

**Marine Stewardship Council (MSC) Final Report**

**North Sea and Eastern Channel trammel net sole fishery**

**On behalf of FROM Nord**

**Prepared by ME Certification Ltd**

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**Authors: Jo Gascoigne  
Chrissie Sieben  
Sophie des Clers  
Mike Pawson**

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## Glossary

Term / acronym	Definition
IVc	Southern North Sea ICES Division
VIIId	Eastern Channel ICES Division
AAMP	Agence des Aires Marines Protégées
AC	Advisory Council (EU)
ACOM	ICES advisory committee
B	Biomass
B <sub>lim</sub>	Biomass limit reference point
B <sub>loss</sub>	Biomass corresponding to the lowest observed SSB
B <sub>MSY</sub>	Biomass MSY-based reference point
B <sub>pa</sub>	Biomass precautionary reference point
BTS	Beam trawl survey
CFP	Common Fisheries Policy (EU)
CNPM	Comité National des Pêches Maritimes et des Elevages Marins
CNSP	Centre National de Surveillance des Pêches (based at CROSS-Etel)
CROSS	Centre Régional Opérationnel de Surveillance et de Sauvetage
CRPM	Comité Régional des Pêches Maritimes et des Elevages Marins
CRPM-NPP	CRPM Nord Pas de Calais Picardie
CV	Coefficient of variation
DDTM	Direction Départementale des Territoires et de la Mer
DIRM MEMN	Direction Interrégionale de la Mer - Manche Est Mer du Nord
DML	Délégation à la mer et au littoral (of DDTM)
DPMA	Direction des pêches maritimes et de l'aquaculture
EEZ	Exclusive Economic Zone
EFCA	European Fisheries Control Agency
ETP	Endangered Threatened or Protected species
EU	European Union

EUNIS	European Nature Information System
F	Fishing mortality
F <sub>MSY</sub>	Fishing mortality MSY-based reference point
F <sub>pa</sub>	Fishing mortality precautionary reference point
F <sub>MP</sub>	Fishing mortality management plan reference point
FROM Nord	Fonds Régional d'Organisation du Marché du poisson pour le Nord (PO)
HCR	Harvest control rule
HN	Haute Normandie
IBTS	International bottom trawl survey
ICES	International Council for the Exploration of the Sea
ISBF	Introduced Species Based Fisheries
LTL	Low-Trophic Level species
M	Natural mortality
MCS	Monitoring control and surveillance
MEC	ME Certification Ltd.
MLS	Minimum Landing Size
MNHM	Muséum National d'Histoire Naturelle
MP	Management plan
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSFD	Marine Strategy Framework Directive (EU)
MSY	Maximum sustainable yield
NAO	North Atlantic Oscillation
NSAC	North Sea Advisory Council
NPCP	Nord Pas de Calais Picardie
NWWAC	North Western Waters Advisory Council
PI	Performance Indicator
PO	Producer organisation
RIC	Réseau Inter-Criées
SIOP	Système informatisé d'observation des Organisations de Producteurs

SMS	North Sea multispecies assessment model
S/R	Stock / recruitment
SSB	Spawning stock biomass
SSB <sub>MP</sub>	SSB of the management plan, usually a trigger value
SST	Sea surface temperature
STECF	Scientific, Technical and Economic Committee For Fisheries (EU)
TAC	Total allowable catch
UoC	Unit of Certification
VMS	Vessel monitoring system
VPA	Virtual population analysis
WG	Working Group
WGNSSK	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (ICES)
WKNSEA	Benchmark Workshop on North Sea Stocks (ICES)
WKBYCS	Workshop to Review and Advise on Seabird Bycatch (ICES)

## Executive Summary

This report is the Final Report for the FROM Nord trammel net sole fishery. The assessment team consisted of Dr Jo Gascoigne (Team Leader), Dr Mike Pawson (Principle 1), Chrissie Sieben (Principle 2) and Dr Sophie des Clers (Principle 3). The site visit for the assessment took place in Boulogne-sur-Mer, France from the 16<sup>th</sup> to 18<sup>th</sup> February 2015.

FROM Nord is a PO based in Boulogne-sur-mer, France, and the vessels in the Unit of Certification (UoC) are those sole trammel net vessels who are members of FROM Nord. As of February 2016, this included 84 vessels of 5-18m (mainly ~10-12m). The fishery operates in ICES divisions IVc and VIIId (southern North Sea and eastern Channel) – i.e. two stocks of sole (VIIId and IV) are involved, with the majority of quota and landings on the VIIId stock (~80%). Fishing for sole takes place throughout most of the year, although the optimal fishing season is from February to April. 2014 landings by the UoC were 1,256 tonnes in VIIId and 335 tonnes in IV.

