derived for each fleet segment for 2011, 2012 and 2013.

3.4.7. CATCH RATE

A species catch rate was calculated for each fleet segment in each sea area. The total annual catch of each species (by each fleet segment and in each sea area) was divided by actual fishing days (by each fleet segment and in each sea area) to give an average species catch rate per fishing day (tonnes/fishing day). An average catch rate per species was calculated for three years: 2011, 2012 and 2013.

3.4.8. QUOTA STOCKS NOT ALLOCATED TO POS

Throughout the choke analysis it has been assumed that a solution will be found to enable fishing in sea areas that contain stocks for which quota is not allocated. Clearly such stocks, including West of Scotland cod and whiting, are a potential choke, but it is not yet known how catches of these stocks might be addressed. Therefore these stocks are excluded from the quantitative choke analysis.

3.4.9. AREA VII

The different stocks in Area VII are analysed separately, but in presentation have been combined to consider impacts in Area VII as a single sea area. For example, Area VIIa cod and Area VIIb-k cod are analysed separately as they are different stocks with different quotas, but are presented as part of a choke analysis for Area VII as a whole. Therefore if one sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete Area VII fishing areas not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

4. WHITEFISH TRAWL AND SEINE CHOKE ANALYSIS FOR ENGLAND

4.1. INTRODUCTION

The over 10m England whitefish trawl/seine fleet segment consisted of 93 vessels in 2013 mostly fishing in Area VII (11,745 days, 77% of total days) and Area IV, North Sea, (3,548 days, 23% of total days). There was a small amount of activity by vessels in this segment (23 days in total) in West of Scotland.

Two choke analyses which consider the catching of demersal species by the England whitefish trawl/seine fleet segment in 2013 are presented below. The first choke analysis is for Area VII and the second is for Area IV (North Sea).

Each choke analysis includes:

- The first five species that would have been choke species for the England whitefish trawl/seine fleet segment in each sea area in 2013. The species are identified based on a comparison of initial quota allocation to the fleet segment and catching activity (actual landings + estimated discards) in 2013. For each sea area, the analysis includes:
    - The number of days that the initial quota allocation for each of the first five choke species would have allowed the England whitefish trawl/seine fleet segment to fish in 2013;
    - The importance of these first five choke species, in terms of volume, to the total landings of demersal quota species by the fleet segment in 2013; and
    - The extent to which discarding and quota trading appear to have been used to alleviate the lack of initial quota allocation for these five species in 2013.
- What impact a number of proposed rules for the demersal landing obligation might have had on the primary choke species, the first species that would have choked the fleet. The analysis considers:
    - Whether the primary choke species would have been the same species under the transitional rules (from 2016) and under full implementation (from 2019) of the landing obligation. The transitional rules for the whitefish trawl/seine fleet segment propose that cod, haddock, whiting and saithe are subject to the landing obligation from 2016 and that all other quota species are included from 2019;
    - The potential impact of quota uplift on fishing days, had 2012 advice from ICES on total catch been used to calculate quota uplift for 2013;
    - Whether it is likely that interspecies flexibility would have been available for the primary choke species in 2013; and
    - Whether the primary choke species would have been different if the analysis had been undertaken for 2011 or 2012, instead of 2013.
- Finally each choke analysis considers whether there were species where no quota was allocated to POs in 2013 in the sea areas where the fleet segment was active.

4.2. AREA VII

Table 4-1 summarises the activity of the England whitefish trawl/seine fleet segment in Area VII in 2013. There were 93 vessels in total in the fleet segment (not all vessels may have been active in Area VII) and the segment spent 11,745 days in Area VII, which represents an average per vessel of 126 days. In total the segment landed 5,946 tonnes of demersal quota species from Area VII.

	England whitefish trawl/seine fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	93 vessels
Total number of fishing days fleet segment spent in sea area in 2013	11,745 days
Average number of days per vessel spent in sea area in 2013	126 days
Total volume of landings of demersal quota species by fleet segment from sea area	5,946 tonnes

Table 4-1: England whitefish trawl/seine fleet segment activity in Area VII in 2013

The situation in Area VII is more complex than other sea areas as there are several stocks with quota determined by sub-area rather than Area VII as a whole. Therefore if one of these sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete Area VII fishing areas not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

It should also be noted that the target species for this fleet segment in Area VII includes non-quota species such as gurnard, squid, seabass and seabream. The total landings figure provided above does not include non-quota species.

4.2.1. FIRST FIVE CHOKE SPECIES IN AREA VII

The analysis below identifies the first five species that would have choked the activity of the England whitefish trawl/seine segment in Area VII in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

The analysis shows that sole 7D, cod 7BK and plaice 7DE would have been the first three species that the fleet segment would have run out of quota for in 2013, assuming no discarding or trading in of additional quota. All three would have had relatively similar impacts on the number of days available to the fleet segment.

Sole 7D would have been the primary choke species in 2013 i.e. the initial quota allocation of sole 7D would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for sole 7D would have been fully used after a total of 1,649 fishing days in 2013, which

compares to a total of 11,745 days the England whitefish trawl/seine fleet actually fished in Area VII in 2013. The number of fishing days that would have been available for this choke species equates to an average of 18 days of fishing per vessel. The average number of days per vessel actually fished in Area VII in 2013 was 126 days (Table 4-2).

In reality, discarding and trading in additional quota were both used to address the lack of initial quota allocation for these and other species in 2013. In 2013 the fleet segment appears to have largely addressed the lack of initial quota allocation for sole 7D by trading in quota, as landings equated to 701% of initial quota allocation and there was evidence of limited discarding (2% of catch). Sole 7D represented 2.5%, of the total landings of demersal species (with quotas) by the fleet segment in 2013 (Table 4-2).

Cod 7BK, which is identified as the second choke species, follows a very similar pattern to sole 7D. Cod 7BK had a comparatively low discard rate recorded in 2013 (3% of catch) and the lack of initial quota allocation appears to have largely been addressed by trading in quota, as landings equated to 556% of initial quota allocation. In terms of volume, cod was of similar importance as sole 7D to the segment, as the species represented 3% of total demersal quota species landings.

Plaice 7DE is third on the list and discarding (46% discard rate) appears to have been used to address the lack of initial quota allocation more than for sole 7D and cod 7BK, although trading in additional quota was also used as landings equated to 301% of initial quota allocation. Plaice 7DE was of more relative importance in terms of volume than sole 7D and cod 7BK as it represented just over 8% of the total volume of landings of demersal species with quotas by the fleet segment in 2013.

The other two species in the top five choke species, plaice 7FG and haddock 7BK, would have choked the fleet notably later than the first three species. Both would have created a choke after around 6,200 days of fishing which represents an average per vessel of 67 days. Plaice 7FG represented a very small percentage of the segment's total catch (0.1%). Haddock 7BK represented 11.6% of the volume of demersal quota species landings from Area VII in 2013 which made it one of the more important demersal species for the fleet segment in terms of volume. Landings of haddock 7BK equated to 151% of initial quota allocation suggesting some dependence on trading in of additional quota to address the lack of initial quota allocation. However, discarding also appears to have been used to address excess catch as the discard rate calculated for haddock 7BK was 20% of catch. There was negligible trading in of quota for plaice 7FG but, as stated, the volume landed of this species was very low (Table 4-2).

First five choke species in Area VII	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from Area VII in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in Area VII
	Total days for fleet segment	Average days per vessel				
Sole 7D	1,649	18	146	2.5%	701%	2%
Cod 7BK	2,054	22	176	3.0%	556%	3%
Plaice 7DE	2,119	23	491	8.3%	301%	46%
Plaice 7FG	6,197	67	6	0.1%	103%	46%
Haddock 7BK	6,254	67	691	11.6%	151%	20%

Table 4-2: First five choke species for the England whitefish trawl/seine fleet in Area VII, based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

4.2.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN AREA VII

The choke analysis presented above for Area VII identifies that the initial quota allocation of sole 7D would have been caught before any other species in 2013. Sole 7D was therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that sole would not immediately be subject to the landing obligation. Cod, haddock, whiting and saithe are the only species that could not be discarded by the fleet segment under the transitional rules. Therefore, in 2013, the first species that would have created a choke under the transitional rules was cod 7BK. As shown above it is estimated that the initial quota allocation of cod 7BK would have enabled the fleet segment to fish for 2,054 days in 2013. This equates to 22 days of fishing per vessel compared to the average of 18 days per vessel for sole 7D (Table 4-3).

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, sole 7D would have become the species that created a choke on the activity of the fleet in 2013.

Had the landing obligation, with transitional rules, been implemented in 2013, it is expected that cod 7BK would have had an uplift applied. This would have increased the number of fishing days available, under transitional rules, from 2,054 to 2,308 days, broadly equivalent to an extra three days per vessel. However, under full implementation of the landing obligation, no uplift would have been available for sole 7D to improve the choke situation (Table 4-3).

It is expected that interspecies flexibility would have been available for both species (Table 4-3).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, all three i.e. transitional rules, uplift for cod 7BK (but not sole 7D) and interspecies flexibility could have alleviated the impact of the landing obligation for the England whitefish trawl/seine fleet segment in Area VII had it been applied in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules (from 2016) cod 7BK was identified as the primary choke species in 2011, 2012 and 2013. As described above, sole 7D would have been the primary choke species under full implementation of the

landing obligation in 2013, but in 2011 and 2012 the primary choke species under full implementation of the landing obligation would have been cod 7BK.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	cod, haddock, whiting, saithe	all demersal quota species
Choke species in 2013	cod 7BK	sole 7D
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	2,054	1,649
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	22	18
Estimate of uplift for primary choke species in 2013	12%	Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	2,308	1,649
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	25	18
Would interspecies flexibility have been available for the choke species?	Yes	Yes

Table 4-3: The potential impact of transitional rules, uplift and interspecies flexibility for the England whitefish trawl/seine fleet in Area VII if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

4.2.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN AREA VII

There were no quota stocks for which no quota is allocated to POs in Area VII.

4.3. NORTH SEA (AREA IV)

Table 4-4 summarises the activity of the England whitefish trawl/seine fleet segment in the North Sea in 2013. There were 93 vessels in total in the fleet segment (not all vessels may have been active in the North Sea) and the segment spent 3,548 days in the North Sea, which represents an average per vessel of 37 days. In total the segment landed 15,388 tonnes of demersal quota species from the North Sea. This compares to 5,946 tonnes from Area VII, therefore although the fleet spent most days in Area VII, the North Sea was significantly more important in terms of the total volume of landings of demersal quota species. This is understood to be due to a combination of factors including that there are larger vessels operating in the North Sea and activity in Area VII targets more non-quota species such as gurnard, squid, seabass, seabream and turbot (turbot is a quota species in the North Sea).

	England whitefish trawl/seine fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	93 vessels
Total number of fishing days the fleet segment spent in the sea area in 2013	3,548 days
Average number of days per vessel spent in sea area in 2013	37 days
Total volume of landings of demersal quota species by fleet segment from sea area	15,388 tonnes

Table 4-4: England whitefish trawl/seine fleet segment activity in the North Sea in 2013

4.3.1. FIRST FIVE CHOKE SPECIES IN THE NORTH SEA (AREA IV)

The analysis below identifies the first five species that would have choked the activity of the England whitefish trawl/seine segment in the North Sea. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken to catch the initial quota allocation of a particular species.

The choke analysis shows that hake would have been the primary choke species for the England whitefish trawl/seine fleet in the North Sea in 2013 (Table 4-5). The initial quota allocation of hake would have been caught by the fleet segment after a total of 286 fishing days in 2013, which compares to a total of 3,548 days the England whitefish trawl/seine fleet actually fished in the North Sea in 2013. The number of fishing days that would have been available for this choke species equates to an average of three days of fishing per vessel. The average number of days per vessel actually fished in the North Sea in 2013 was 37 days.

Hake represented 1% of the total volume of landings of demersal quota species by the fleet segment in 2013. The fleet segment appears to have addressed the lack of initial quota allocation for hake through both discarding and securing additional quota. In 2013 hake had a discard rate of 36.2% of catch and landings in 2013 equated to 721% of initial quota allocation (Table 4-5).

The initial quota allocation for the other four species on the list would also have had a substantial impact on the days available to the fleet segment but to a lesser extent than hake. The other four species and their potential impact on the total days of fishing available for the fleet segment in 2013 are haddock (935 days), Ling (1,074 days), saithe (1,352 days) and whiting (1,451 days).

Saithe (fourth on the list) and haddock (second on the list) represented 23% and 18% of the landings from the North Sea respectively and therefore were amongst the most important species in terms of landings from the North Sea in 2013. The only species that was more important in terms of volume of landings was plaice (34%), which was not one of the first five species to choke the segment. Recorded discard rates suggest that 40% of the total catch of saithe was discarded and there is evidence that the lack of initial quota allocation was also addressed by trading in additional quota, as landings equated to 154% of initial quota allocation. The discard rate for haddock was comparatively low (9%) and the scale of trading in quota was relatively high as landings of haddock equated to 337% of initial quota allocation (Table 4-5).

Ling, which is third on the list, was of minor importance to the fleet in terms of volume as the species represented just 0.7% of the total volume landed. Discarding appears to have been used to address excess catch (30% discard rate), although the lack of initial quota allocation also appears to have been addressed by trading in additional quota as landings of ling equated to 221% of initial quota allocation.

Whiting, which is fifth on the list, represented just under 6% of the total volume of landings for the segment from the North Sea. With a recorded discard rate of 20% and a landings volume which equated to 190% of initial quota allocation, both discarding and quota trading were used to address the lack of initial quota allocation for whiting in 2013.

First five choke species in North Sea	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from North Sea in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in North Sea
	Total days for fleet segment	Average days per vessel				
Hake	286	3	214	1.4%	770%	36%
Haddock	935	10	2,706	17.6%	337%	9%
Ling	1,074	12	107	0.7%	221%	31%
Saithe	1,352	15	3,529	22.9%	154%	40%
Whiting	1,451	16	902	5.9%	190%	20%

Table 4-5: First five choke species for the England whitefish trawl/seine fleet in North Sea (Area IV), based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Table Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

4.3.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN THE NORTH SEA

The choke analysis presented above for the North Sea identifies that the initial quota allocation of hake would have been caught before any other species in 2013. Hake was therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that hake would not have been immediately subject to the landing obligation. Cod, haddock, whiting and saithe are the only species that could not be discarded by the fleet segment under the transitional rules as the fishery is

not defined by hake. Therefore, in 2013, the first species that would have created a choke under the transitional rules was haddock. As shown above, the initial quota allocation of haddock would have enabled the fleet segment to fish for 935 days in 2013. This equates to 10 days of fishing per vessel compared to the average of three days for hake (Table 4-6).

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, hake would have been the first species to create a choke on the activity of the fleet in 2013.

Both primary choke species, haddock (under the transitional rules from 2016) and hake (under the rules from 2019), could have had an uplift applied in 2013 according to ICES advice from 2012. The expected uplift would have been 13% for haddock and 5% for hake. Under the transitional rules this would increase the number of fishing days before haddock chokes the fleet segment from 935 days to 1,056. This would have equated to an average increase per vessel of 1.3 days. If the landing obligation had been fully implemented in 2013 the uplift for hake would have increased the number of fishing days before hake choked the fleet segment from 286 days to 300 days. This would have had very little impact on the days available to an average vessel (Table 4-6).

Interspecies flexibility could have been available for both haddock and hake (Table 4-6).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, transitional rules, uplift and flexibility, all three could have been available to alleviate the impact of the landing obligation for the England whitefish trawl/seine fleet segment in the North Sea in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules there was a difference in the primary choke species across the three years. Haddock was identified as the primary choke species in 2013, as discussed above, but saithe would have been the primary choke species, under the transitional rules, in 2011 and 2012. Hake would have been the primary choke species under full implementation of the landing obligation (from 2019) in 2011, 2012 and 2013.

	Application of transitional rules (from 2016) to activity in 2013	Full implementation of landing obligation (from 2019) to activity in 2013
Species covered by landing obligation	cod, haddock, whiting, saithe	all demersal quota species
Choke species in 2013	haddock	hake
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for choke species was used up	935	286
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	10	3
Estimate of uplift for choke species in 2013	13%	5%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	1,056	300
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	11	3
Would interspecies flexibility have been available for the choke species?	Yes	Yes

Table 4-6: The potential impact of transitional rules, uplift and interspecies flexibility for the England whitefish trawl/seine fleet in North Sea if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

4.3.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN NORTH SEA (AREA IV)

There were no quota stocks for which no quota is allocated to POs in the North Sea.

5. NEPHROPS TRAWL CHOKE ANALYSIS FOR ENGLAND

5.1. INTRODUCTION

The over 10m England nephrops fleet segment consisted of 35 vessels in 2013 fishing in the North Sea (2,811 days, 72% of total days), Area VII (587 days, 15% of total days) and West of Scotland (486 days, 13% of total days).

Three choke analyses which consider the catching of demersal species by the England nephrops trawl fleet segment in 2013 are presented below. The first choke analysis is for the North Sea, the second is for Area VII and the third is for West of Scotland.

Each choke analysis includes:

- The first five species that would have been choke species for the England nephrops trawl fleet segment in each sea area in 2013. The species are identified based on a comparison of initial quota allocation to the fleet segment and catching activity (actual landings + estimated discards) in 2013. For each sea area, the analysis includes:
    - The number of days that the initial quota allocation for each of the first five choke species would have allowed the England nephrops trawl fleet segment to fish in 2013;
    - The importance of these first five choke species, in terms of volume, to the total landings of demersal quota species by the fleet segment in 2013; and
    - The extent to which discarding and quota trading appear to have been used to alleviate the lack of initial quota allocation for these five species in 2013.
- What impact a number of proposed rules for the demersal landing obligation might have had on the primary choke species, the first species that would have choked the fleet. The analysis considers:
    - Whether the primary choke species would have been the same species under the transitional rules (from 2016) and under full implementation (from 2019) of the landing obligation. The transitional rules for the nephrops trawl fleet segment propose that only nephrops is subject to the landing obligation from 2016 and that all other quota species are included from 2019;
    - The potential impact of quota uplift on fishing days, had 2012 advice from ICES on total catch been used to calculate quota uplift for 2013;
    - Whether it is likely that interspecies flexibility would have been available for the primary choke species in 2013; and
    - Whether the primary choke species would have been different if the analysis had been undertaken for 2011 or 2012, instead of 2013.
- Finally each choke analysis considers whether there were species where no quota was allocated to POs in 2013 in the sea areas where the fleet segment was active.

5.2. NORTH SEA (AREA IV)

Table 5-1 summarises the activity of the England nephrops fleet segment in the North Sea in 2013. There were 35 vessels in total in the fleet segment (not all vessels may have been active in the North Sea) and the segment spent 2,811 days in the North Sea, which represented an average per vessel of 80 days. In total the segment landed 1,349 tonnes of demersal quota species from the North Sea.

	England nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in North Sea in 2013)*	35 vessels
Total number of fishing days the fleet segment spent in the sea area in 2013	2,811 days
Average number of days per vessel spent in sea area in 2013	80 days
Total volume of landings of demersal quota species by fleet segment from sea area	1,349 tonnes

Table 5-1: England nephrops fleet segment activity in the North Sea in 2013

5.2.1. FIRST FIVE CHOKE SPECIES IN THE NORTH SEA (AREA IV)

The analysis below identifies the first five species that would have choked the activity of the England nephrops trawl fleet segment in the North Sea. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken to catch the initial quota allocation of a particular species.