The North Sea fishery operates on the basis of an EU multi-annual management plan for North Sea sole and plaice; for the VIIId sole there is no EU management plan and ICES give advice on the basis of the MSY framework. There is, however, a French management plan for the VIIId fishery which restricts effort and protected nursery areas. The status of both stocks is good ( $B > MSYB_{trigger}$ ) but for the VIIId stock,  $F$  has consistently been higher than  $F_{MSY}$  and for the last two years the TAC has been set higher than the ICES advice, based on  $F_{MSY}$ . The North Sea stock has recovered in recent years from previous overexploitation, with  $B$  now above  $MSYB_{trigger}$  and  $F$  slightly above  $F_{MSY}$ .

The trammel net fishery is a multispecies fishery, with most of the catch retained. Main retained species were identified as plaice (VIIId and IV stocks), dab, small-spotted catshark, cod and edible crab. No main bycatch species were identified. Both plaice stocks and the cod stock have a full analytic stock assessment; the plaice stocks are in good condition and the cod stock appears to be recovering following the cod recovery plan process. Dab and catshark are monitored based on survey CPUE and both species appear to be abundant and increasing. Edible crab are monitored by ICES WGCRAb, with most of the information in the Channel area from Ifremer monitoring of the larger crab fisheries in the Western Channel; again, LPUE appears to be increasing. In the North Sea the stock status is uncertain, but this fishery takes a small proportion of the total catch from this area in any case.

In terms of interactions with ETP species, birds, marine mammals (harbour porpoise and seals) and two species of shad were identified as of possible concern. Of these, the main concern is harbour porpoise. Ifremer have a cetacean bycatch monitoring programme for net fisheries in this area (FilManCet) and work with ICES WGBYC to evaluate impacts from bycatch; the evidence suggests that bycatch rates are well below levels which would be of concern for the population. EU Regulation 812/2004 requires that pingers are used on nets in VIIId – the fishery,

supported by Ifremer, has requested a derogation from this rule on the basis that the pingers are expensive, impractical and there is no evidence (from the FilManCet project) that they make any difference to bycatch rates. In relation to habitats, sole are known to prefer sand-type habitats. The main vulnerable habitat area is the 'ridens de Boulogne' area in the middle of the Channel which includes maerl beds; these are, however, part of a rocky reef area which is unsuitable for netting. Various protected areas are designated in the area of the fishery, as well as a marine park, but there is a low probability that their key features will be impacted by this fishery. The team also concluded that ecosystem impacts are unlikely.

The fishery operates on EU stocks, managed under the CFP. A TAC is set for both stocks, which is distributed on the basis of relative stability to each member state (France having much of the VIId TAC but a low proportion of the IV TAC). Within France, quota is allocated to and managed by POs based on the track record of their members. FROM Nord distributes its sole quotas via individual vessel allocations. The Comités Régionaux de Pêche are the licensing organisations. Enforcement is the responsibility of départemental and regional fisheries management authorities at local level, while at national level (e.g. monitoring of VMS and allocation of resources based on risk) it is dealt with by the Centre National de Surveillance des Pêches; these organisations work closely together. The system appears to work well and provide effective deterrence.

Strengths of the fishery's operation include a well-organised fleet which has strong co-management institutions based in Boulogne-sur-Mer. These organise the market and fishing activities, as well as promoting research and conservation measures and foster good conduct and compliance. A weakness of the fishery is that it consists of mostly small-scale operators, whose profitability may be highly impacted by the current fluctuations of the Eastern Channel (Vid) stock.

The overall preliminary scores for each Principle are as follows: Principle 1: IV sole – 89.4 and VIId sole – 81.9, Principle 2: 82.7 and Principle 3: 92.3. No PI scored <60. Two PIs scored <80 – PI 1.2.1 and 1.2.2 for the VIId stock. There are therefore two conditions as follows:

- The actions necessary to achieve the stated long-term (MSY) objectives for the VIId sole stock need to be clearly defined via a management plan or by some other suitable method, in order to provide evidence that the harvest strategy can achieve its objectives (SG80 scoring issue b).
- Controls on the exploitation rate should be better aligned with the status of the VIId sole stock, and there need to be defined biomass and fishing mortality management targets that are mutually consistent, in order to provide evidence that the tools in use are effective in achieving the exploitation levels required under the harvest control rules (SG80 scoring issue c).

Since each Principle has been scored at above 80 and no single PIs scored below 60 the fishery is being provisionally recommended for certification.