The choke analysis shows that hake would have been the primary choke species for the England nephrops trawl fleet in the North Sea in 2013 (Table 5-2). The initial quota allocation of hake would have been caught by the fleet segment after a total of 150 fishing days in 2013. This compares to a total of 2,811 days the England nephrops trawl fleet actually fished in the North Sea in 2013. The number of fishing days that would have been available for this choke species equates to an average of four days fishing per vessel. The average number of days per vessel actually fished in the North Sea in 2013 was 80 days.

The first three species identified as choke species, hake, tusk and dabs, each represented less than 1% of the total volume of landings of demersal species (with quotas) by the England nephrops fleet segment in 2013. These choke species appear to come about because of high discard rates of between 94% and 100%. With a low volume of landings and high discards it can be assumed that these species are unwanted by-catch of the fishing activity of the fleet segment (Table 5-2). It is also likely that quota for these species has been leased out.

Tusk and dabs would have had a less dramatic impact on the available days at sea compared to hake but still would have reduced the activity of the fleet to an average per vessel of 18 and 22 days respectively.

Haddock (fourth on the list) and cod (fifth on the list) represented 13% and 3% of the landings from the North Sea respectively and therefore were more important species in terms of landings from the North Sea in 2013 than hake, tusk and dabs. Haddock is the only quota on the list for which any volume appears to have been traded in, as landings of 178 tonnes equated to 123% of initial quota allocation for haddock. The calculated discard rate for haddock was 16% and 71% for cod (Table 5-2).

First five choke species in North Sea	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from North Sea in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in North Sea
	Total days for fleet segment	Average days per vessel				
Hake	150	4	5	0.4%	120%	94%
Tusk	639	18	0	0.0%	0%	100%
Dabs	763	22	1	0.1%	3%	100%
Haddock	1,924	55	178	13.2%	123%	16%
Cod	2,261	65	46	3.4%	36%	71%

Table 5-2: First five choke species for the England nephrops trawl fleet in North Sea (Area IV), based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Table Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

5.2.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN THE NORTH SEA

The choke analysis presented above for the North Sea identifies that the initial quota allocation of hake would have been caught before any other species in 2013. Hake was therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that hake would not have been immediately subject to the landing obligation. Nephrops is the only species that could not be discarded by the fleet segment under the transitional rules. Therefore as the landings of nephrops in 2013 did not exceed initial quota allocation there would have been no choke species in the North Sea.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, hake would have been the first species to create a choke on the activity of the fleet in 2013.

Under the rules of the landing obligation from 2019, hake could have had an uplift applied in 2013 according to ICES advice from 2012. The expected uplift would have been 5% for hake. This would increase the number of fishing days before hake chokes the fleet segment from 150 days to 158. This would have very little impact on the average number of days available per vessel (Table 5-3).

It is expected that interspecies flexibility could have been available for hake (Table 5-3).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, transitional rules, uplift and flexibility, all three could have been available to alleviate the impact of the landing obligation for the England nephrops fleet segment in the North Sea in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules there was a difference in the primary choke species across the three years. Nephrops would have created a choke in 2012, but not in 2011 or 2013 (as discussed above). Under full implementation of the landing obligation the primary choke species identified above was hake for 2013, but in 2011 it would have been tusk and in 2012 it would have been dabs.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	none	hake
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for choke species was used up		150
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up		4
Estimate of uplift for choke species in 2013		5%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift		158
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift		5
Would interspecies flexibility have been available for the choke species?		Yes

Table 5-3: The potential impact of transitional rules, uplift and interspecies flexibility for the England nephrops trawl fleet in North Sea if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

5.2.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN NORTH SEA (AREA IV)

There were no quota stocks for which no quota is allocated to POs in the North Sea.

5.3. AREA VII

Table 5-4 summarises the activity of the England nephrops trawl fleet segment in Area VII in 2013. There were 35 vessels in total in the fleet segment (not all vessels may have been active in Area VII) and the segment spent 587 days in Area VII, which represents an average per vessel of 17 days. In total the segment landed 93 tonnes of demersal quota species from Area VII.

	England nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	35 vessels
Total number of fishing days fleet segment spent in sea area in 2013	587 days
Average number of days per vessel spent in sea area in 2013	17 days
Total volume of landings of demersal quota species by fleet segment from sea area	93 tonnes

Table 5-4: England nephrops trawl fleet segment activity in Area VII in 2013

The situation in Area VII is more complex than other sea areas as there are several stocks with quota determined by sub-area rather than Area VII as a whole. Therefore if one of these sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete fishing areas not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

5.3.1. FIRST FIVE CHOKE SPECIES IN AREA VII

The analysis below identifies the first five species that would have choked the activity of the England nephrops trawl segment in Area VII in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

Whiting 7BK would have been the primary choke species in 2013 i.e. the initial quota allocation of whiting 7BK would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for whiting 7BK would have been fully used after a total of 284 fishing days in 2013. This compares to a total of 587 days the England nephrops trawl fleet actually fished in Area VII in 2013. The number of fishing days that would have been available for this choke species equates to an average of 8 days of fishing per vessel. The average number of days per vessel actually fished in Area VII in 2013 was 17 days (Table 5-5).

However, the analysis shows that there are a number of demersal species that would have created a significant choke for the fleet segment, assuming no discarding or trading in of additional quota. The first five are identified as whiting 7BK (as discussed above), megrim, plaice 7DE, plaice 7A and sole 7A and

these are expected to have had relatively similar impacts on the number of days available to the fleet segment by reducing the activity of the fleet to between an average of 8-12 days per vessel.

Information on discard rates and landings as a percentage of initial quota allocation suggests that discarding was used to address unwanted catch of whiting and plaice and the initial quota allocation of these species was not landed. It is likely that quota for these species has been leased out. However, there appears to be no discarding of above quota catch of megrim (second on the list) and sole 7A (fifth on the list) and the lack of initial quota allocation appears to have been addressed for both species by trading in additional quota as landings equated to 163% and 135% respectively

First five choke species in Area VII	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from Area VII in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in Area VII
	Total days for fleet segment	Average days per vessel				
Whiting 7BK	284	8	3	2.8%	93%	55%
Megrim	361	10	0	0.1%	163%	0%
Plaice 7DE	365	10	1	0.7%	24%	85%
Plaice 7A	409	12	10	10.3%	22%	85%
Sole 7A	435	12	1	0.5%	135%	0%

Table 5-5: First five choke species for the England nephrops trawl fleet in Area VII, based on initial quota allocation of all demersal quota species to the fleet segment in 2013..

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

5.3.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN AREA VII

The choke analysis presented above for Area VII identifies that the initial quota allocation of whiting 7BK would have been caught before any other species in 2013. Whiting 7BK was therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that whiting would not immediately be subject to the landing obligation. Nephrops is the only species that could not be discarded by the fleet segment under the transitional rules. Therefore, in 2013, as the landings of nephrops did not exceed initial quota allocation there would be no choke species in the Area VII under the proposed transitional rules of the landing obligation.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, whiting 7BK would have become the species that created a choke on the activity of the fleet in 2013.

Had the landing obligation been fully implemented in 2013 it is expected that no uplift would have been available for whiting 7BK. However, it is expected that interspecies flexibility would have been available for whiting 7BK (Table 5-6).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, transitional rules, uplift and flexibility, only uplift would not have been available to alleviate the impact of the landing obligation for the England nephrops fleet segment in the Area VII in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules there was a difference in the primary choke species across the three years. Nephrops would have created a choke in 2011, but not in 2012 or 2013 (as discussed above). Under full implementation of the landing obligation the primary choke species identified above was whiting 7BK for 2013, but in 2011 it would have been nephrops and in 2012 it was megrim.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	none	whiting 7BK
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up		284
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up		8
Estimate of uplift for primary choke species in 2013		Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift		284
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift		8
Would interspecies flexibility have been available for the choke species?		Yes

Table 5-6: The potential impact of transitional rules, uplift and interspecies flexibility for the England nephrops trawl fleet in Area VII if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

5.3.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN AREA VII

There were no quota stocks for which no quota is allocated to POs in Area VII.

5.4. WEST OF SCOTLAND (AREA VI)

Table 5-4 summarises the activity of the England nephrops fleet segment in West of Scotland (Area VI) in 2013. There were 35 vessels in total in the fleet segment (not all vessels may have been active in Area VI) and the segment spent 486 days in West of Scotland, which represents an average per vessel of 14 days. In total the segment landed 78 tonnes of demersal quota species from West of Scotland.

	England nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VI in 2013)*	35 vessels
Total number of fishing days fleet segment spent in sea area in 2013	486 days
Average number of days per vessel spent in sea area in 2013	14 days
Total volume of landings of demersal quota species by fleet segment from sea area	78 tonnes

Table 5-7: England nephrops trawl fleet segment activity in Area VI in 2013

5.4.1. FIRST FIVE CHOKE SPECIES IN WEST OF SCOTLAND

There are no choke species identified for the England nephrops trawl fleet in West of Scotland in 2013. This is due to a lack of data that can be used to conduct a choke analysis.

5.4.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN WEST OF SCOTLAND

The initial quota allocations to the England nephrops trawl fleet were not fully caught in 2013.

The choke analysis and impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules there was no choke species in any of the three years. However, under full implementation of the landing obligation hake was identified as a choke species in 2011 and saithe was identified in 2012.

5.4.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN WEST OF SCOTLAND

Cod West of Scotland had no quota allocated to POs which had the potential to create difficulties for the nephrops fleet operating in this area.

6. BEAM TRAWL CHOKE ANALYSIS FOR ENGLAND

6.1. INTRODUCTION

The over 10m England beam trawl fleet segment consisted of 70 vessels in 2013 mostly fishing in Area VII (10,083 days, 70% of total days) and Area IV, North Sea, (4,303 days, 30% of total days). There was also one day of fishing activity recorded in the West of Scotland.

Two choke analyses which consider the catching of demersal species by the England beam trawl fleet segment in 2013 are presented below. The first choke analysis is for Area VII and the second is for Area IV (North Sea).

Each choke analysis includes:

- The first five species that would have been choke species for the England beam trawl fleet segment in each sea area in 2013. The species are identified based on a comparison of initial quota allocation to the fleet segment and catching activity (actual landings + estimated discards) in 2013. For each sea area, the analysis includes:
    - The number of days that the initial quota allocation for each of the first five choke species would have allowed the England beam trawl fleet segment to fish in 2013;
    - The importance of these first five choke species, in terms of volume, to the total landings of demersal quota species by the fleet segment in 2013; and
    - The extent to which discarding and quota trading appear to have been used to alleviate the lack of initial quota allocation for these five species in 2013.
- What impact a number of proposed rules for the demersal landing obligation might have had on the primary choke species, the first species that would have choked the fleet. The analysis considers:
    - Whether the primary choke species would have been the same species under the transitional rules (from 2016) and under full implementation (from 2019) of the landing obligation. The transitional rules for the beam trawl fleet segment propose that common sole and plaice are subject to the landing obligation from 2016 and that all other quota species are included from 2019;
    - The potential impact of quota uplift on fishing days, had 2012 advice from ICES on total catch been used to calculate quota uplift for 2013;
    - Whether it is likely that interspecies flexibility would have been available for the primary choke species in 2013; and
    - Whether the primary choke species would have been different if the analysis had been undertaken for 2011 or 2012, instead of 2013.
- Finally each choke analysis considers whether there were species where no quota was allocated to POs in 2013 in the sea areas where the fleet segment was active.

6.2. AREA VII

Table 6-1 summarises the activity of the England beam trawl fleet segment in Area VII in 2013. There were 70 vessels in total in the fleet segment (not all vessels may have been active in Area VII) and the segment spent 10,083 days in Area VII, which represents an average per vessel of 144 days. In total the segment landed 4,783 tonnes of demersal quota species from Area VII.

	England beam trawl fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	70 vessels
Total number of fishing days fleet segment spent in sea area in 2013	10,083 days
Average number of days per vessel spent in sea area in 2013	144 days
Total volume of landings of demersal quota species by fleet segment from sea area	4,783 tonnes

Table 6-1: England beam trawl fleet segment activity in Area VII in 2013

The situation in Area VII is more complex than other sea areas as there are several stocks with quota determined by sub-area rather than Area VII as a whole. Therefore if one of these sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete fishing areas not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

6.2.1. FIRST FIVE CHOKE SPECIES IN AREA VII

The analysis below identifies the first five species that would have choked the activity of the England beam trawl segment in Area VII in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

The analysis shows that plaice 7HJK and cod 7BK would have been the first two species that the fleet segment would have run out of quota for in 2013, assuming no discarding or trading in of additional quota. Both would have had relatively similar impacts on the number of days available to the fleet segment.

Plaice 7HJK would have been the primary choke species in 2013 i.e. the initial quota allocation of plaice 7HJK would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for plaice 7HJK would have been fully used after a total of 3,091 fishing days in 2013. This compares to a total of 10,083 days the England beam trawl fleet actually fished in Area VII in 2013. The number of fishing days that would have been available for this choke species equates to an average of 44 days of fishing per vessel. The average number of days per vessel actually fished in Area VII in 2013 was 144 days (Table 6-1).

In reality, discarding and trading in additional quota were both used to address the lack of initial quota allocation in 2013. In 2013 the fleet segment appears to have addressed the lack of initial quota allocation for plaice 7HJK by trading in quota, as landings equated to 267% of initial quota allocation, and there was evidence of discarding (18%). However, plaice 7HJK represented less than 1% of the total landings of demersal species (with quotas) by the fleet segment in 2013 (Table 6-2).

Cod 7BK is identified as the second choke species. Cod 7BK had a comparatively low discard rate recorded in 2013 (4%) and the lack of initial quota allocation appears to have largely been addressed by trading in quota, as landings equated to 309% of initial quota allocation. In terms of volume cod was of greater importance than plaice 7HJK, as the species represented 2.3% of total demersal quota species landings.

Of the other three species on the list, anglers was of greatest importance to the fleet in terms of volume. Anglers represented 41.5% of the total landings of demersal quota species by the beam trawl fleet from Area VII. Anglers is fifth on the list and would have created a choke after around 7,225 days of fishing which represents an average per vessel of 103 days. Landings of anglers equated to 140% of initial quota allocation suggesting some dependence on trading in of additional quota to address the lack of initial quota allocation. Discarding does not appear to have been used for excess catch of anglers (Table 6-2).

First five choke species in Area VII	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from Area VII in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in Area VII
	Total days for fleet segment	Average days per vessel				
Plaice 7HJK	3,091	44	35	0.7%	267%	18%
Cod 7BK	3,128	45	112	2.3%	309%	4%
Haddock 7BK	5,243	75	118	2.5%	165%	14%
Plaice 7FG	5,862	84	22	0.5%	141%	18%
Anglers	7,225	103	1,987	41.5%	140%	0%

Table 6-2: First five choke species for the England beam trawl fleet in Area VII, based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

6.2.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN AREA VII

The choke analysis presented above for Area VII identifies that the initial quota allocation of plaice 7HJK would have been caught before any other species in 2013. Plaice 7HJK was therefore the primary choke species.

The proposed transitional rules (from 2016) mean that common sole and plaice are the only species that could not be discarded by the fleet segment. Therefore, in 2013, the first species that would have created a choke under the transitional rules was the primary choke species identified above, plaice 7HJK.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. However, as the primary choke species, plaice 7HJK, was subject to the landing obligation under the transitional rules, the choke remains the same (Table 6-3).

Had the landing obligation been implemented in 2013, it is expected that plaice 7HJK would not have had an uplift applied. It is also expected that interspecies flexibility would not have been available for plaice 7HJK (Table 6-3).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, i.e. transitional rules, uplift and interspecies flexibility, none of them would have alleviated the impact of the landing obligation for the England beam trawl fleet segment in Area VII in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules (from 2016) plaice 7HJK was identified as the primary choke species in 2011, 2012 and 2013. As described above, plaice 7HJK would also have been the primary choke species under full implementation of the landing obligation in 2013, but in 2011 and 2012 the primary choke species under full implementation of the landing obligation would have been cod 7BK.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	common sole and plaice	all demersal quota species
Choke species in 2013	Plaice 7HJK	Plaice 7HJK
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	3,091	3,091
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	44	44
Estimate of uplift for primary choke species in 2013	Uplift not available	Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	3,091	3,091
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	44	44
Would interspecies flexibility have been available for the choke species?	No	No

Table 6-3: The potential impact of transitional rules, uplift and interspecies flexibility for the England beam trawl fleet in Area VII if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

6.2.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN AREA VII

There were no quota stocks for which no quota is allocated to POs in Area VII.

6.3. NORTH SEA (AREA IV)

Table 6-4 summarises the activity of the England beam trawl fleet segment in the North Sea in 2013. There were 70 vessels in total in the fleet segment (not all vessels may have been active in the North Sea) and the segment spent 4,303 days in the North Sea, which represents an average per vessel of 61 days. In total the segment landed 10,221 tonnes of demersal quota species from the North Sea.

	England beam trawl fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area IV in 2013)*	70 vessels
Total number of fishing days the fleet segment spent in the sea area in 2013	4,303 days
Average number of days per vessel spent in sea area in 2013	61 days
Total volume of landings of demersal quota species by fleet segment from sea area	10,221 tonnes

Table 6-4: England beam trawl fleet segment activity in the North Sea in 2013

6.3.1. FIRST FIVE CHOKE SPECIES IN THE NORTH SEA (AREA IV)

The analysis below identifies the first five species that would have choked the activity of the England beam trawl segment in the North Sea. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken to catch the initial quota allocation of a particular species.

The choke analysis shows that plaice would have been the primary choke species for the England beam trawl fleet in the North Sea in 2013 (Table 6-5). The initial quota allocation of plaice would have been caught by the fleet segment after a total of 462 fishing days in 2013. This compares to a total of 4,303 days the England beam trawl fleet actually fished in the North Sea in 2013. The number of fishing days that would have been available for this choke species equates to an average of seven days of fishing per vessel. The average number of days per vessel actually fished in the North Sea in 2013 was 61 days.

Plaice represented 89% of the total volume of landings of demersal species (with quotas) by the fleet segment from the North Sea in 2013. The fleet segment appears to have only addressed the lack of initial quota allocation for plaice through discarding as a substantial discard rate of 92% has been calculated for plaice, and landings in 2013 were less than initial quota allocation (77%) (Table 6-5).

Whiting would also have had a substantial impact on the days available to the fleet segment. However, only 6% of the initial quota allocation was actually landed in 2013. It appears that whiting was an unwanted catch and discarding was calculated to be very high at 99% of catch. It was the high level of discarding that made whiting a choke species and the estimated catch rate for whiting could have reduced the activity of the fleet to an average of eight days per vessel.

It is considered likely that quota for whiting was leased out.

First five choke species in North Sea	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from North Sea in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in North Sea
	Total days for fleet segment	Average days per vessel				
Plaice	462	7	9,057	88.6%	77%	92%
Whiting	565	8	4	0.0%	6%	99%
Sole	3,349	48	357	3.5%	111%	14%
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Table 6-5: First five choke species for the England beam trawl fleet in North Sea (Area IV), based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Table Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

6.3.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN THE NORTH SEA

The choke analysis presented above for the North Sea identifies that the initial quota allocation of plaice would have been caught before any other species in 2013. Plaice was therefore the primary choke species.

The proposed transitional rules (from 2016) mean that common sole and plaice are the only species that could not be discarded by the fleet segment. Therefore, in 2013, the first species that would have created a choke under the transitional rules was the primary choke species identified above, plaice.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. However, as the primary choke species, plaice, was subject to the landing obligation under the transitional rules, the choke remains the same (Table 6-6).