## Résumé Exécutif

MEC présente dans ce Rapport Final pour la pêcherie FROM Nord de sole par filet trémail en Mer du Nord et en Manche Est. FROM Nord est une organisation producteur, basée à Boulogne-sur-Mer, France, dont les navires membres ciblant la sole par filet trémail font partie de l'unité de certification (UoC). En février 2016, il s'agit de 84 bateaux de 5 à 18m (10-12 m pour la plupart). La pêcherie se réalise dans les Divisions CIEM IVc et VIIId (Mer du Nord du sud, Manche est) – c'est-à-dire, sur deux stocks de sole (VIIId et IV). La plupart du quota et des captures s'applique sur le stock VIIId (~80%). La pêcherie est optimale de février à avril, mais a lieu pendant toute l'année. Les captures de 2014 sont 1,256 t (VIIId) et 335 t (IV).

La gestion de la pêcherie Mer du Nord est basée sur un plan de gestion pluriannuel pour la sole et le plie ; pour la pêcherie VIIId, il n'y a aucun plan européen, et CIEM donne son avis par référence au cadre de gestion 'MSY'. Il existe, cependant, un plan de gestion français pour VIIId, qui limite l'effort de pêche et protège les zones nourricières. L'état de chaque stock est bon selon les points de référence biomasse ( $B > MSYB_{trigger}$ ), sauf que pour le stock VIIId,  $F$  est toujours au-dessus du niveau  $F_{MSY}$ , et pour 2014 et 2015, le TAC établi était au-dessus de l'avis de CIEM. Le stock Mer du Nord se montre ré-établi après une période de surexploitation, bien que  $F$  reste un petit peu au-dessus de  $F_{MSY}$ .

La pêcherie filet trémail est une pêcherie multi-espèces, et la plupart des captures sont retenues. Les espèces retenues '*main / principales*' étaient identifiées comme : plie (stocks VIIId et IV), limande, roussette, cabillaud et tourteau. Aucune espèce '*principale*' rejetée n'était identifiée. Les stocks de plie ainsi de cabillaud sont évalués par CIEM de façon détaillé et quantitatif, et sont soit en bon état (plie) soit en ré-établissement (cabillaud). Les stocks de limande et de roussette sont suivis par les résultats de suivis de recherche, et se montrent aussi en augmentation. Le tourteau est suivi par Ifremer (pour la plupart dans la Manche ouest où les pêcheries de tourteau sont beaucoup plus importantes) ; les données montrent aussi une augmentation graduelle de CPUE. L'état du stock (des stocks) de tourteau dans la Mer du Nord est peu connu, mais cette pêcherie ne représente qu'une partie négligeable des captures de tourteau dans cette région.

Pour les interactions avec les espèces 'ETP' (protégées), les interactions avec les oiseaux, mammifères marins (marsouins et phoques) et deux espèces d'aloise étaient examinées. Le plus préoccupant était les marsouins. Ifremer dirige un programme de suivi pour les prises de cétacées dans les pêcheries filets dans cette zone (FilManCet), et travaille avec CIEM (WGBYC) pour faire des évaluations des impacts via des prises accessoires. Ils estiment que le taux des interactions est bien au-dessous d'un niveau qui serait préoccupant pour la population. L'UE (Régulation 812/2004) exige l'installation des 'pingers' sur les filets dans la zone VIIId – mais la pêcherie, avec le soutien d'Ifremer, a demandé une dérogation, basé sur les faits que : i) ils sont cher ; ii) il ne sont pas pratiques et iii) il n'existe pas d'évidence (selon FilManCet) qu'ils marchent.

Pour les habitats, la sole préfère les habitats sablés. La zone des habitats vulnérables la plus importante dans la zone de la pêche est le 'ridens de Boulogne' au milieu de la Manche ; une zone rocheuse avec les lits de maerl – la zone ne peut pas, cependant, être pêchée par filet, étant trop rugueuse. Plusieurs aires protégées sont délimitées dans la zone de pêche, ainsi qu'un parc marin, mais il est peu probable que leurs éléments clés sont impactés par cette pêche. Les impacts au niveau de l'écosystème ne sont aussi pas probables.

Les stocks sont partagés au niveau UE, et donc la gestion est sous le cadre PCP (Politique Commune de Pêches). Un TAC est établi chaque année pour chaque stock de sole, et distribué à chaque Etat Membre sur la base de 'stabilité relatif' (la France a donc la majorité du quota VIId mais une petite proportion du quota IV). En France, les quotas sont distribués par le gouvernement aux OPs selon l'histoire des captures de leurs membres. FROM Nord ainsi fait une distribution de leurs quotas aux bateaux individuels, aussi selon leurs antécédents. Les licences viennent des Comités Régionaux de Pêche. Surveillance et contrôle de pêche sont sous la responsabilité des organisations départementales et régionales (DDTM et DIRM) au niveau local, et sous le Centre National de Surveillance des Pêches au niveau national (par ex. gestion de VMS, plans de contrôle basés sur une analyse de risque) ; ces organisations travaillent étroitement ensemble.