Plaice could have had an uplift applied in 2013 according to ICES advice from 2012. The expected uplift would have been 56%. Under the transitional rules this would increase the number of fishing days before plaice chokes the fleet segment from 462 days to 720. This would have equated to an average increase per vessel of three days (Table 6-6).

It is expected that interspecies flexibility could have been available for plaice (Table 6-6).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, transitional rules, uplift and flexibility, both uplift and flexibility could have been available to alleviate the impact of the landing obligation for the England beam trawl fleet segment in the North Sea in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules (from 2016) plaice was identified as the primary choke species in 2011, 2012 and 2013. As described above, plaice 7HJK would also have been the primary choke species under full implementation of the landing obligation in 2012 and 2013, but in 2011 the primary choke species under full implementation of the landing obligation would have been whiting.

	Application of	Full implementation

	transitional rules (from 2016) to activity in 2013	of landing obligation (from 2019) to activity in 2013
Species covered by landing obligation	common sole and plaice	all demersal quota species
Choke species in 2013	plaice	plaice
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for choke species was used up	462	462
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	7	7
Estimate of uplift for choke species in 2013	56%	56%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	720	720
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	10	10
Would interspecies flexibility have been available for the choke species?	Yes	Yes

Table 6-6: The potential impact of transitional rules, uplift and interspecies flexibility for the England beam trawl fleet in North Sea if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

6.3.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN THE NORTH SEA (AREA IV)

There were no quota stocks for which no quota is allocated to POs in the North Sea.

7. NEPHROPS TRAWL CHOKE ANALYSIS FOR NORTHERN IRELAND

7.1. INTRODUCTION

The over 10m Northern Ireland nephrops trawl fleet segment consisted of 99 vessels in 2013 mostly fishing in Area VII (10,659 days, 77% of total days) and Area VI, West of Scotland (2,338 days, 17% of total days) and Area IV, North Sea, (767 days, 6% of total days).

Three choke analyses which consider the catching of demersal species by the Northern Ireland nephrops trawl fleet segment in 2013 are presented below. The first choke analysis is for Area VII, the second is for Area VI (West of Scotland) and the third is for Area IV (North Sea).

Each choke analysis includes:

- The first five species that would have been choke species for the Northern Ireland nephrops trawl fleet segment in each sea area in 2013. The species are identified based on a comparison of initial quota allocation to the fleet segment and catching activity (actual landings + estimated discards) in 2013. For each sea area, the analysis includes:
    - The number of days that the initial quota allocation for each of the first five choke species would have allowed the Northern Ireland nephrops fleet segment to fish in 2013;
    - The importance of these first five choke species, in terms of volume, to the total landings of demersal quota species by the fleet segment in 2013; and
    - The extent to which discarding and quota trading appear to have been used to alleviate the lack of initial quota allocation for these five species in 2013.
- What impact a number of proposed rules for the demersal landing obligation might have had on the primary choke species, the first species that would have choked the fleet. The analysis considers:
    - Whether the primary choke species would have been the same species under the transitional rules (from 2016) and under full implementation (from 2019) of the landing obligation. The transitional rules for the nephrops trawl fleet segment propose that only nephrops is subject to the landing obligation from 2016 and that all other demersal quota species are included from 2019;
    - The potential impact of quota uplift on fishing days, had 2012 advice from ICES on total catch been used to calculate quota uplift for 2013;
    - Whether it is likely that interspecies flexibility would have been have been available for the primary choke species in 2013; and
    - Whether the primary choke species would have been different if the analysis had been undertaken for 2011 or 2012, instead of 2013.
- Finally each choke analysis considers whether there were species where no quota was allocated to POs in 2013 in the sea areas where the fleet segment was active.

7.2. AREA VII

Table 7-1 summarises the activity of the Northern Ireland nephrops trawl fleet segment in Area VII in 2013. There were 99 vessels in total in the fleet segment (not all vessels may have been active in Area VII) and the segment spent 10,659 days in Area VII, which represents an average per vessel of 108 days. In total the segment landed 517 tonnes of demersal quota species from Area VII.

	Northern Ireland nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	99 vessels
Total number of fishing days fleet segment spent in sea area in 2013	10,659 days
Average number of days per vessel spent in sea area in 2013	108 days
Total volume of landings of demersal quota species by fleet segment from sea area	6,573 tonnes

Table 7-1: Northern Ireland nephrops fleet segment activity in Area VII in 2013

The situation in Area VII is more complex than other sea areas as there are several stocks with quota determined by sub-area rather than Area VII as a whole. Therefore if one of these sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete fishing areas not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

7.2.1. FIRST FIVE CHOKE SPECIES IN AREA VII

The analysis below identifies the first five species that would have choked the activity of the Northern Ireland nephrops trawl segment in Area VII in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

Cod 7BK would have been the primary choke species in 2013 i.e. the initial quota allocation of cod 7BK would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for cod 7BK would have been fully used after a total of 3,055 fishing days in 2013, which compares to a total of 10,659 days the Northern Ireland nephrops trawl fleet actually fished in Area VII in 2013. The number of fishing days that would have been available for this choke species equates to an average of 31 days of fishing per vessel. The average number of days per vessel actually fished in Area VII in 2013 was 108 days (Table 7-2).

In 2013 the fleet segment appears to have fully addressed the lack of initial quota allocation for cod 7BK by trading in quota, as landings equated to 349% of initial quota allocation and the discard rate was calculated as zero. Cod 7BK represented only 0.2%, of the total landings of demersal species (with quotas) by the fleet segment in 2013 (Table 7-2).

Plaice 7FG, plaice 7A and whiting 7A are also identified as species that would have choked the fleet segment early. These species also each represent less than 1% of the total volume of landings of demersal species with quotas. However, unlike cod 7BK, these species appear to be unwanted catch as the initial quota allocation for all three species was not landed in 2013 and calculated discard rates are relatively high. It is considered likely that the unused quota for these species has been leased out.

Cod 7A is the fifth species on the list and, of all five species, cod 7A represented the most important species in terms of volume of total catch as it represented 1.5% of landings. The calculated discard rate in 2013 was 0% and the lack of initial quota allocation in 2013 appears to have been addressed by trading in additional quota as landings equated to 175% of initial quota allocation.

First five choke species in Area VII	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from Area VII in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in Area VII
	Total days for fleet segment	Average days per vessel				
Cod 7BK	3,055	31	11	0.2%	349%	0%
Plaice 7FG	3,293	33	0	0.0%	49%	85%
Plaice 7A	5,237	53	37	0.6%	31%	85%
Whiting 7A	5,783	58	18	0.3%	83%	55%
Cod 7A	6,079	61	99	1.5%	175%	0%

Table 7-2: First five choke species for the Northern Ireland nephrops trawl fleet in Area VII, based on initial quota allocation of all demersal quota species to the fleet segment in 2013..

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

7.2.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN AREA VII

The choke analysis presented above for Area VII identifies that the initial quota allocation of cod 7BK would have been caught before any other species in 2013. Cod 7BK was therefore the primary choke species.

The proposed transitional rules (from 2016) mean that nephrops is the only species that could not be discarded by the fleet segment. Although not featured on the first five list, the choke analysis does indicate that nephrops would have caused a choke on the fleet segment. However this would have occurred after 10,543 days of fishing activity compared to the 10,659 days actually fished in 2013. The choke would have occurred as, despite 98% of the initial quota allocation for nephrops being landed, the discard rate recorded for the fleet segment was 2.8%, which means that total catch exceeded initial quota allocation by a small amount.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, cod 7BK would have become the species that created a choke on the activity of the fleet in 2013 and fishing activity would have been reduced, as discussed above, to 3,055 days in total or 31 days on average per vessel.

Had the landing obligation, with transitional rules, been implemented in 2013, it is expected that nephrops would have had an uplift applied. This would have increased the number of fishing days available, under transitional rules, from 10,543 to 13,179 days. This would mean that the choke would

no longer have existed as 13,179 days would have exceeded the days required to catch the initial quota allocation to the fleet segment.

Under full implementation of the landing obligation, a quota uplift would also have been available for cod 7BK to improve the choke situation in 2013. The uplift, based on ICES advice from 2012, would have provided an additional 12% of quota. This would have increased the total days available to the fleet segment from 3,055 to 3,434, significantly below the 10,659 days actually fished in 2013. Under full implementation of the landing obligation the impact of uplift for cod 7BK would result in an average of 35 days per vessel (Table 7-3).

It is expected that interspecies flexibility would not have been available for nephrops under the transitional rules (from 2016) although it does not appear that it would have been required. Interspecies flexibility would have been available for cod 7BK (Table 7-3).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, all three i.e. transitional rules, quota uplift and interspecies flexibility for cod 7BK, could have alleviated the impact of the landing obligation for the Northern Ireland nephrops fleet segment in Area VII in 2013.

The impact of the landing obligation was also considered for 2011 and 2012. Under the transitional rules (from 2016) nephrops was identified as the primary choke species in 2011, 2012 and 2013. As described above, cod 7BK would have been the primary choke species under full implementation of the landing obligation in 2013, but in 2011 the primary choke species would have been plaice 7A and in 2012 would have been plaice 7FG.

	Application of transitional rules (from 2016) to activity in 2013	Full implementation of landing obligation (from 2019) to activity in 2013
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	nephrops	cod 7BK
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	10,543	3,055
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	106	31
Estimate of uplift for primary choke species in 2013	25%	12%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	13,179	3,434
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	133	35
Would interspecies flexibility have been available for the choke species?	No	Yes

Table 7-3: The potential impact of transitional rules, uplift and interspecies flexibility for the Northern Ireland nephrops fleet in Area VII if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

7.2.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN AREA VII

There were no quota stocks for which no quota is allocated to POs in the North Sea.

However, the Northern Ireland nephrops fleet segment did not have initial quota allocation for sole 7FG but did record landings in 2013. This species was excluded from the choke analysis but has the potential to create difficulties for the nephrops fleet operating in this area.

7.3. WEST OF SCOTLAND (AREA VI)

Table 7-4 summarises the activity of the Northern Ireland nephrops fleet segment in West of Scotland (Area VI) in 2013. There were 99 vessels in total in the fleet segment (not all vessels may have been active in Area VI) and the segment spent 2,338 days in West of Scotland, which represents an average per vessel of 24 days. In total the segment landed 1,484 tonnes of demersal quota species from West of Scotland.

	Northern Ireland nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VI in 2013)*	99 vessels
Total number of fishing days fleet segment spent in sea area in 2013	2,338 days
Average number of days per vessel spent in sea area in 2013	24 days
Total volume of landings of demersal quota species by fleet segment from sea area	1,484 tonnes

Table 7-4: Northern Ireland nephrops trawl segment activity in West of Scotland in 2013

7.3.1. FIRST FIVE CHOKE SPECIES IN WEST OF SCOTLAND

The analysis below identifies that there were only four species that would have choked the activity of the Northern Ireland nephrops trawl segment in West of Scotland in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How these choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for these choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

Ling would have been the primary choke species in 2013 i.e. the initial quota allocation of ling would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for ling would have been fully used after a total of 1,410 fishing days in 2013, which compares to a total of 2,338 days the Northern Ireland nephrops trawl fleet actually fished in West of Scotland in 2013. The number of fishing days that would have been available for this choke species equates to an average of 14 days of fishing per vessel. The average number of days per vessel actually fished in West of Scotland in 2013 was 24 days (Table 7-5).

All four species that would have choked the Northern Ireland nephrops fleet in West of Scotland appear to have been unwanted catch as the initial quota allocation was not landed and calculated discard rates are between 50% and 96%. It is considered likely that quota for these species was leased out. Each of the four species represents less than 4% of the total landings of demersal quota species from West of Scotland by this fleet segment (Table 7-5).

First five choke species in West of Scotland	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from West of Scotland in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in West of Scotland
	Total days for fleet segment	Average days per vessel				
Ling	1,410	14	24	1.6%	50%	70%
Sole	1,681	17	1	0.0%	67%	52%
Hake	1,758	18	56	3.8%	9%	94%
Plaice	2,204	22	1	0.0%	4%	96%
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Table 7-5: First five choke species for the Northern Ireland nephrops trawl fleet in West of Scotland, based on initial quota allocation of all demersal quota species to the fleet segment in 2013..

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

7.3.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN WEST OF SCOTLAND

The choke analysis presented above for West of Scotland identifies that the initial quota allocation of ling would have been caught before any other species in 2013. Ling was therefore the primary choke species.

The proposed transitional rules (from 2016) mean that nephrops is the only species that could not be discarded by the fleet segment. As nephrops is not identified as a choke species there would therefore be no choke situation for the Northern Ireland nephrops trawl fleet in West of Scotland under the proposed transitional rules (from 2016) for the landing obligation.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, ling would have become the species that created a choke on the activity of the fleet in 2013 and fishing activity would have been reduced, as discussed above, to 1,410 days in total or 14 days on average per vessel.

Under full implementation of the landing obligation, it is not expected that uplift would have been available for ling in West of Scotland in 2013. Interspecies flexibility would also not have been available for ling (Table 7-6).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, only the temporary transitional rules could have alleviated the impact of the landing obligation for the Northern Ireland nephrops fleet segment in West of Scotland in 2013.

The impact of the landing obligation was also considered for 2011 and 2012. Under the transitional rules (from 2016) nephrops was identified as the primary choke species in 2011 and 2012 but, as presented above, not in 2013. As described above, ling would have been the primary choke species under full implementation of the landing obligation in 2013, but in 2011 and 2012 the primary choke species would have been hake.

	Application of transitional rules (from 2016) to activity in 2013	Full implementation of landing obligation (from 2019) to activity in 2013
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	none	ling
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up		1,410
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up		14
Estimate of uplift for primary choke species in 2013		Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift		1,410
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift		14
Would interspecies flexibility have been available for the choke species?		No

Table 7-6: The potential impact of transitional rules, uplift and interspecies flexibility for the Northern Ireland nephrops trawl fleet in West of Scotland if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

7.3.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN WEST OF SCOTLAND

Cod WS and whiting in Area VI had no quota allocated to POs and therefore had the potential to create difficulties for the nephrops fleet operating in this area. In 2013 the Northern Ireland nephrops trawl fleet recorded landings of both stocks. It is assumed that a solution will be found to prevent these stocks choking the fleet.

7.4. NORTH SEA (AREA IV)

Table 7-7 summarises the activity of the Northern Ireland nephrops trawl fleet segment in the North Sea in 2013. There were 99 vessels in total in the fleet segment (not all vessels may have been active in the North Sea) and the segment spent 767 days in the North Sea, which represents an average per vessel of 8 days. In total the segment landed 517 tonnes of demersal quota species from the North Sea.

	Northern Ireland nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in North Sea in 2013)*	99 vessels
Total number of fishing days the fleet segment spent in the sea area in 2013	767 days
Average number of days per vessel spent in sea area in 2013	8 days
Total volume of landings of demersal quota species by fleet segment from sea area	517 tonnes

Table 7-7: Northern Ireland nephrops fleet segment activity in the North Sea in 2013

7.4.1. FIRST FIVE CHOKE SPECIES IN THE NORTH SEA (AREA IV)

The analysis below identifies that only one species would have choked the activity of the Northern Ireland nephrops trawl segment in the North Sea. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How important the choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013, i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken to catch the initial quota allocation of a particular species.

The choke analysis shows that dabs would have been the primary and only choke species for the Northern Ireland nephrops trawl fleet in the North Sea in 2013 (Table 7-8). The initial quota allocation of dabs would have been caught by the fleet segment after a total of 253 fishing days in 2013. This compares to a total of 767 days the Northern Ireland nephrops trawl fleet actually fished in the North Sea in 2013. The number of fishing days that would have been available for this choke species equates to an average of three days of fishing per vessel. The average number of days per vessel actually fished in the North Sea in 2013 was eight days. Assuming that North Sea activity was not undertaken by all vessels in this segment, then for those that did fish in the North Sea, the days per vessel would have been higher.

Dabs represented a very small fraction (0.07 tonnes) of the total volume of landings of demersal quota species by the fleet segment in 2013. The fleet segment appears to have addressed the lack of initial quota allocation for dabs by fully discarding the species (Table 7-8).

First five choke species in North Sea	Estimated fishing days in 2013 before initial quota allocation for each species was used up		Total actual landings of each species from North Sea in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in North Sea
	Total days for fleet segment	Average days per vessel				
Dabs	253	3	0	0.0%	1%	100%
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Table 7-8: First five choke species for the Northern Ireland nephrops trawl fleet in North Sea (Area IV), based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Table Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

7.4.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN THE NORTH SEA

The choke analysis presented above for the North Sea identifies that the initial quota allocation of dabs would have been caught before any other species in 2013. Dabs was therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that dabs is not immediately subject to the landing obligation. Nephrops is the only species that could not be discarded

by the fleet segment under the transitional rules. Therefore, as nephrops was not a choke species for this fleet segment, there would be no choke species in 2013 (Table 7-9).

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, dabs would have been the first and only species to create a choke on the activity of the fleet in 2013.

Neither uplift nor interspecies flexibility would have been available for dabs in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules there was no difference as there would have been no choke species in any of the years. Dabs was identified as the primary choke species in 2013, as discussed above however, under full implementation of the landing obligation, hake would have been the primary choke species in 2011 and 2012.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	none	dabs
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for choke species was used up		253
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up		3
Estimate of uplift for choke species in 2013		Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift		253
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift		3
Would interspecies flexibility have been available for the choke species?		No

Table 7-9: The potential impact of transitional rules, uplift and interspecies flexibility for the Northern Ireland nephrops trawl fleet in North Sea if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

7.4.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN THE NORTH SEA (AREA IV)

There were no quota stocks for which no quota is allocated to POs in the North Sea.

8. WHITEFISH TRAWL AND SEINE CHOKE ANALYSIS FOR SCOTLAND

8.1. INTRODUCTION

The over 10m Scotland whitefish trawl/seine fleet segment consisted of 121 vessels in 2013 mostly fishing in North Sea (16,797days, 79% of total days) and Area VI, West of Scotland (3,231 days, 15% of total days). There was limited fishing by the fleet in Area VII (1,127 days, 5% of total days) for haddock, whiting, anglers and megrim.

Three choke analyses which consider the catching of demersal species by the Scotland whitefish trawl/seine fleet segment in 2013 are presented below. The first choke analysis is North Sea, the second is for West of Scotland and the third is for Area VII.

Each choke analysis includes:

- The first five species that would have been choke species for the Scotland whitefish trawl/seine fleet segment in each sea area in 2013. The species are identified based on a comparison of initial quota allocation to the fleet segment and catching activity (actual landings + estimated discards) in 2013. For each sea area, the analysis includes:
    - The number of days that the initial quota allocation for each of the first five choke species would have allowed the Scotland whitefish trawl/seine fleet segment to fish in 2013;
    - The importance of these first five choke species, in terms of volume, to the total landings of demersal quota species by the fleet segment in 2013; and
    - The extent to which discarding and quota trading appear to have been used to alleviate the lack of initial quota allocation for these five species in 2013.
- What impact a number of proposed rules for the demersal landing obligation might have had on the primary choke species, the first species that would have choked the fleet. The analysis considers:
    - Whether the primary choke species would have been the same species under the transitional rules (from 2016) and under full implementation (from 2019) of the landing obligation. The transitional rules for the whitefish trawl/seine fleet segment propose that cod, haddock, whiting and saithe are subject to the landing obligation from 2016 and that all other quota species are included from 2019;
    - The potential impact of quota uplift on fishing days, had 2012 advice from ICES on total catch been used to calculate quota uplift for 2013;
    - Whether it is likely that interspecies flexibility would have been available for the primary choke species in 2013; and
    - Whether the primary choke species would have been different if the analysis had been undertaken for 2011 or 2012, instead of 2013.
- Finally each choke analysis considers whether there were species where no quota was allocated to POs in 2013 in the sea areas where the fleet segment was active.

8.2. NORTH SEA (AREA IV)

Table 8-1 summarises the activity of the Scotland whitefish trawl/seine fleet segment in the North Sea in 2013. There were 121 vessels in total in the fleet segment (not all vessels may have been active in the North Sea) and the segment spent 16,797 days in the North Sea, which represents an average per vessel of 139 days. In total the segment landed 63,689 tonnes of demersal quota species from the North Sea.

	Scotland whitefish trawl/seine fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in North Sea in 2013)*	121 vessels
Total number of fishing days the fleet segment spent in the sea area in 2013	16,797 days
Average number of days per vessel spent in sea area in 2013	139 days
Total volume of landings of demersal quota species by fleet segment from sea area	63,689 tonnes

Table 8-1: Scotland whitefish trawl/seine fleet segment activity in the North Sea in 2013

8.2.1. FIRST FIVE CHOKE SPECIES IN THE NORTH SEA (AREA IV)

The analysis below identifies the first five species that would have choked the activity of the Scotland whitefish trawl/seine segment in the North Sea. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken to catch the initial quota allocation of a particular species.

The choke analysis shows that hake would have been the primary choke species for the Scotland whitefish trawl/seine fleet in the North Sea in 2013 (Table 8-2). The initial quota allocation of hake would have been caught by the fleet segment after a total of 4,073 fishing days in 2013. This compares to a total of 16,797 days the Scotland whitefish trawl/seine fleet actually fished in the North Sea in 2013. The number of fishing days that would have been available for this choke species equates to an average of 34 days of fishing per vessel. The average number of days per vessel actually fished in the North Sea in 2013 was 139 days.

Hake represented 1.4% of the total volume of landings of demersal species (with quotas) by the fleet segment in 2013. The fleet segment appears to have addressed the lack of initial quota allocation for hake through both discarding and securing additional quota. In 2013 hake had a discard rate of 36% and landings in 2013 equated to 263% of initial quota allocation (Table 8-2).

The initial quota allocation for the other four species on the list would also have had a substantial impact on the days available to the fleet segment but to a lesser extent than hake. The other four species and their potential impact on the total days of fishing available for the fleet segment in 2013 are saithe (6,776 days), cod (8,037 days), dabs (9,395 days) and skates and rays (10,100 days).

Saithe (second on the list) and cod (third on the list) represented 9.7% and 15.8% of landings from the North Sea respectively and therefore were the most important species on the list in terms of the volume of landings from the North Sea in 2013. Recorded discard rates suggest that 39% of the total catch of saithe was discarded and there is evidence that the lack of initial quota allocation was also covered by trading in additional quota, as landings equated to 151% of initial quota allocation. The discard rate for cod was lower (24%) and the proportion of additional quota that was traded in was similar to saithe as landings of cod equated to 159% of initial quota allocation (Table 8-2).

The lack of initial quota allocation to cover the total catch of dabs (fourth on the list) and skates and rays (fifth on the list) appears to have been caused by discarding as the initial quota allocation of both species was not fully landed. It is possible that quota for these species was leased out.

First five choke species in North Sea	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from North Sea in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in North Sea
	Total days for fleet segment	Average days per vessel				
Hake	4,073	34	912	1.4%	263%	36%
Saithe	6,776	56	6,147	9.7%	151%	39%
Cod	8,037	66	10,075	15.8%	159%	24%
Dabs	9,395	78	133	0.2%	67%	100%
Skates & Rays	10,100	83	289	0.5%	65%	61%

Table 8-2: First five choke species for the Scotland whitefish trawl/seine fleet in North Sea (Area IV), based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Table Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

8.2.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN THE NORTH SEA

The choke analysis presented above for the North Sea identifies that the initial quota allocation of hake would have been caught before any other species in 2013. Hake was therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that hake is not immediately subject to the landing obligation. Cod, haddock, whiting and saithe are the only species that could not be discarded by the fleet segment under the transitional rules. Therefore, in 2013, the first species that would have created a choke under the transitional rules would have been saithe. As shown above, it is estimated that the initial quota allocation of saithe would have enabled the fleet segment to fish for 6,776 days in 2013. This equates to 56 days of fishing per vessel compared to the average of 34 days per vessel for hake.

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, hake would have been the first species to create a choke on the activity of the fleet in 2013.

Of the two choke species identified under the landing obligation only hake (under the rules from 2019), could have had an uplift applied in 2013 according to ICES advice from 2012. The expected uplift would

have been 5% for hake. No uplift would have been expected for saithe in 2013 (under the transitional rules from 2016). If the landing obligation had been fully implemented in 2013 the uplift for hake would have increased the number of fishing days before hake choked the fleet segment from 4,073 days to 4,270 days. This would have had increased the days available to an average vessel by one day (Table 8-3).

Interspecies flexibility could have been available for both saithe and hake in 2013 (Table 8-3).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis all three, transitional rules, uplift (only for hake from 2019) and flexibility, could have been available to alleviate the impact of the landing obligation for the Scotland whitefish trawl/seine fleet segment in the North Sea in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and the same species created a choke in all three years under both transitional rules and full implementation of the landing obligation.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	cod, haddock, whiting, saithe	all demersal quota species
Choke species in 2013	saithe	hake
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for choke species was used up	6,776	4,073
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	56	34
Estimate of uplift for choke species in 2013	Uplift not available	5%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	6,776	4,270
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	56	35
Would interspecies flexibility have been available for the choke species?	Yes	Yes

Table 8-3: The potential impact of transitional rules, uplift and interspecies flexibility for the Scotland whitefish trawl/seine fleet in North Sea if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

8.2.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN THE NORTH SEA (AREA IV)

There were no quota stocks for which no quota is allocated to POs in the North Sea.

8.3. WEST OF SCOTLAND (AREA VI)

Table 8-4 summarises the activity of the Scotland whitefish trawl/seine fleet segment West of Scotland in 2013. There were 121 vessels in total in the fleet segment (not all vessels may have been active West of Scotland) and the segment spent 3,231 days West of Scotland, which represents an average per vessel of 27 days. In total the segment landed 11,802 tonnes of demersal quota species from West of Scotland.

	Scotland whitefish trawl/seine fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in West of Scotland in 2013)*	121 vessels
Total number of fishing days fleet segment spent in sea area in 2013	3,231 days
Average number of days per vessel spent in sea area in 2013	27 days
Total volume of landings of demersal quota species by fleet segment from sea area	11,802 tonnes

Table 8-4: Scotland whitefish trawl/seine fleet segment activity West of Scotland in 2013

8.3.1. FIRST FIVE CHOKE SPECIES IN WEST OF SCOTLAND

The analysis below identifies the first five species that would have choked the activity of the Scotland whitefish trawl/seine segment in West of Scotland in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

Saithe would have been the primary choke species in 2013 i.e. the initial quota allocation of saithe would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for saithe would have been fully used after a total of 1,727 fishing days in 2013, which compares to a total of 3,231 days the Scotland whitefish trawl/seine fleet actually fished West of Scotland in 2013. The number of fishing days that would have been available for this choke species equates to an average of 14 days of fishing per vessel. The average number of days per vessel actually fished West of Scotland in 2013 was 27 days (Table 8-5).

In 2013 the fleet segment appears to have addressed the lack of initial quota allocation for saithe by a combination of trading in quota, as landings equated to 138% of initial quota allocation, and discarding (26% of catch). Saithe represented a substantial proportion, 30%, of the total landings of demersal quota species by the fleet segment from West of Scotland in 2013 (Table 8-5).

Anglers (third on the list) and haddock 6A (fourth on the list) between them represent a further 42% of the landings from West of Scotland by the segment. The lack of initial quota allocation for anglers and haddock 6A, which could reduce the average days available per vessel to 19 days and 20 days respectively, was almost entirely addressed through trading in additional quota. The landings for anglers

equated to 139% of initial quota allocation and a 1% discard rate was recorded. The landings for haddock 6A equated to 124% of initial quota allocation and a discard rate of 7% was recorded.

The other two species on the list, megrim and hake, each represented about 4% of total landings and the discard rates are around 60%. The initial quota allocation for both species was not landed (Table 8-5). It is considered likely that quota for these species was leased out.

First five choke species in West of Scotland	Estimated fishing days in 2013 before initial quota allocation for each species was used up		Total actual landings of each species from West of Scotland in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in West of Scotland
	Total days for fleet segment	Average days per vessel				
Saithe	1,727	14	3,564	30.2%	138%	26%
Megrim	1,879	16	483	4.1%	69%	60%
Anglers	2,285	19	1,480	12.5%	139%	1%
Haddock 6A	2,412	20	3,532	29.9%	124%	7%
Hake	2,944	24	451	3.8%	49%	56%

Table 8-5: First five choke species for the Scotland whitefish trawl/seine fleet in West of Scotland, based on initial quota allocation of all demersal quota species to the fleet segment in 2013..

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

8.3.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN WEST OF SCOTLAND

The choke analysis presented above for West of Scotland identifies that the initial quota allocation of saithe would have been caught before any other species in 2013. Saithe was therefore the primary choke species.

Cod, haddock, whiting and saithe are the only species that could not be discarded by the fleet segment under the transitional rules and therefore saithe would have been the primary choke species under both transitional rules (from 2016) and full implementation of the landing obligation (from 2019).

In 2013 no quota uplift would have been applied to saithe although it is expected that interspecies flexibility would have been available (Table 8-6).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, i.e. transitional rules, uplift and interspecies flexibility, only interspecies flexibility could have alleviated the impact of the landing obligation for the Scotland whitefish trawl/seine fleet segment West of Scotland in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules (from 2016) saithe was identified as the primary choke species in 2011, 2012 and 2013. As described above, saithe would also have been the primary choke species under full implementation of the landing obligation in 2013, but in 2011 the primary choke species under full implementation of the landing obligation would have been megrim. In 2012, saithe would have remained the primary choke species under full implementation of the landing obligation.

	Application of transitional rules (from 2016) to activity in 2013	Full implementation of landing obligation (from 2019) to activity in 2013
Species covered by landing obligation	cod, haddock, whiting, saithe	all demersal quota species
Choke species in 2013	saithe	saithe
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	1,727	1,727
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	14	14
Estimate of uplift for primary choke species in 2013	Uplift not available	Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	1,727	1,727
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	14	14
Would interspecies flexibility have been available for the choke species?	Yes	Yes

Table 8-6: The potential impact of transitional rules, uplift and interspecies flexibility for the Scotland whitefish trawl/seine fleet in West of Scotland if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

8.3.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN WEST OF SCOTLAND

The Scotland whitefish trawl/seine fleet segment had landings of three quota species in 2013 that did not have quota allocated to POs. These were cod WS, cod 6B and whiting. It is assumed that a solution will be found to prevent these stocks choking the fleet.

8.4. AREA VII

Table 8-7 summarises the activity of the Scotland whitefish trawl/seine fleet segment in Area VII in 2013. There were 121 vessels in total in the fleet segment (not all vessels may have been active in Area VII) and the segment spent 1,127 days in Area VII, which represents an average per vessel of 9 days. In total the segment landed 802 tonnes of demersal quota species from Area VII.

	Scotland whitefish trawl/seine fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	121 vessels
Total number of fishing days fleet segment spent in sea area in 2013	1,127 days
Average number of days per vessel spent in sea area in 2013	9 days
Total volume of landings of demersal quota species by fleet segment from sea area	802 tonnes

Table 8-7: Scotland whitefish trawl/seine fleet segment activity in Area VII in 2013

The situation in Area VII is more complex than other sea areas as there are several stocks with quota determined by sub-area rather than Area VII as a whole. Therefore if one of these sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete fishing areas

not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

The total landings figure provided above does not include non-quota species such as gurnard, squid, seabass, seabream and turbot.

8.4.1. FIRST FIVE CHOKE SPECIES IN AREA VII

The analysis below identifies the first five species that would have choked the activity of the Scotland whitefish trawl/seine segment in Area VII in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

Cod 7BK would have been the primary choke species in 2013 i.e. the initial quota allocation of cod 7BK would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for cod 7BK would have been fully used after a total of 182 fishing days in 2013, which compares to a total of 1,127 days the Scotland whitefish trawl/seine fleet actually fished in Area VII in 2013. The number of fishing days that would have been available for this choke species equates to an average of two days of fishing per vessel. The average number of days per vessel actually fished in Area VII in 2013 was nine days (Table 8-8).

In 2013 the fleet segment appears to have largely addressed the lack of initial quota allocation for cod 7BK by trading in quota, as landings equated to 603% of initial quota allocation and there was evidence of limited discarding (3%). Cod 7BK represented 1.8%, of the total landings of demersal species (with quotas) by the fleet segment in 2013 (Table 8-8).

Megrim (fourth on the list) and whiting 7BK (fifth on the list) are the most important species, in terms of volume and of the five species listed, as combined they represented around 60% of total demersal quota landings from Area VII. Sole 7HJK (third on the list) represented only 0.1% of total landings. Plaice 7DE (second on the list) also represented less than 1% of landings. The lack of initial quota allocation for all four species was addressed by trading in quota but for two species discarding was also notable. The discard rate for plaice 7DE was the highest at 46% of catch, followed by whiting 7BK with a discard rate of 17% (Table 8-8).

First five choke species in Area VII	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from Area VII in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in Area VII
	Total days for fleet segment	Average days per vessel				
Cod 7BK	182	2	14	1.8%	603%	3%
Plaice 7DE	273	2	7	0.9%	225%	46%
Sole 7HJK	372	3	1	0.1%	298%	2%
Megrim	569	5	367	45.8%	191%	4%
Whiting 7BK	633	5	114	14.2%	148%	17%

Table 8-8: First five choke species for the Scotland whitefish trawl/seine fleet in Area VII, based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

8.4.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN AREA VII

The choke analysis presented above for Area VII identifies that the initial quota allocation of cod 7BK would have been caught before any other species in 2013. Cod 7BK was therefore the primary choke species.

Cod, haddock, whiting and saithe are the only species that could not be discarded by the fleet segment under the transitional rules and therefore cod 7BK would have been the primary choke species under both transitional rules (from 2016) and full implementation of the landing obligation (from 2019).

Had the landing obligation been implemented in 2013, cod 7BK could have had an uplift applied. This would have increased the number of fishing days available, under transitional rules, from 182 to 204 days (Table 8-9).

Interspecies flexibility would have been available for cod 7BK (Table 8-9).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, only transitional rules (from 2016) would have offered no benefit to the Scotland whitefish trawl/seine fleet segment in Area VII in 2013, while quota uplift and interspecies flexibility would have alleviated the situation to some extent.

The impact of the landing obligation was also considered for 2011 and 2012 and, under both the transitional rules (from 2016) and full implementation of the landing obligation (from 2019), cod 7BK was identified as the primary choke species in 2011, 2012 and 2013.

	Application of transitional rules (from 2016) to activity in 2013	Full implementation of landing obligation (from 2019) to activity in 2013
Species covered by landing obligation	cod, haddock, whiting, saithe	all demersal quota species
Choke species in 2013	cod 7BK	cod 7BK
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	182	182
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	2	2
Estimate of uplift for primary choke species in 2013	12%	12%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	204	204
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	2	2
Would interspecies flexibility have been available for the choke species?	Yes	Yes

Table 8-9: The potential impact of transitional rules, uplift and interspecies flexibility for the Scotland whitefish trawl/seine fleet in Area VII if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

8.4.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN AREA VII

There were no quota stocks for which no quota is allocated to POs in Area VII.

However, the Scotland whitefish trawl/seine fleet segment did not have initial quota allocation for sole 7D but did record landings in 2013. This species was excluded from the choke analysis but has the potential to create difficulties for the whitefish trawl/seine fleet operating in this area.

9. NEPHROPS TRAWL CHOKE ANALYSIS FOR SCOTLAND

9.1. INTRODUCTION

The over 10m Scotland nephrops trawl fleet segment consisted of 208 vessels in 2013 fishing in Area VI, West of Scotland (20,495 days, 61% of total days) and Area IV, North Sea (12,261 days, 37% of total days). There was some activity in Area VII (701 days, 2% of total days).

Three choke analyses which consider the catching of demersal species by the Scotland nephrops fleet segment in 2013 are presented below. The first choke analysis is for West of Scotland, the second is for the North Sea and the third is for Area VII.

Each choke analysis includes:

- The first five species that would have been choke species for the Scotland nephrops fleet segment in each sea area in 2013. The species are identified based on a comparison of initial quota allocation to the fleet segment and catching activity (actual landings + estimated discards) in 2013. For each sea area, the analysis includes:
    - The number of days that the initial quota allocation for each of the first five choke species would have allowed the Scotland nephrops fleet segment to fish in 2013;
    - The importance of these first five choke species, in terms of volume, to the total landings of demersal quota species by the fleet segment in 2013; and
    - The extent to which discarding and quota trading appear to have been used to alleviate the lack of initial quota allocation for these five species in 2013.
- What impact a number of proposed rules for the demersal landing obligation might have had on the primary choke species, the first species that would have choked the fleet. The analysis considers:
    - Whether the primary choke species would have been the same species under the transitional rules (from 2016) and under full implementation (from 2019) of the landing obligation. The transitional rules for the nephrops fleet segment propose that only nephrops is subject to the landing obligation from 2016 and that all other demersal quota species are included from 2019;
    - The potential impact of quota uplift on fishing days, had 2012 advice from ICES on total catch been used to calculate quota uplift for 2013;
    - Whether it is likely that interspecies flexibility would have been have been available for the primary choke species in 2013; and
    - Whether the primary choke species would have been different if the analysis had been undertaken for 2011 or 2012, instead of 2013.
- Finally each choke analysis considers whether there were species where no quota was allocated to POs in 2013 in the sea areas where the fleet segment was active.

9.2. WEST OF SCOTLAND (AREA VI)

Table 9-1 summarises the activity of the Scotland nephrops fleet segment in West of Scotland (Area VI) in 2013. There were 208 vessels in total in the fleet segment (not all vessels may have been active in Area VI) and the segment spent 20,495 days in West of Scotland, which represents an average per vessel of 99 days. In total the segment landed 9,448 tonnes of demersal quota species from West of Scotland.

	Scotland nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VI in 2013)*	208 vessels
Total number of fishing days fleet segment spent in sea area in 2013	20,495 days
Average number of days per vessel spent in sea area in 2013	99 days
Total volume of landings of demersal quota species by fleet segment from sea area	9,448 tonnes

Table 9-1: Scotland nephrops trawl segment activity in West of Scotland in 2013

9.2.1. FIRST FIVE CHOKE SPECIES IN WEST OF SCOTLAND

The analysis below identifies the first five species that would have choked the activity of the Scotland nephrops trawl segment in West of Scotland in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

Plaice would have been the primary choke species in 2013 i.e. the initial quota allocation of plaice would have been caught by the fleet segment before any other quota species was fully caught. The initial quota allocation for plaice would have been fully used after a total of 8,069 fishing days in 2013, which compares to a total of 20,495 days the Scotland nephrops trawl fleet actually fished in West of Scotland in 2013. The number of fishing days that would have been available for this choke species equates to an average of 39 days of fishing per vessel. The average number of days per vessel actually fished in West of Scotland in 2013 was 99 days (Table 9-2: First five choke species for the Scotland nephrops trawl fleet in West of Scotland, based on initial quota allocation of all demersal quota species to the fleet segment in 2013...

All five of the species on the list appear to be largely unwanted catch as the segment does not land the full initial quota allocation for any of the five species and all five species have very high discard rates recorded, from 66% for megrim to 96% for plaice (Table 9-2). However, it is considered likely that the fleet segment leased out some of its initial quota allocation for these species.

First five choke species in West of Scotland	Estimated fishing days in 2013 before initial quota allocation for each species was used		Total actual landings of each species from West of Scotland in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in West of Scotland
	Total days for fleet segment	Average days per vessel				
Plaice	8,069	39	8	0.1%	10%	96%
Hake	10,413	50	34	0.4%	13%	94%
Saithe	10,613	51	57	0.6%	20%	90%
Ling	12,591	61	27	0.3%	49%	70%
Megrim	17,758	85	43	0.5%	40%	66%

Table 9-2: First five choke species for the Scotland nephrops trawl fleet in West of Scotland, based on initial quota allocation of all demersal quota species to the fleet segment in 2013..

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

9.2.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN WEST OF SCOTLAND

The choke analysis presented above for West of Scotland identifies that the initial quota allocation of plaice would have been caught before any other species in 2013. Plaice was therefore the primary choke species.

The proposed transitional rules (from 2016) mean that nephrops is the only species that could not be discarded by the fleet segment. Although nephrops is not identified as one of the first five choke species, the choke analysis does show that the initial quota allocation for nephrops would have been used up in fewer days than the fleet segment actually fished in 2013. Although the fleet segment did not land its initial quota allocation (95% was landed), the calculated discard rate (5.7%) means that total catch did exceed initial quota allocation. Therefore the total number of days before nephrops would have created a choke was 20,284 compared to the 20,495 days actually fished. Compared to other fleet segments, this would have been a relatively small reduction in activity and it is estimated that it would have reduced the average fishing days per vessel by one day, from 99 days to 98 days (Table 9-3).

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, plaice would have become the species that created a choke on the activity of the fleet in 2013 and fishing activity would have been reduced, as discussed above, to 8,069 days in total or 39 days on average per vessel.

Quota uplift would have been available for nephrops (23%) and therefore it would not have created a choke on the activity of the fleet under the transitional rules of the landing obligation (from 2016).

Under full implementation of the landing obligation, neither uplift nor interspecies flexibility would have been available for plaice in West of Scotland in 2013 (Table 9-3).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, only the temporary transitional rules – when only nephrops is subject to the landing obligation – could have alleviated the impact of the landing obligation for the Scotland nephrops fleet segment in West of Scotland in 2013.

The impact of the landing obligation was also considered for 2011 and 2012. Under the transitional rules (from 2016) nephrops was identified as the primary choke species in 2011, 2012 and 2013. As described above, plaice would have been the primary choke species under full implementation of the landing obligation in 2013, it would also have been plaice in 2012 but in 2011 the primary choke species would have been hake.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	nephrops	plaice
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	20,284	8,069
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	98	39
Estimate of uplift for primary choke species in 2013	23%	Uplift not available
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	24,949	8,069
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	120	39
Would interspecies flexibility have been available for the choke species?	No	No

Table 9-3: The potential impact of transitional rules, uplift and interspecies flexibility for the Scotland nephrops trawl fleet in West of Scotland if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

9.2.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN WEST OF SCOTLAND

Cod WS and whiting did not have quota allocated to POs in West of Scotland. Therefore these species have the potential to create difficulties for the nephrops fleet operating in this area. In 2013 the Scotland nephrops trawl fleet recorded landings of both stocks. It is assumed that a solution will be found to prevent these species becoming a choke for this fleet segment.

9.3. NORTH SEA (AREA IV)

Table 9-4 summarises the activity of the Scotland nephrops trawl fleet segment in the North Sea in 2013. There were 208 vessels in total in the fleet segment (not all vessels may have been active in the North Sea) and the segment spent 12,261 days in the North Sea, which represents an average per vessel of 59 days. In total the segment landed 11,524 tonnes of demersal quota species from the North Sea.

	Scotland nephrops trawl fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in North Sea in 2013)*	208
Total number of fishing days the fleet segment spent in the sea area in 2013	12,261
Average number of days per vessel spent in sea area in 2013	59
Total volume of landings of demersal quota species by fleet segment from sea area	11,524 tonnes

Table 9-4: Scotland nephrops trawl fleet segment activity in the North Sea in 2013

9.3.1. FIRST FIVE CHOKE SPECIES IN THE NORTH SEA (AREA IV)

The analysis below identifies the first five species that would have choked the activity of the Scotland nephrops trawl segment in the North Sea. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken to catch the initial quota allocation of a particular species.

The choke analysis shows that hake would have been the primary choke species for the Scotland nephrops trawl fleet in the North Sea in 2013 (Table 9-5). The initial quota allocation of hake would have been caught by the fleet segment after a total of 263 fishing days in 2013, which compares to a total of 12,261 days the Scotland nephrops trawl fleet actually fished in the North Sea in 2013. The number of fishing days that would have been available for this choke species equates to an average of one day per vessel. The average number of days per vessel actually fished in the North Sea in 2013 was 59 days.

The fleet segment appears to have addressed the lack of initial quota allocation for hake through largely discarding but the segment did secure additional quota. In 2013 hake had a discard rate of 94% and landings in 2013 equated to 275% of initial quota allocation (Table 9-5).

All five of the species on the list appear to be largely unwanted catch for the nephrops trawl segment in Scotland as all five species have very high discard rates recorded, from 73% for cod to 100% for dabs and tusk (Table 9-5). The only species on the first five list for which the initial quota allocation is landed and additional quota is traded in is hake.

The first three species on the list, hake, dabs and tusk each represent less than 1% of total landings of demersal quota species. However, the choke created by hake, dabs and tusk would have reduced the average number of days each vessel in the fleet could have fished in the North Sea from 59 days in 2013 to one, four and 11 days respectively.

Cod (fourth on the list) and plaice (fifth on the list) represent higher proportions of the total landings of demersal quota species, 3.3% and 2.2% respectively. These species also have the lowest discard rates of the five species on the list and the initial quota allocation is not landed. However, it is considered likely that the fleet segment leased out some of its initial quota allocation for these species.

First five choke species in North Sea	Estimated fishing days in 2013 before initial quota allocation for each species is used up		Total actual landings of each species from North Sea in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in North Sea
	Total days for fleet segment	Average days per vessel				
Hake	263	1	95	0.8%	275%	94%
Dabs	804	4	2	0.0%	7%	100%
Tusk	2,216	11	0	0.0%	31%	100%
Cod	5,162	25	382	3.3%	64%	73%
Plaice	6,580	32	255	2.2%	45%	76%

Table 9-5: First five choke species for the Scotland nephrops trawl fleet in North Sea (Area IV), based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Table Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

9.3.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN THE NORTH SEA

The choke analysis presented above for the North Sea identifies that the initial quota allocation of hake would have been caught before any other species in 2013. Hake is therefore the primary choke species.

However, the proposed transitional rules (from 2016) for the landing obligation mean that hake is not immediately subject to the landing obligation. Nephrops is the only species that could not be discarded by the fleet segment under transitional rules. However in 2013, only 63% of the initial quota allocation of nephrops to the fleet segment in 2013 was landed, and with a discard rate of 5.7%, the total catch of nephrops would not have created a choke on fishing activity for this fleet segment in 2013 (Table 9-6).

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, hake would have been the first species to create a choke on the activity of the fleet in 2013.

Hake could have had an uplift of 5% applied in 2013 according to ICES advice from 2012. If the landing obligation had been fully implemented in 2013 the uplift for hake would have increased the number of fishing days before hake choked the fleet segment from 263 days to 276 days. This would have had very little impact on the days available to an average vessel (Table 9-6).

It is likely that interspecies flexibility could have been available for hake (Table 9-6).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, transitional rules, uplift and flexibility, all three could have been available to alleviate the impact of the landing obligation for the Scotland nephrops trawl fleet segment in the North Sea in 2013. However, it is the temporary transitional rules that would have had by far the greatest impact.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules there would have been no choke species in 2011, 2012 and 2013. Under full implementation of the landing obligation (from 2019) hake was identified as the primary choke species in 2013, as discussed above, but dabs would have been the primary choke species (from 2019) in 2011 and 2012.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	none	hake
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for choke species was used up		263
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up		1
Estimate of uplift for choke species in 2013		5%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift		276
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift		1
Would interspecies flexibility have been available for the choke species?		Yes

Table 9-6: The potential impact of transitional rules, uplift and interspecies flexibility for the Scotland nephrops trawl fleet in North Sea if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

9.3.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN THE NORTH SEA (AREA IV)

There were no quota stocks for which no quota is allocated to POs in the North Sea.

9.4. AREA VII

Table 9-7 summarises the activity of the Scotland nephrops trawl fleet segment in Area VII in 2013. There were 208 vessels in total in the fleet segment (not all vessels were been active in Area VII) and the segment spent 701 days in Area VII, which represents an average per vessel of three days. In total, vessels in the segment landed 451 tonnes of demersal quota species from Area VII.

It is clear that Area VII fishing was carried out by a small proportion of vessels in this segment, however figures are still presented as average for the whole fleet segment, to remain consistent in approach with other fleet segments.

	Scotland nephrops fleet
Total number of vessels in fleet segment in 2013 *(not all vessels in the fleet segment may have been active in Area VII in 2013)*	208 vessels
Total number of fishing days fleet segment spent in sea area in 2013	701 days
Average number of days per vessel spent in sea area in 2013	3 days
Total volume of landings of demersal quota species by fleet segment from sea area	451 tonnes

Table 9-7: Scotland nephrops trawl fleet segment activity in Area VII in 2013

The situation in Area VII is more complex than other sea areas as there are several stocks with quota determined by sub-area rather than Area VII as a whole. Therefore if one of these sub-area species is identified as the primary choke species the fleet segment could continue to fish in discrete fishing areas not affected by the choke species. However, for the purpose of the choke analysis, Area VII has been treated as a single area.

It should also be noted that the target species for this fleet segment in Area VII may include non-quota species. The total landings figure provided above does not include non-quota species.

9.4.1. FIRST FIVE CHOKE SPECIES IN AREA VII

The analysis below identifies the first five species that would have choked the activity of the Scotland nephrops trawl segment in Area VII in 2013. The identification of choke species compares the initial quota allocation to the fleet segment in 2013 to the catching activity of the segment (actual landings + estimated discards). The result is the five species for which the segment would have run out of quota for first, assuming no discarding or trading in of quota. The analysis shows:

- How the first five choke species compare to each other in terms of the scale of the choke situation they would have each created;
- How important each choke species was to the fleet segment in terms of volume; and
- How catch above initial quota allocation was addressed in 2013 for the first five choke species i.e. by trading in additional quota or by discarding.

The figures for estimated total catch and actual days at sea in 2013 were used to calculate an average catch rate per day. The average catch rate per day was used to estimate how many days it would have taken the fleet segment to catch the initial quota allocation of a particular species.

The activity of the Scotland nephrops fleet segment in Area VII in 2013 would mean that the initial quota allocation for cod 7BK would have been used up first and therefore cod 7BK was the primary choke species. The table below shows that the fleet landed the equivalent of 2,248% of its initial quota allocation of cod 7BK in 2013 and there were zero discards recorded. The species represented 4% of the total landings of demersal quota species by the fleet segment from Area VII.

Sole 7HJK (second on the list) and whiting 7A (third on the list) represented 0.07% and 0.3% of total landings respectively. However, it appears that the lack of initial quota allocation for sole was fully addressed by trading in additional quota as no discards are recorded and landings represented 690% of initial quota allocation. The lack of initial quota allocation for whiting was addressed in 2013 through a combination of discards (55%) and trading in additional quota (141%).

The other two species on the list, haddock 7BK and whiting 7BK, represented a higher proportion of total landings, 8.6% and 2.8% respectively, compared to sole 7HJK and whiting 7A, however the lack of initial quota allocation appears to have been addressed differently. In 2013 the fleet segment landed 182% of

its initial quota allocation for haddock 7BK and no discards were recorded. In contrast only 58% of the initial quota allocation of whiting 7BK was landed and 55% of total catch was discarded (Table 9-8). However, it is possible that the fleet segment leased out some of its initial quota allocation for whiting 7BK.

First five choke species in Area VII	Estimated fishing days in 2013 before initial quota allocation for each species was used up		Total actual landings of each species from Area VII in 2013 (tonnes)	Actual landing volume of each species as % of total volume of demersal quota species landed in 2013	Actual landing volume of each species as a % of initial quota allocation for that species in 2013	2013 discard rate for each species in Area VII
	Total days for fleet segment	Average days per vessel				
Cod 7BK	31	0	18	4.0%	2,248%	0%
Sole 7HJK	102	0	0	0.07%	690%	0%
Whiting 7A	224	1	1	0.3%	141%	55%
Haddock 7BK	386	2	39	8.6%	182%	0%
Whiting 7BK	545	3	13	2.8%	58%	55%

Table 9-8: First five choke species for the Scotland nephrops fleet in Area VII, based on initial quota allocation of all demersal quota species to the fleet segment in 2013.

Note: Please refer to Chapter 3 and Appendix A to see how initial quota allocation and discard rates have been calculated.

9.4.2. IMPACT OF THE PRIMARY CHOKE SPECIES UNDER THE LANDING OBLIGATION IN AREA VII

The choke analysis presented above for Area VII identifies that the initial quota allocation of cod 7BK would have been caught before any other species in 2013. Cod 7BK was therefore the primary choke species.

The proposed transitional rules for the landing obligation (from 2016) mean that nephrops is the only species that could not be discarded by the fleet segment. Although nephrops is not identified as one of the first five choke species, the choke analysis does show that the initial quota allocation for nephrops would have been used up in fewer days than the fleet segment fished for in Area VII in 2013. In 2013 the Scotland nephrops trawl fleet segment landed 114% of its initial quota allocation for nephrops in Area VII and had a recorded discard rate of 2.8%. Therefore the total number of days before the initial quota allocation for nephrops would have created a choke was 598 days compared to the 701 days actually fished (Table 9-3).

Full implementation of the landing obligation, as proposed from 2019, means that all demersal quota species become subject to the landing obligation and cannot be discarded. Therefore, under full implementation of the landing obligation, cod 7BK would have become the species that created a choke on the activity of the fleet in 2013 and fishing activity would have been reduced, as discussed above, to 31 days in total or 0.15 days on average per vessel (Table 9-9).

It is expected that uplift would have been available for nephrops (25%) which would mean that it would have no longer represented a choke on the activity of the fleet under the transitional rules of the landing obligation (from 2016) (Table 9-9).

Under full implementation of the landing obligation (from 2019), and based on ICES advice from 2012, an uplift of 12% would have been available for cod 7BK to improve the choke situation in 2013. The uplift would have increased the total number of days available to the fleet from 31 days to 35 days. Thirty five

days in total is equivalent to an average per vessel of 0.17 days, although not all Scotland nephrops trawl vessels may have been active in Area VII (Table 9-9).

It is expected that interspecies flexibility would have been available for cod 7BK but not for nephrops (Table 9-9).

Therefore of the three potential sources of mitigation for the landing obligation considered in the choke analysis, all three i.e. transitional rules, uplift, and interspecies flexibility (for cod 7BK) could have alleviated the impact of the landing obligation for the Scotland nephrops trawl fleet segment in Area VII in 2013.

The impact of the landing obligation was also considered for 2011 and 2012 and under the transitional rules (from 2016) nephrops was identified as the primary choke species in 2012 and 2013. Nephrops was not identified as a choke species in 2011. As described above, cod 7BK would have been the primary choke species under full implementation of the landing obligation in 2013, but in 2011 plaice 7FG would have been the choke species and haddock 7BK would have been the primary choke species in 2012.

	Application of transitional rules (from 2016) to activity in 2013	**Full implementation of landing obligation (from 2019) to activity in 2013**
Species covered by landing obligation	nephrops	all demersal quota species
Choke species in 2013	nephrops	cod 7BK
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up	598	31
Estimated average number of fishing days *per vessel* until quota allocation for choke species was used up	3	0
Estimate of uplift for primary choke species in 2013	25%	12%
Estimated number of fishing days for the *whole fleet segment* until initial quota allocation for the choke species was used up, including the benefit of uplift	747	35
Estimated average number of fishing days *per vessel* until the initial quota allocation for the choke species was used up, including the benefit of uplift	4	0
Would interspecies flexibility have been available for the choke species?	No	Yes

Table 9-9: The potential impact of transitional rules, uplift and interspecies flexibility for the Scotland nephrops fleet in Area VII if the landing obligation had applied to activity in 2013

Note: This is a retrospective analysis and it was not considered possible to estimate how the implementation of the landing obligation might have changed the trading patterns for quota or catching activity of the fleet.

9.4.3. STOCKS FOR WHICH NO QUOTA IS ALLOCATED IN AREA VII

There were no quota stocks for which no quota is allocated to POs in Area VII.

10. UK QUOTA BALANCE

Chapter 10 presents analysis that considers the degree to which quota in one of the home nations' fleet segments might, in 2013, have resolved the estimated choke situation in another home nation fleet segment. Stocks that are primary choke species for fleet segments in their main sea area are reviewed including:

- North Sea haddock, saithe and hake (shown in blue in Figure 10-1);
- West of Scotland plaice and saithe (shown in yellow in Figure 10-1); and
- Area 7BK cod and Area 7HJK plaice (shown in green in Figure 10-1).

The analyses presented in the following graphs (Figure 10-1) show that for most of the primary choke species exchanges of quota between home nations could not have alleviated the choke. This is because across all of the fleets, estimated total 2013 catch exceeded 2013 total initial quota allocation. Where the fleet segment figures do not add up to the total figure presented this is due to rounding.

Estimated total catch, as in the rest of the choke analysis, is dependent on recorded discard rates. International trade is not considered in this analysis and quota holdings in Wales and in the whitefish fleet segment in Northern Ireland are not taken into account.

10.1. NORTH SEA

The whitefish trawl/seine fleet would have required an additional 8,805 tonnes of haddock quota to cover the levels of catch estimated for 2013. The nephrops fleet is estimated to have had quota excess of 748 tonnes. However this left a quota shortage of 8,057 tonnes across the UK.

The whitefish trawl/seine fleet would have required an additional 9,585 tonnes of saithe quota to cover the levels of catch estimated for 2013. The nephrops fleet is estimated to have required an additional 97 tonnes and therefore there was an estimated quota shortage of 9,680 tonnes.

Additional North Sea hake quota would have been required for both the whitefish trawl/seine fleet (1,389 tonnes) and the nephrops fleet (1,650 tonnes) to cover estimated catch. The estimated quota shortage for 2013 was 3,040 tonnes across the UK.

10.2. WEST OF SCOTLAND

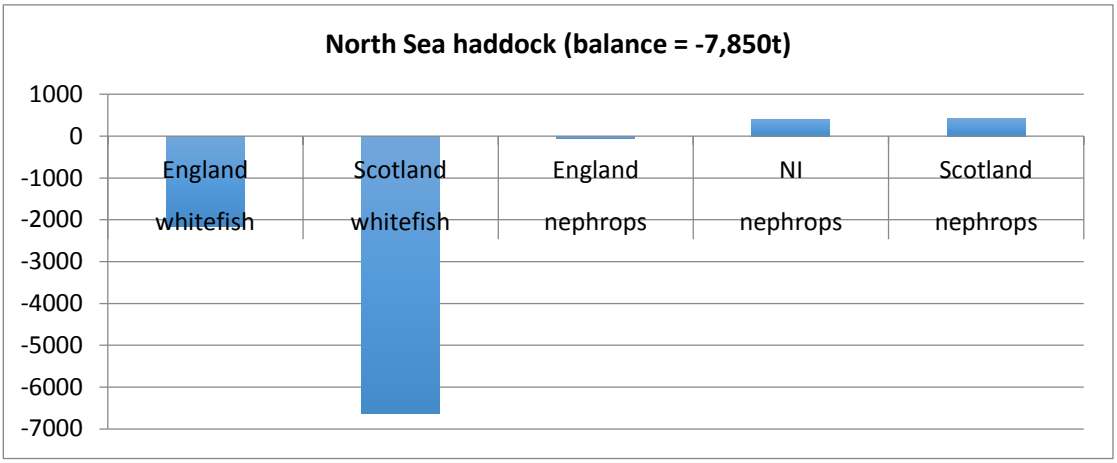
The only stock reviewed which had a positive balance of quota to catch is West of Scotland plaice in 2013. The nephrops fleet in the UK is estimated to have required 115 tonnes and the whitefish trawl/seine fleet is estimated to have had an excess of 218 tonnes.

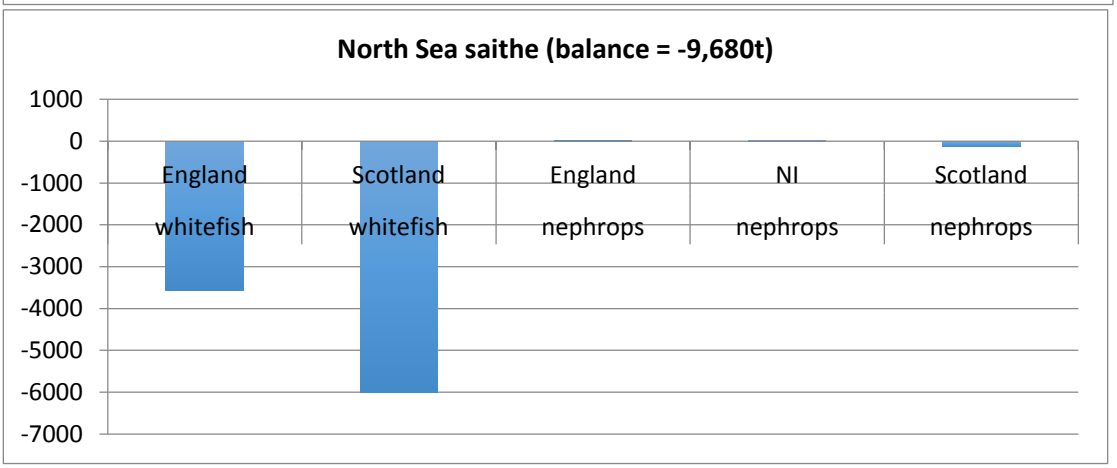
The choke analysis estimates that the UK whitefish trawl/seine fleet required an additional 1,731 tonnes of West of Scotland saithe quota to match catch volumes in 2013. The nephrops fleet would also have required additional quota to cover catch volume (241 tonnes). The graph demonstrates an overall shortage of 1,972 tonnes of West of Scotland saithe quota.

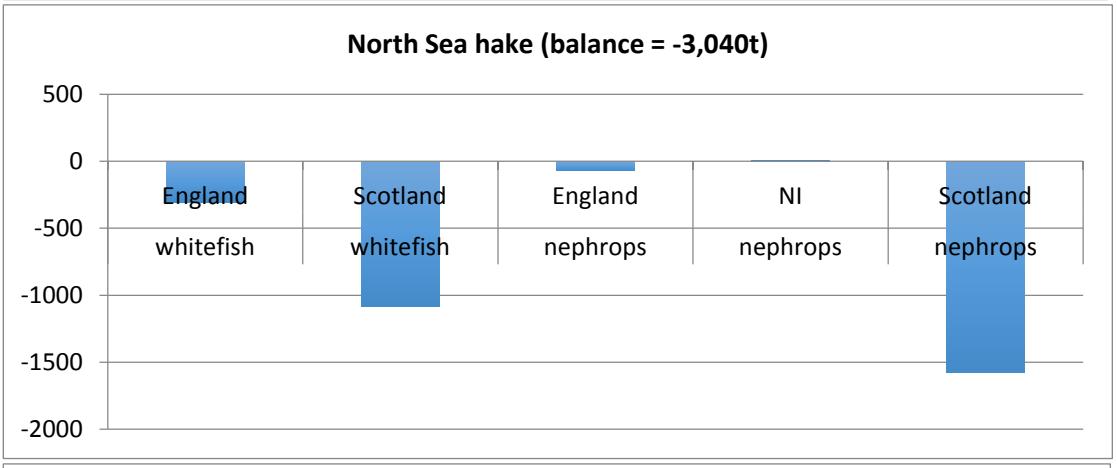
10.3. AREA VII

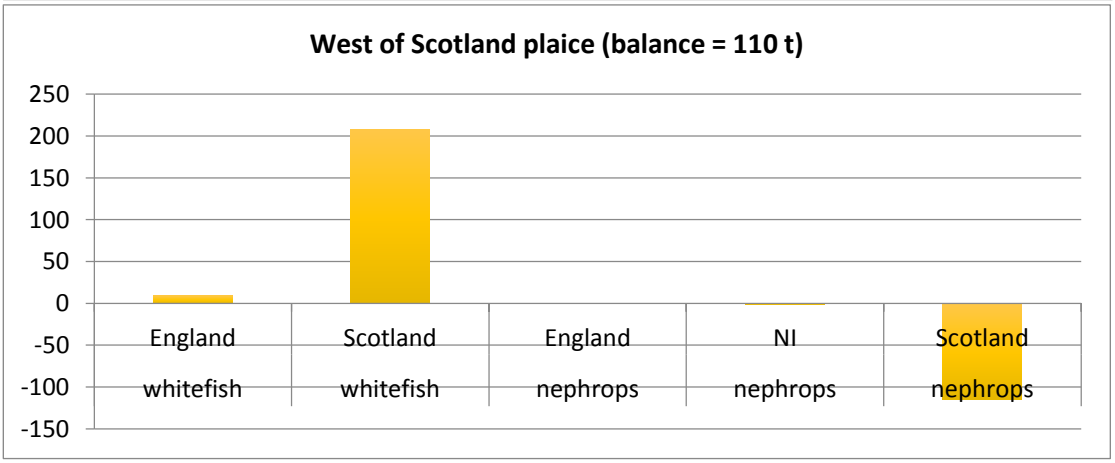
For cod in Area 7BK, the whitefish trawl/seine fleet, the nephrops fleet and the beam trawl fleet required additional cod 7BK quota from outside of the UK to cover estimated catch volumes. The additional requirement in 2013 is estimated to have been 267 tonnes of quota (Figure 10-1).

The choke analysis estimates that the UK whitefish trawl/seine fleet had an excess of two tonnes of Plaice 7HJK but the beam trawl fleet had a shortage of 29 tonnes. This left an overall shortage of 28 tonnes.


North Sea haddock (balance = -7,850t)
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
England whitefish
Scotland whitefish
England nephrops
NI nephrops
Scotland nephrops


North Sea saithe (balance = -9,680t)
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
England whitefish
Scotland whitefish
England nephrops
NI nephrops
Scotland nephrops


North Sea hake (balance = -3,040t)
500
0
-500
-1000
-1500
-2000
England whitefish
Scotland whitefish
England nephrops
NI nephrops
Scotland nephrops


West of Scotland plaice (balance = 110 t)
250
200
150
100
50
0
-50
-100
-150
England whitefish
Scotland whitefish
England nephrops
NI nephrops
Scotland nephrops

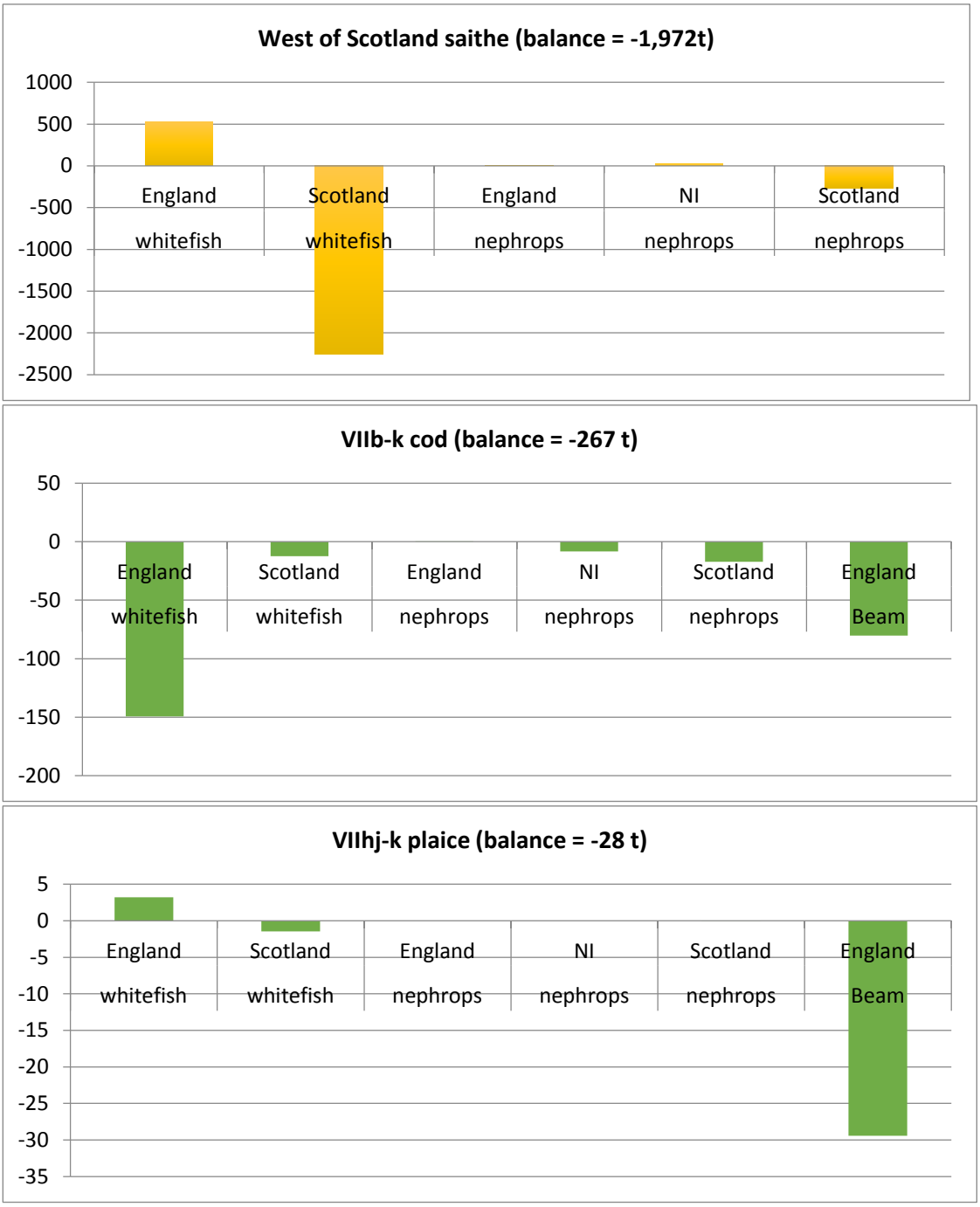


Figure 100-1: Balance between initial quota allocation and total catch for key choke species, 2013

11. PRODUCER ORGANISATION CHOKE ANALYSIS FEEDBACK

The choke analyses presented in this report were undertaken for all over 10m vessels in the UK and each vessel was grouped by its country of registration i.e. England, Northern Ireland and Scotland.

Choke analyses were also produced for fleet segments in each Producer Organisation (PO). Some of these groups include vessels from more than one of the home nations. Within each PO vessels were further defined by their gear type, for example whitefish trawl/seine, gill netter, nephrops trawl. This process created 76 segments and choke analyses were undertaken for the 29 segments which had five or more vessels. Each PO that had a group with five or more vessels in it was contacted to discuss the results.

More fleet segments were included in the individual PO consultation exercise than in the home nation choke analysis. Six different gear types were covered by the consultations:

- Beam Trawlers;
- Whitefish Trawlers and Seine Netters;
- Nephrops Trawlers;
- Nephrops Pots and Traps;
- Longliners; and
- Gill netters.

In total, 14 consultations with POs were undertaken. Most were undertaken face to face and the choke analyses specific to each PO was discussed in detail. The consultation included discussion of the data contained in the analysis and potential tactics and strategies that could be used to improve the presented choke position for each fleet segment. The majority of PO consultations were undertaken in November and December 2014 and therefore the comments reflect views held at that time.

The remainder of Chapter 11 is split into two sections that reflect the consultation structure. The first section presents feedback received on the data and the PO choke analysis. The second section presents feedback from POs on the measures that might alleviate the baseline choke position presented to POs. A third section highlights issues not directly related to activity at sea that were also raised by POs. The chapter concludes with a summary.

11.1. FEEDBACK ON CHOKE ANALYSES

The majority of consultees already held their own views on which species are likely to cause problems for their own vessels. Nevertheless the consultees were interested in the data produced in the choke analyses, the assumptions applied and the stocks identified as potential choke species.

The consultees were all asked if they considered that the choke analyses for each segment in their PO presented:

- The choke species that they expected;
- The level of impact that they expected; and
- Discard rates they considered to be reasonable.

Consultees were also asked to comment on whether seasonality in a fishery might have affected the results and whether there are other issues that might have affected the accuracy of the results for 2011, 2012 and 2013. The responses received are summarised below:

- 10 out of 14 consultees stated that the choke species identified for each sea area seemed correct or as expected;
- With regards to the level of impact there was more uncertainty. Seven of the 14 thought the estimated impact looked about right, three did not know and four thought that the level of impact shown was too low. Five of the POs consulted said the impact was too low because one or more key discard rates was believed to be too low.
- With regards to discard rates, three consultees thought that the discard rates seemed right, six consultees believed that one or more discard rates for key species was too low and another five did not know if the discard rates applied reflected reality.

Seasonality was most commonly identified as an issue for the Nephrops Trawl segments, with high volumes of small prawns caught in summer and higher volumes of finfish caught in autumn. One representative of the whitefish fleet also said seasonality could be an issue for whiting and saithe.

Discussions around the data were often very detailed but three common themes emerged. These are:

- Uncertainty around the accuracy of discard rates and therefore the accuracy of estimated total catch and catch rates.
- Differences in the relative scale of impact expected by POs. The most important factor influencing impact expectations appeared to be the target catch of a fleet segment. A second factor was the main sea area of the fleet and challenges that are specific to the area.
- The potential impact of stocks with very low quotas that are not targeted by the fleet, but can be caught.

Each of these three themes is explored in more detail below.

11.1.1. DISCARD RATES

The data issue that generated the greatest amount of discussion in the choke analysis was estimated discard rates. Initial responses ranged from POs not knowing if the rates were representative, POs agreeing the discard rates '*looked about right*', and POs believing the discard rates did not reflect reality.

The discussions on discard rates highlighted the limited knowledge that exists about catch volumes compared to landed volumes. When comments on the accuracy of the recorded discard rates were made by a PO this was generally informed by anecdotal information from skippers. In all cases when the discard rate was believed to be inaccurate, we were told that the discard rate is too low. No one suggested that discard rates might be too high. Stocks thought by at least one consultee to have higher discard rates in reality than shown in our estimates included, among others: West of Scotland and North Sea nephrops, North Sea cod, North Sea hake, North Sea saithe and anglers.

Comments were also made that existing regulations affect discard rates over time. Obviously quota is one influence, but catch composition rules, for example rules on by-catch on the West of Scotland, also affect the pattern and extent of discarding.

The discard rate used in the choke analysis is critical to the calculation of choke species and, as a result, in the calculation of the economic impact. If the discard rates used do not always reflect reality, and feedback suggests that there is reasonable chance that some do not, the species which choke the different fleet segments and the speed with which the fleet is choked is likely to vary from the choke analyses presented both to the POs and in the national analyses in this report. The feedback from consultees indicates that if the 2013 choke position is different from the one presented then the true position, based on initial quota allocation, could be worse.

Without more robust information on discard rates and therefore on total catch it is not possible at this time to estimate the scale of the potential difference between the choke analysis and what will actually happen under the rules that will be implemented in 2016 and 2019. Nevertheless the analyses are built on the best information available at this time and relate to the average situation in a particular fleet segment. The consultation highlights that discard rates can vary from vessel to vessel due to a range of variables and therefore a choke analysis tool that can be applied to individual vessels could be useful.

11.1.2. TARGET STOCKS

All POs consulted were concerned about the negative impact of the landing obligation on their fleet and the wider fishing industry. However, there were differences in the degree of concern evident. One factor that appeared to influence the degree of concern is the target catch of the fleet segments. The feedback showed that the greatest challenges are envisaged for the fleet segments operating in areas of mixed species that are caught by the same gear. Where a fleet is targeting a single stock, the gear they use is designed to target that specific stock, for example vessels using pots and traps targeting nephrops. Where a fleet is targeting several stocks that are all caught using the same method, such as those stocks targeted by whitefish trawl/seine fleet, it is extremely difficult to predict catch composition and therefore 'target' fishing activity.

The feedback showed a much greater level of concern about the future of the whitefish trawl/seine segment. As demonstrated in the national choke analyses in earlier chapters, several stocks can be expected to act as choke species in the whitefish trawl/seine fishery.

In contrast, POs with nephrops pots and longline segments believe that survivability and selectively will lead to less significant direct consequences from the landing obligation. However, while it was the view of the POs that these segments will be less affected than other segments there remains uncertainty about how exactly operations might be directly and indirectly affected by the landing obligation.

The exception to the conclusion that more targeted fisheries are less affected is the Nephrops Trawl segment. Although the fleet is targeting a single stock, a by-catch of whitefish is common. Whilst 2016 is generally less of a concern, 2019 is considered to present very challenging conditions for this fleet segment, as indicated in the national choke analyses. One consultee representing this segment commented that, even with all the fleet's existing efforts to avoid areas with finfish and to use selective gear, that there are still situations when vessels get a surprise haul of fish.

11.1.3. THE IMPACT OF STOCKS WITH LOW QUOTAS

Another significant topic during the consultations was stocks with low quota allocations that are not target species, but can be difficult to avoid. The greatest concern is that these stocks could effectively close a fishery before it even begins. The West of Scotland was an area of particular concern. In addition to the stocks considered in the choke analyses, one consultee also raised concerns over unintended catches of pelagic stocks. No one consulted knows how these issues will be addressed. One consultee commented that it is very difficult, if not impossible, to cut out very small numbers of a stock whilst still catching other stocks. The POs already have experience of their fleets trying to avoid cod and understand how difficult it is to achieve such an ambition in practice.

Low quota stocks caused difficulty in analysing the impact of the landing obligation. Furthermore stocks for which no quota is allocated to POs such as cod WS could in theory halt a fishery before a vessel leaves the port. As explained in Chapter 3, to produce a meaningful analysis, these non-allocated stocks that affect a segment were highlighted but had to be set aside for the quantitative analysis and an assumption made that a solution will be found that allows a fleet to be active in the area. The PO consultations showed that no one knew how this might be achieved.

11.2. FEEDBACK ON POTENTIAL MANAGEMENT SOLUTIONS UNDER THE LANDING OBLIGATION

During the consultations a number of potential measures that could mitigate the impact of the landing obligation were discussed. Most are already available to the fleet including some forms of flexibility, improvements in gear technology and the strategy of individual vessels and POs. The Landing Obligation is expected to be combined with a quota uplift in TACs as discussed in the choke analysis and the regulation includes the potential for de minimis and survivability exemptions as discussed in Chapter 2.

In theory both existing and newly available measures have the potential to mitigate some of the impacts of the landing obligation. Management measures discussed with the POs included:

- Interspecies flexibility;
- De minimis;
- Gear Technology; and
- PO quota management (investment, swaps, monthly management).

However, the consultees expect the impact of the landing obligation to be so significant and the scope of these measures too limited to effectively mitigate the impact of the landing obligation on key fleet segments. Feedback from consultees on each of these tools is discussed below.

11.2.1. INTERSPECIES FLEXIBILITY AND DE MINIMIS

Some flexibility is already available to POs, which enables them to better match quota allocation with catch composition. Existing flexibility measures allow a transfer of quota between different sea areas for a small number of stocks.

When consultees were asked about how the new interspecies flexibility proposed for the landing obligation might impact on the outlook for their fleet segments there was little understanding of how it might be implemented. This is an understandable response as there is not yet clarity. There were hopes that much more flexibility could be introduced, but little confidence that it could achieve a substantial improvement in outlook. A small number of consultees highlighted that additional flexibility measures are likely to further complicate the work of POs and that the practical implementation of such a management tool had to be carefully considered.

Whilst little was known about how flexibility might work it was a concept familiar to consultees through existing arrangements. However there was even less understanding of what de minimis could provide to the UK fleet. When asked about de minimis the most common response can be summed up by ‘no idea’. There was an expectation from some consultees that the UK will propose a more strict interpretation of de minimis than other Member States but no one was clear what that might enable the fleet to do.

Hopes for de minimis included derogations for flatfish and nephrops and that there could be a percentage form of allowable discards on other species. Consultees appeared to expect that de minimis will do little to address challenges in target stocks.

11.2.2. GEAR TECHNOLOGY

There were wide ranging discussions on gear technology during the consultations. Overall the consultees strongly believe that a substantial amount has already been achieved through advancements in gear technology and that further improvements will be limited to enhancements to existing systems. Alternatives are always being tried or tested, but there is considered to be limits to how much more improvement is possible because of the very nature of fishing activity. For example trying to eliminate very small catches of one stock from a mixed fishery is likely to be extremely difficult and not economically viable. One consultee commented that although changing mesh sizes could work for one

year to avoid small non-target choke species, in the following year the non-target fish that skippers sought to avoid would still be there but bigger and harder to avoid retaining in nets. Also there was a belief that mesh size can only get so big before target stocks as well as unwanted bycatch species are lost from the net.

The only area where some consultees thought a meaningful improvement could be achieved is in the nephrops trawl fleet where there appears to be a range of approaches to selectivity already operational. However, one consultee cautioned that the same gear on different grounds could have different results.

11.2.3. PO QUOTA MANAGEMENT AND TACTICS

To ensure that fleet segments can continue to operate throughout the year the POs have a range of management measures available to them. Trading quota is perhaps the most significant of these. It is evident through comparing initial quota allocation and end of year landings that there is a reliance on trading and swaps within POs, between POs and internationally to match catch to available quota. The choke analysis presented to the POs was based on initial quota allocation to the PO.

Several consultees voiced a concern that the level of uncertainty associated with estimates of total catch and catch composition, and how the landing obligation will work in practice, may stifle the trade in quota. Comments were received that there are already signs that people are starting to buy up quota and consultees are concerned that one response to the landing obligation might be that quota holders are less inclined to trade quota until perhaps the latter part of the year. With even highly targeted and selective fisheries dependent on trading quota it is possible that an indirect impact of the landing obligation could be a reduction in quota trading to the detriment of all fleets. One consultee believed that while this might occur in the short-term the need to survive would force the industry to re-establish a trade in quota. Whether this new market would operate in the same way and offer the same access to quota as it has previously is difficult to predict. A small number of consultees did not believe that the trading of quota would be affected by the landing obligation. However, two consultees went as far as to say they struggled to see how quota management could function under the new regime.

Another issue raised by POs is that ‘quotas don’t come out till April/May’. In advance of this, POs have to make assumptions about the swaps they will be able to achieve and the activity of the fleet is informed by these assumptions. If the quota market changes it will be difficult to make any assumptions and in the short-term this could cause substantial challenges.

There was a widely-held expectation that the POs will seek to increase their own quota holdings where possible.

In general those consulted did not believe vessel owners could do much more than they already do to match catch to quota holdings. A small number of fleet segments might be able to move to avoid stocks that they are not allowed to catch but there was a fear that where this is possible it could lead to an increased concentration of fishing activity in areas where there is less risk of catching choke species to the potential detriment of stocks and fleet already in the area.

11.2.4. PHASING

Although phasing was not a specific topic in the consultation structure a number of consultees raised the potential for more phasing in the implementation of the landing obligation. It is understood that this is being widely discussed. However, the impression received from consultees is that it was recognised that this might do little more than buy some time.

11.2.5. ADDITIONAL ISSUES RAISED

In addition to the subject areas that were included in the PO questionnaire, the POs raised additional issues during the consultations. The most common focused on concerns about the knock-on impacts of the landing obligation onshore. The following issues were raised:

- Who will take responsibility for fish that have no market once they have been landed and where will they go? There are only two fishmeal factories in the UK mainland and volumes may be very low at a high number of different ports. Specific questions raised were:
- How and where will undersize fish or fish with no commercial value be stored onshore?
- How will the fish be disposed of, and who will pay for transport and disposal?
- Buyers demand year round supply yet an entire fleet segment could choke early on a non-target stock. How can year round supply to processors be managed under the landing obligation?
- Fleet viability has been supported by guard duty for the oil and gas industry but with the industry reducing investment as a result of oil prices this opportunity for the fleet may be reducing.

The first two issues amongst others will be investigated further in the third phase of the economic impact assessment, which focuses on the onshore impacts of the landing obligation.

11.3. SUMMARY OF FEEDBACK

The feedback from POs can be briefly summarised as great uncertainty over how the landing obligation might become operational. The degree of uncertainty present around the implementation of the landing obligation makes it extremely challenging for the POs to understand what the future might look like. The sources of uncertainty include, but are unlikely to be limited to:

- Uncertainty around the true discard rates and therefore the true catch volume and composition of PO fleet segments and the UK fleet as a whole;
- Uncertainty around how stocks with very low quotas will be treated;
- Uncertainty around how the possible exemptions and derogations might be implemented;
- Uncertainty about how the market for fish landings will respond to landings that may not be available year round and the lower volumes that could be landed;
- Uncertainty around how the market for quota will respond to the new regime; and
- Uncertainty around who will be responsible for landings that have no immediate market.

What was clearly stated by the POs is that:

- Avoiding a stock that shares characteristics with your target stock is extremely difficult;
- Selective gear technology has its limitations; and
- Quota and fleet management will become extremely complex and challenging.

It was clearly evident during the consultations, that if the landing obligation is implemented as consultees expected that it will be, they believe it will result in a crisis amongst key fleet segments throughout the UK.

12. SUMMARY OF THE CHOKE ANALYSIS

12.1. PURPOSE AND APPROACH

Article 15 of the reformed Common Fisheries Policy (EC Reg. 1380/2013) introduces a regulatory requirement for the EU fishing fleet to land all catches subject to catch limits or quotas (the landing obligation).

The landing obligation was implemented for EU pelagic fisheries from January 2015. For demersal (white fish and nephrops) fisheries, the landing obligation will come into force on 1 January 2016. The proposal is that transitional rules will apply from 1 January 2016 until 31 December 2018. These transitional rules will mean that only some species are subject to the landing obligation. Full implementation of the landing obligation, when the full catch of demersal species will have to be landed, is due to occur on 1 January 2019.

The main purpose of the choke analysis is to understand, if the landing obligation had been implemented in 2013, what impact the landing obligation might have had on the activity of different fleet segments. To understand what impact the landing obligation could have had in 2013 the choke analysis:

- identifies choke species that could have had an impact on the activity of a home nation fleet segment. Choke species are those species for which initial quota allocation would have been used up in fewer days than the fleet actually fished in 2013;
- identifies the primary choke species for a home nation fleet segment, i.e. the species that would be first to create a choke;
- calculates how many days of fishing it would take until the primary choke species might affect the activity of a home nation fleet segment;
- illustrates the possible effects of mechanisms designed to alleviate the choke situation under the landing obligation. The choke analysis considers the potential benefit of transitional rules (from 2016), quota uplift and interspecies flexibility. The extent to which quota uplift and interspecies flexibility might have been available in 2013 is based on ICES advice from 2012. Descriptions of these mechanisms are included in Chapter 2.

12.2. KEY ISSUES

A number of challenges were faced in the development of a choke analysis for the landing obligation. These include but are not limited to: uncertainty over the implementation and operation of the landing obligation; limited evidence on discarding and therefore actual catch volumes; the existence of quota species for which no quota is allocated to POs; and a dependency on trading and swaps to support catching activity.

12.3. CALCULATIONS AND ASSUMPTIONS

The key calculations and assumptions used to prepare the choke analysis are summarised below. Further detail can be found in Chapter 3 and Appendix A.

- The choke analysis is a retrospective analysis which considers what might have happened in 2011, 2012 and 2013 had the landing obligation been implemented.
- The presentation of findings in this report is focused on 2013.
- Vessels have been allocated to one of six fleet segments based on registered home nation, gear type and species targeted.

- The initial quota allocation to a vessel has been allocated to the fleet segment to which the vessel has been allocated. Quota held on dummy licences within POs has been distributed proportionately to vessels within that PO according to each vessel's proportion of landings of each species in 2013.
- The choke analysis is based on initial quota allocation to each fleet segment, therefore the implications of trading quota in or out of the fleet segment are not considered.
- Effort is based on actual days fished in 2013.
- Catch is based on actual landings in 2013 plus calculated discards.
- Discard rates have been calculated to be specific to the segment type, i.e. whitefish trawl/seine, nephrops trawl and beam trawl, and are based on either Marine Scotland data, Cefas data or a combination of both.
- Catch rate (tonnes per day) is calculated by dividing estimated catch volume for each species by actual days at sea.
- Expectations on access to quota uplift and interspecies flexibility in 2013 is based on ICES advice from 2012.
- Area VII has been treated as a single area.

12.4. ACTIVITY AND SIZE OF FLEET SEGMENTS IN THE CHOKE ANALYSIS

Six fleet segments were analysed in the choke analysis. The number of vessels, actual landings of demersal quota species and actual days at sea in 2013 is detailed in Table 12-1.

Based on these measures of size and activity the largest fleet segments are in Scotland:

- The Scottish nephrops trawl fleet had the largest number of vessels and the highest number of days at sea in 2013; and
- The Scottish whitefish trawl/seine fleet had the highest volume of landings in 2013.

The smallest fleet segment included in the choke analysis is the England nephrops trawl fleet which had 35 vessels in 2013.

Home Nation and Fleet Segment	Total Number of Vessels in 2013	Actual landings of demersal quota species in 2013 (tonnes)	Actual Days at Sea in 2013	% of total days spent in each area by each fleet segment		
				Area IV North Sea	Area VI West of Scotland	Area VII
England whitefish trawl/seine	93	21,741	15,316	23	0	77
Scotland whitefish trawl/seine	121	76,293	21,155	79	15	5
England nephrops trawl	35	1,520	3,884	72	13	15
Northern Ireland nephrops trawl	99	8,574	13,764	6	17	77
Scotland nephrops trawl	208	21,423	33,457	37	61	2
England beam trawl	70	15,057	14,387	30	0	70
Total	626	144,608	101,963	-	-	-

Table 12-1: Size and activity of the home nation fleet segments included in the choke analysis, 2013

12.5. CHOKE ANALYSIS FINDINGS

The findings from the choke analysis are highly detailed and are summarised in Chapters 4-9. Tables 12-2, 12-3 and 12-4 provide an overview of the findings and show the potential value of transitional rules, uplift and flexibility.

A very high level summary for each fleet segment type is also provided below.

12.5.1. WHITEFISH TRAWL AND SEINE FLEET SEGMENT

The choke species identified for the England and Scotland whitefish trawl and seine fleet segments do vary. The only species that are repeated in the first five choke species lists for both fleet segments are:

- hake and saithe in the North Sea; and
- cod 7BK and plaice 7DE in Area VII.

The most important sea area for the England fleet, in terms of volume landed and days at sea, is Area VII. The fleet spent 11,745 days in Area VII in 2013. Under transitional rules the primary choke species has been identified as cod 7BK, a species that features in several first five choke species lists. The estimated days that the initial quota allocation of cod 7BK would enable the England fleet to fish for is 2,054 days. This equates to an average of 25 days (with uplift) per vessel compared to an average of 126 days fished in 2013. From 2019, under full implementation of the landing obligation, the choke species is identified as sole 7D. The initial quota allocation to this fleet for sole 7D would enable the fleet to fish for an estimated 18 days.

The most important sea area for the Scotland fleet, in terms of volume landed and days at sea, is the North Sea. The fleet spent 16,797 days in the North Sea in 2013. Under transitional rules the primary choke species has been identified as saithe. The estimated days that the initial quota allocation of saithe would enable the Scotland fleet to fish for is 6,776 days. This equates to an average of 56 days per vessel compared to an average of 139 days fished in 2013. From 2019, under full implementation of the landing obligation, the choke species is identified as hake. The initial quota allocation to this fleet for hake would enable the fleet to fish for an estimated 35 days (with uplift).

12.5.2. NEPHROPS TRAWL FLEET SEGMENT

The choke species identified for the England, Northern Ireland and Scotland nephrops trawl fleet segments do vary. The following species are listed on at least two of the segment's first five lists:

- There is no species that is repeated in the first five choke species for all three fleet segments in Area VII. Cod 7BK, plaice 7A, whiting 7A, whiting 7BK appear on two lists;
- In the North Sea dabs appears on all three lists and hake, cod and tusk appear on two lists;
- In the West of Scotland there was insufficient data to provide a choke analysis for the England nephrops trawl fleet. Ling, hake and plaice appear on the first five list for both Northern Ireland and Scotland.

The most important sea area for the England fleet, in terms of volume landed and days at sea, is the North Sea. The fleet spent 2,811 days in the North Sea in 2013. Under transitional rules no species is identified as a choke species as the segment had sufficient quota for its catch of nephrops. From 2019, under full implementation of the landing obligation, the choke species is identified as hake. The estimated days that the initial quota allocation of hake would enable the England fleet to fish for is 150 days. This equates to an average of 5 days (with uplift) per vessel compared to an average of 80 days fished in 2013.

The most important sea area for the Northern Ireland fleet, in terms of volume landed and days at sea, is Area VII. The fleet spent 10,659 days in Area VII in 2013. Under transitional rules the primary choke species has been identified as nephrops. The estimated days that the initial quota allocation of nephrops would enable the Northern Ireland fleet to fish for is 10,543 days without uplift. This equates to an average of 106 days per vessel compared to an average of 108 days fished in 2013. However, with uplift applied, nephrops would cease to be a choke species as increase in initial quota allocation would exceed catch levels in 2013. From 2019, under full implementation of the landing obligation, the choke species is identified as cod 7BK. The initial quota allocation to this fleet for cod 7BK would enable the fleet to fish for an estimated 35 days (with uplift).

The most important sea area for the Scotland fleet, in terms of volume landed and days at sea, is the West of Scotland, although significant activity also took place in the North Sea. The fleet spent 20,495 days in the West of Scotland in 2013. Under transitional rules the primary choke species has been identified as nephrops. The estimated days that the initial quota allocation of nephrops would enable the Scotland fleet to fish for is 20,284 days. This equates to an average of 98 days per vessel compared to an average of 99 days fished in 2013. However, with uplift applied, nephrops would cease to be a choke species as increase in initial quota allocation would exceed catch levels in 2013. From 2019, under full implementation of the landing obligation, the choke species is identified as plaice. The initial quota allocation to this fleet for plaice would enable the fleet to fish for an estimated 39 days.

12.5.3. BEAM TRAWL FLEET SEGMENT

The most important sea area for the England fleet, in terms of volume landed and days at sea, is Area VII. The fleet spent 10,083 days in Area VII in 2013. Under transitional rules the primary choke species has been identified as plaice 7HJK. The estimated days that the initial quota allocation of plaice 7HJK would enable the England fleet to fish for is 3,091 days. This equates to an average of 44 days per vessel compared to an average of 144 days fished in 2013. From 2019, under full implementation of the landing obligation, the choke species would also be plaice 7HJK.

Sea Area	Home Nation	Days fished in sea area by segment in 2013		Impact identified for 2013 under transitional rules (from 2016) of landing obligation					Impact identified under full implementation (from 2019) of landing obligation				
		Total days	Avg. days per vessel	Primary choke species	A: Total fishing days for fleet segment until initial quota allocation of choke species used up	B: Average fishing days per vessel until initial quota allocation of choke species used up	Average fishing days per vessel plus uplift (B + uplift)[2]	Interspecies flexibility available?	Primary choke species	C: Total fishing days for fleet segment until initial quota allocation of choke species used up	D: Average fishing days per vessel until initial quota allocation of choke species used up	Average fishing days per vessel plus uplift (D + uplift)[2]	Interspecies flexibility available?
N. Sea	England	3,548	37	haddock	935	10	11	Yes	hake	286	3	3	Yes
WoS	England	23[1]	-	-	-	-	-	-	-	-	-	-	-
Area VII	England	11,745	126	cod 7BK	2,054	22	25	Yes	sole 7D	1,649	18	18 (no uplift)	Yes
N. Sea	Scotland	16,797	139	saithe	6,776	56	56 (no uplift)	Yes	hake	4,073	34	35	Yes
WoS	Scotland	3,231	27	saithe	1,727	14	14 (no uplift)	Yes	saithe	1,727	14	14 (no uplift)	Yes
Area VII	Scotland	1,127	9	cod 7BK	182	2	2	Yes	cod 7BK	182	2	2	Yes

Table 12-2: Summary of choke analyses for England and Scotland whitefish trawl/seine fleet segments in 2013

[1]A choke analysis is not presented for England whitefish trawl/seine fleet segment in Area VI, West of Scotland, due to small number of days.

[2]Where '(no uplift)' is specified it means that, based on ICES advice from 2012, no quota uplift would have been available for the choke species identified. In cases where uplift is available but no increase in the average days is shown this means that the uplift resulted in only a fractional increase of less than one day.

Sea Area	Home Nation	Total days fished in sea area by segment in 2013		Impact identified for 2013 under transitional rules (from 2016) of landing obligation					Impact identified under full implementation (from 2019) of landing obligation				
		Total days	Avg, days per vessel	Primary choke species	A: Total fishing days for fleet segment until initial quota allocation of choke species used up	B: Average fishing days per vessel until initial quota allocation of choke species used up	Average fishing days per vessel plus uplift (B + uplift)[1]	Interspecies flexibility available?	Primary choke species	C: Total fishing days for fleet segment until initial quota allocation of choke species used up	D: Average fishing days per vessel until initial quota allocation of choke species used up	Average fishing days per vessel plus uplift (D + uplift)[1]	Interspecies flexibility available?
N. Sea	England	2,811	80	none	-	-	-	-	hake	150	4	5	Yes
WoS	England[2]	486	14	none	-	-	-	-	none	-	-	-	-
Area VII	England	587	17	none	-	-	-	-	whiting 7BK	284	8	8 (no uplift)	Yes
N. Sea	N. Ireland	767	8	none	-	-	-	-	dabs	253	3	3 (no uplift)	No
WoS	N. Ireland	2,338	24	none	-	-	-	-	ling	1,410	14	14 (no uplift)	No
Area VII	N.Ireland	10,659	108	nephrops	10,543	106	133	No	cod 7BK	3,055	31	35	Yes
N. Sea	Scotland	12,261	59	none	-	-	-	-	hake	263	1	1	Yes
WoS	Scotland	20,495	99	nephrops	20,284	98	120[3]	No	plaice	8,069	39	39 (no uplift)	No
Area VII	Scotland	701	3	nephrops	598	3	4	No	cod 7BK	31	0.15	0.17	Yes

Table 12-3: Summary of choke analyses for England, Northern Ireland and Scotland nephrops trawl fleet segments in 2013

[1]Where '(no uplift)' is specified it means that, based on ICES advice from 2012, no quota uplift would have been available for the choke species identified. In cases where uplift is available but no increase in the average days is shown this means that the uplift resulted in only a fractional increase of less than one day.

[2]There is insufficient data available to identify a choke species for the England nephrops trawl fleet fishing West of Scotland in 2013.

[3]The average fishing days per vessel until initial quota allocation of nephrops is used up, plus uplift, is 120 days, this exceeds the average days actually used in 2013 and therefore the initial quota allocation of nephrops no longer chokes the fleet segment.

Sea Area	Home Nation	Total days fished in sea area by segment in 2013		Impact identified for 2013 under transitional rules (from 2016) of landing obligation					Impact identified under full implementation (from 2019) of landing obligation				
		Total days	Avg, days per vessel	Primary choke species	A: Total fishing days for fleet segment until initial quota allocation of choke species used up	B: Average fishing days per vessel until initial quota allocation of choke species used up	Average fishing days per vessel plus uplift (B + uplift)[1]	Interspecies flexibility available?	Primary choke species	C: Total fishing days for fleet segment until initial quota allocation of choke species used up	D: Average fishing days per vessel until initial quota allocation of choke species used up	Average fishing days per vessel plus uplift (D + uplift)[2]	Interspecies flexibility available?
N. Sea	England	4,303	61	plaice	462	7	10	Yes		plaice	462	7	10
WoS	England	1[1]	-	-	-	-	-	-		-	-	-	-
Area VII	England	10,083	144	plaice 7HJK	3,091	44	44 (no uplift)	No		plaice 7HJK	3,091	44	44 (no uplift)

Table 12-4: Summary of choke analyses for England beam trawl fleet segment in 2013

[1]A choke analysis is not presented for the England beam trawl fleet segment in Area VI, West of Scotland, due to small number of days.

[2]Where '(no uplift)' is specified it means that, based on ICES advice from 2012, no quota uplift would have been available for the choke species identified. In cases where uplift is available but no increase in the average days is shown this means that the uplift resulted in only a fractional increase of less than one day.

12.6. SUMMARY OF FEEDBACK FROM POS

An assessment of gear types per PO produced a list of 76 fleet segments across UK POs. A PO specific choke analysis was undertaken for each group with five or more vessels in it, resulting in 29 segment choke analyses.

Consultees were asked for their views on key data contained in each choke analysis. In summary, the majority thought the choke species seemed correct, but there was less agreement over the accuracy of discard rates. Six of the 14 stated that one or more of the discard rates was considered to be lower than the actual rate and another five did not know if the discard rates reflect reality.

Lack of knowledge around current catch compositions combined with uncertainty around how the landing obligation is going to be implemented has made it very difficult for POs to identify how to avoid or mitigate negative impacts of the landing obligation on the fleet.

For the majority of segments the PO representatives were clear that it is difficult, if not impossible, to fully avoid catching the identified choke species and that initial quota allocation does not match recent catch composition. There are fears that the true impact of the landing obligation could be worse than predicted in the baseline choke analyses presented to the POs. In segments that are already highly selective or could become more selective there were fewer concerns about choke species, however many of these segments are highly dependent on trading quota during the fishing year and could be significantly impacted if the quota market is affected.

The feedback from POs can be briefly summarised as substantial uncertainty over how the landing obligation might become operational and how their vessels could operate under its rules. What was clearly stated by POs is that:

- Avoiding a stock that shares characteristics with your target stock is extremely difficult;
- Selective gear technology has its limitations; and
- Quota and fleet management will become extremely complex and challenging. Two PO representatives commented that they cannot envisage how quota management can work at all under the landing obligation.

It was clearly evident during the consultations in November and December 2014 that PO representatives believe that, if the landing obligation is implemented as they think it might be, the landing obligation would result in a crisis amongst key fleet segments across the UK.

12.7. CONCLUSIONS FROM THE CHOKE ANALYSIS

For each home nation fleet segment the analysis has identified primary choke species and estimated the number of days of fishing that could have fully caught the initial quota allocation of each primary choke species under transitional rules from 2016 and from 2019. For many fleet segments the potential impact of the primary choke species, especially under the landing obligation from 2019, is very substantial. However, it is not possible to say what impact the landing obligation, and as a consequence choke species, might actually have had on each fleet segment if implemented in 2013. Depending on implementation policy it is hypothetically possible that each fleet segment would have had to stop fishing after the number of fishing days calculated for each primary choke species. However, this could be considered the worst case scenario (unless actual discard rates are higher than recorded) as there are options that may have been available to reduce the impact of the choke species and that could have enabled the fleet to keep fishing for longer. These options are in addition to the transitional rules (from 2016) and uplift considered in the choke analyses. The additional options that could reduce the impact of the choke species and therefore the impact of the landing obligation include:

- a more generous allocation of uplift;
- exceptions and derogations agreed under the landing obligation;
- changes to gear;

- changes to fishing tactics including real-time management options; and
- securing additional quota for choke species through leasing or swaps, including more effective international trading of quota.

The benefit of each of these potential options will be to either:

- reduce the catch rate associated with choke species and thereby increase the number of days until initial quota allocation for the choke species is used up;
- increase the quota for choke species and as a result increase the number of fishing days; or
- exclude one or more choke species from the landing obligation.

The scale of benefit that might be achieved from each source of mitigation is expected by PO representatives to be limited and at this stage it is very difficult, if not impossible, to gauge how much difference they can make. Furthermore, at the time of writing there is still a great deal of uncertainty about how the landing obligation will be implemented. Therefore, as a consequence of these difficulties, it is not possible to estimate the potential combined benefit of these measures to fleet segments and the UK as a whole.

12.8. NEXT STEP – BIOECONOMIC MODEL (INTERIM REPORT TWO)

The purpose of the bioeconomic modelling analysis is to produce findings that illustrate the relative difference in outcomes between different scenarios for the implementation of the landing obligation.

Interim Report Two will present the findings from the model and provide analysis of the potential difference to the 'choke baseline' for each fleet segment from different scenarios. These scenarios create definitions for de minimis, interspecies flexibility and survivability and combine their potential impact. The findings will not represent robust estimates of future impact, because of the uncertainties discussed above, but will improve understanding of which measures within the scope of the landing obligation can make a difference to key UK fleet segments and how.

APPENDIX A: CALCULATIONS AND ASSUMPTIONS

Appendix A provides further detail on how discard rates have been applied and additional clarification on the assumptions used.

DISCARD RATE CALCULATIONS

Marine Scotland data only covers trips that took place in the North Sea (ICES area IV) or along the West Coast of Scotland (ICES area VI). There is therefore no Marine Scotland data for the Irish Sea (ICES area VIIa) and other parts of ICES Area VII.

CEFAS data covers trips that took place in the North Sea (ICES area IV), in the Irish Sea (ICES area VIIa) and in other part of ICES area VII. CEFAS does not collect discard data along the West Coast of Scotland (Area VI).

After allocating the discard data per gear segment (whitefish trawl/seine, nephrops trawl and beam trawl) and area (North Sea, West Coast of Scotland, Irish Sea, other Area VII), there is, for the majority of segments, not enough information to produce discard rates specific to each home nation, particularly as only one organisation collects data in the West of Scotland and Area VII. Therefore using the available data 'UK' discard rates are identified for each fleet segment. There are two exceptions. Area and home nation specific discard rates are used for the Scotland whitefish trawl/seine fleet segment in the North Sea and the Scotland nephrops trawl fleet in the North Sea.

Discard data has been provided by CEFAS and Marine Scotland for 2011, 2012 and 2013. The data used is taken from sample fishing trips in each of the fleet segments included in the choke analysis by the CEFAS and Marine Scotland observer programmes over the 3 years (Marine Scotland: 432 trips, CEFAS: 560 trips).

Data is available for each species caught during each trip, differentiating the retained weight and the discarded weight.

Additional data is available for each trip allowing characterisation of the vessel (gear, Seafish segment) and identifying the region based on the ICES area where the fishing trip took place.

The results presented in the different discard atlases are used to sense-check the discard rates obtained, but also to cover missing discard rates that were needed for the analysis

The discard rates are calculated following the same method as reported in the different discard atlases : the discard rate is the ratio between the sum of observed discard and the sum of observed catch for a specific species caught by a defined gear segment during a selected year:

$$discard\ rate\ for\ year\ Y\ by\ segment\ S = \frac{sum\ of\ observed\ discards\ for\ year\ Y\ by\ segment\ S}{sum\ of\ observed\ catch\ for\ year\ Y\ by\ segment\ S}$$

For a few stocks, observer data show that for all the observed trips, all the fish were discarded. In that case, the estimation of the discard rate equals 100%. Landings were however reported for the same stocks. This would cause the choke analysis and the model to produce errors. Discard data has therefore been re-estimated for these particular stocks to allow choke analysis and modeling to be

performed without error. Table A1 identifies the species and the year for which the anomaly existed and explains how the discard rate was recalculated.

Stock	Segment	Year for which discard rate is 100%	Re-estimation
Plaice WS	Whitefish trawl/seine	2011	based on 2012 and 2013 data
Skates & Rays NS	Nephrops trawl	2012, 2013	based on 2011 data
Cod 6B	Nephrops trawl	2011	based on 2012 and 2013 data
Cod WS	Nephrops trawl	2011	based on 2012 and 2013 data
Ling WS	Nephrops trawl	2013	based on 2011 and 2012 data
Plaice WS	Nephrops trawl	2012, 2013	based on 2011 data
Saithe WS	Nephrops trawl	2011, 2013	based on 2012 data

Table A1: Stocks for which observer programmes data show a 100% discard rate and re-estimation assumptions

For some stocks, the estimated discard rate is 100% over the three years. Re-estimation of discard rates as described above cannot be undertaken.

For these stocks, total catch is considered to be proportional to other stocks, based on a ratio calculated from the observer programmes' data (Table A2).

Stock	Segment	Proxy for catch	Ratio for 2011	Ratio for 2012	Ratio for 2013
Dab	Whitefish trawl/seine	Plaice	2.15%	8.20%	5.65%
Dab	Nephrops trawl	Plaice	26.70%	50.38%	41.67%
Tusk	Nephrops trawl	Cod	0.45%	0.03%	0.48%

Table A2: Stocks for which observer programmes data show a 100% discard rate for the three years

Discard rates for nephrops in the North Sea (5.7% in 2013) and West of Scotland (6.4% in 2013) were only observed by Marine Scotland for the Scotland nephrops trawl fleet. Discard rates for nephrops in Area VII (2.8% in 2013) were observed by Cefas. These discard rates have been used as a proxy for the discard rate for nephrops in all six fleet segments included in the choke analysis.

The PO specific analysis undertaken to inform the consultations was undertaken for the each of the PO segments shown as 'analysed' in Table A3.

Vessel segments analysed	Number of Vessels		
	2011	2012	2013
Under 10m sector Whitefish trawl / seine	185	199	174
Scottish Fishermen's Organisation Nephrops trawl	127	123	114
Northern Ireland Fish Producers' Organisation Nephrops trawl	87	86	83
Scottish Fishermen's Organisation Whitefish trawl / seine	45	44	47
Anglo Northern Irish Fish Producers' Organisation Nephrops trawl	27	29	29
Cornish Fish Producers' Organisation Whitefish trawl / seine	30	28	28
Non-sector over 10m Nephrops trawl	24	32	27
Anglo-Scottish Fish Producers' Organisation Nephrops trawl	29	26	23

Shetland Fish Producers' Organisation Whitefish trawl / seine	24	24	23
South West Fish Producers' Organisation Whitefish trawl / seine	25	21	23
West of Scotland Fish Producers' Organisation Nephrops trawl	22	21	22
South West Fish Producers' Organisation Beam trawl	20	20	20
Cornish Fish Producers' Organisation Gill netters	19	19	18
Cornish Fish Producers' Organisation Beam trawl	16	18	17
Fife Fish Producers' Organisation Nephrops trawl	13	16	17
Eastern England Fish Producers' Organisation Whitefish trawl / seine	15	15	15
Non-sector over 10m Beam trawl	7	22	14
Northern Producers' Organisation Nephrops trawl	14	13	11
Non-sector over 10m Whitefish trawl / seine	15	14	10
West of Scotland Fish Producers' Organisation Pots and traps	12	10	10
Aberdeen Fish Producers' Organisation Whitefish trawl / seine	10	9	9
Fleetwood Fish Producers' Organisation Longliners	8	8	7
Anglo-Scottish Fish Producers' Organisation Whitefish trawl / seine	8	6	6
Fleetwood Fish Producers' Organisation Gill netters	4	6	6
North Sea Fishermen's O Beam trawl	5	4	6
Northern Ireland Fish Producers' Organisation Whitefish trawl / seine	9	3	6
The Fish Producers' Organisation Whitefish trawl / seine	7	6	6
Wales and West Coast Fishermen Producer Organisation Whitefish trawl / seine	7	6	6
North Sea Fishermen's Organisation Whitefish trawl / seine	6	5	5
Vessel segments not analysed (below 5 vessels in 2013)			
Fleetwood Fish Producers' Organisation Whitefish trawl / seine	5	7	4
Interfish Beam trawl	4	4	4
Lowestoft Fishermen Producer Organisation Beam trawl	5	4	4
Lowestoft Fish Producers' Organisation Whitefish trawl / seine	5	5	4
Eastern England Fish Producers' Organisation Beam trawl	3	3	3
Eastern England Fish Producers' Organisation Nephrops trawl	4	4	3
North East of Scotland Fishermen's Organisation Beam trawl	9	7	3
North East of Scotland Fishermen's Organisation Nephrops trawl	3	2	3
Northern Producers' Organisation Whitefish trawl / seine	7	5	3
Orkney Fish Producers' Organisation Nephrops trawl	3	3	3
Orkney Fish Producers' Organisation Whitefish trawl / seine	5	4	2
North East of Scotland Fishermen's Organisation Whitefish trawl / seine	2	3	1
Fife Fish Producers' Organisation Whitefish trawl / seine	3	2	1

Table A3: PO vessel segments analysed

ADDITIONAL DETAIL ON ASSUMPTIONS DESCRIBED IN CHAPTER 3

The following section is designed to provide further clarification on assumptions made in the choke analysis.

Fleet Segmentation

Vessels were allocated to a fleet segment following the normal and widely accepted Seafish segmentation approach. The Seafish criteria used in allocating a vessel to a particular segment includes: the physical characteristics of the vessels, activity level, the gear used, the primary species targeted (across the year) and the areas fished. For the choke analysis the home nation in which the vessel is registered was also used to determine its segment. The result of the segmentation approach is that each over 10m vessel that was allocated to one of the following segments was included in the choke analysis. In total this amounted to 626 vessels:

- England whitefish trawl/seine;
- Scotland whitefish trawl/seine;
- England nephrops trawl;
- Northern Ireland nephrops trawl;
- Scotland nephrops trawl; and
- England beam trawl.

Data was transmitted to Seafish according to the segmentation of each vessel as outlined above. To ensure consistency the same segmentation approach was used to aggregate data for landings, effort and discards.

Alternative segmentation approaches could lead to different results. For example the discard rates applied in the choke analysis do not reflect the often used TR1 and TR2 discard rates. TR1 and TR2 classification was not used because Article 15 segments the fleet by the species targeted, not the gear used.

Catch Rate and Seasonality

Total catch (i.e. landings plus discards) is determined by applying the discard rate to landings for each species. The catch rate for each species is assumed to be constant throughout the year and **no seasonality** is taken into account. The use of an average catch rate means that, for choke species affected by seasonality, the choke analysis could under or over-estimate the potential impact of the choke. For example if a choke species appears early in the year for a particular fishery, there is a risk it could restrict fishing operations earlier than estimated in the choke analysis (the choke analysis assumes no change in fishing tactics). Similarly, if a choke species appears later in the year for a particular fishery, then the choke species could have a less detrimental impact than shown in the choke analysis.

Effort

The analysis assumes that effort management is not as restrictive as quota and is not limiting quota uptake. The average days at sea of the fleet are therefore assumed to be the optimal days in order to catch the available quota.

Initial quota allocation and Dummy licenses

Choke species and choke points will vary vessel to vessel depending on the quota available to that individual vessel owner. To enable the choke analysis to be undertaken for home nation fleet segments assumptions are required. Quota allocation to a fleet segment requires assuming how FQAs not attached to a vessel, i.e. on a dummy license, are allocated to or accessed by a fleet segment. The choke analysis has assumed that quota held by POs on dummy licenses is allocated across fleet segments in proportion to landings.

The allocation of entitlements and quota units on dummy licences to each vessel in a fleet segment is defined by the PO which each vessel is a member of:

- each vessel is allocated to a PO (based on PO membership - MMO data).
- PO dummy license FQAs were converted into tonnes and allocated to vessels in the PO according to the proportion of landings of the relevant species recorded for each vessel in 2013.

The total quota per vessel is calculated by adding together the tonnage based on the FQAs attached to the vessel plus any quota allocated from dummy licences held within the vessel's PO. Once a total tonnage quota has been established for a vessel, the quota allocated to vessels in each fleet segment is aggregated to reach a total quota by species for each fleet segment. For example, 799 tonnes of nephrops quota for the North Sea was held by the Northern Ireland nephrops trawl fleet in 2013.

No leasing and swaps

The analysis presents the situation before any leasing in and swaps occur, i.e. it is based only on the initial quota allocation to a home nation fleet segment. This has been done because the extent to which leases and swaps would be available under a landing obligation are unknown. However, as quota has been aggregated at a home nation level it is anticipated that the aggregation of vessels across different POs has in effect enabled the effect of potential 'swaps' within the home nation to be incorporated.

Quota uplift

A detailed description of how quota uplift has been calculated and applied is contained in Chapter 3. One additional point to note is that although quota uplift is often discussed as equivalent to discard rates, this is not how it appears in the choke analysis. The volume of quota uplift anticipated has been based on ICES advice from 2012 as this would have informed decisions on uplift in 2013. However, the discard rates used reflect the observed discard rates by UK vessels in the North Sea, West of Scotland and Area VII in 2013. These vary to different degrees from the discard estimates presented by ICES.

APPENDIX B: NATIONAL CHOKE ANALYSES

Please see separate spreadsheet file for the detail of national choke analyses.