Les scores préliminaires pour chaque Principe sont: Principe 1: IV sole – 89.4 and VIId sole – 81.9, Principe 2: 82.7, Principe 3: 92.3. Aucun IP n'a été noté <60. Deux IPs ont été noté <80 – IPs 1.2.1 et 1.2.2 pour le stock VIId. Deux conditions sont donc proposées, comme suite:

- Les actions requises pour achever les objectifs long-terme (MSY) pour le stock sole VIId doivent être bien défini via un plan de gestion ou par une autre méthode agréée, pour pouvoir montrer que la stratégie de gestion peut achever ces objectifs (SG80, point b).
- Les contrôles sur le taux d'exploitation pour le stock sole VIId doivent être mieux alignés avec l'état du stock, et les objectifs de gestion en termes de biomasse et de mortalité de pêche (MSYBtrigger, FMSY) doivent être mutuellement compatibles, pour pouvoir montrer que les outils de gestion sont efficaces pour pouvoir achever le taux d'exploitation requis sous le règle de contrôle des captures (SG80, point c).

Étant donné que chaque principe a été marqué au-dessus de 80 et pas un seul IP était marqué en dessous de 60, la pêche est recommandée à titre provisoire pour la certification.

## 1. Authorship and Peer Reviewers

The authors of this report (MEC assessment team) are:

**Dr Jo Gascoigne (Team Leader):** Dr Gascoigne is a former research lecturer in marine biology at Bangor University, Wales. She is a fully qualified MSC Team Leader with expertise in the assessment of all MSC Principles. She has been involved as expert and lead auditor in all of MEC's previous MSC assessments and numerous pre-assessments. For this assessment, Dr. Gascoigne was the team leader.

**Dr Mike Pawson:** Dr Pawson has 44 years experience as a fisheries scientist carrying out biological research and providing expert advice, particularly in relation to fish stock assessment and fisheries management and regulation. In 2007 he retired from his post as the senior advisor to the English Department of Environment, Food and Rural Affairs on salmonid and freshwater fisheries, and marine inshore fisheries, but continued to be responsible for the scientific direction of a number of related research projects at Cefas, Lowestoft, and acts as scientific consultant for other organisations. During this full assessment he was in charge of Principle 1.

**Chrissie Sieben:** Chrissie Sieben has a Master's Degree in Marine Environmental Protection, which she obtained at the University of Wales, Bangor. She is MSC fisheries manager at MEC and specialises in marine and fisheries ecology, marine environmental impact assessment and sustainable fisheries. As a fully qualified MSC assessment team member she is involved in MSC pre and full assessments and fishery surveillance audits and participates regularly in MSC CAB training sessions and workshops. During this full assessment she was in charge of Principle 2.

**Dr Sophie des Clers:** Dr des Clers is an independent consultant, specialising in economic and social aspects of fisheries management. She has collaborated to numerous MSC assessments since 2008. Sophie is an expert in fisheries public policy, management systems and legislation at international, regional and national levels, with particular focus on the EU. During this full assessment she was in charge of Principle 3.

The peer reviewers for this report are:

**Dr Robert Blythe-Skyrme:** Rob started his professional career in finfish mariculture in 1996, before switching to a focus on the science, management and policy of wild fisheries. Following his PhD, which considered biological and socio-economic aspects of an inshore shellfish fishery, he worked as the Senior Environment Officer and then Deputy Chief Fishery Officer at the Eastern Sea Fisheries Joint Committee, the largest regional fisheries management organization in England. Rob then became Natural England's senior advisor to the UK Government on marine fisheries and environmental issues, leading a team dealing with fisheries policy, science and nationally significant fisheries casework. Since the end of 2008, Rob has run

Ichthys Marine Ecological Consulting Ltd., a consultancy providing marine fisheries and environmental advice to a variety of governmental and industry clients. Rob has undertaken all facets of MSC work as a Lead Assessor, expert team member and peer reviewer, across varied fisheries including those for Alaska pollock, Pacific cod, Atlantic cod, Pacific salmon, albacore tuna, yellowtail flounder, Arctic surfclam, American lobster, pink shrimp, Japanese scallop, sea scallop and blue mussels.

**Prof. Jean-Claude Brêthes:** Jean-Claude has a PhD in Oceanology from the University of Aix-Marseille-II (France). He has been a professor for over 35 years, firstly at the in the Oceanography Department at the Université du Québec à Rimouski (UQAR) and since 1999 at the Institute of Marine Science Rimouski (ISMER). Outside of his professorship, Jean-Claude was the Vice-Chairman for the Fisheries Resource Conservation Council (FRCC) Canadian Advisory Board for the Ministers of Fisheries and Oceans from 1995 to 2001, where he provided recommendations for Atlantic groundfish conservation on Total Allowable Catches. In addition to this, he has also been a member for the Canadian Scientific Advisory Council Department of Fisheries and Oceans, Canadian Atlantic Fisheries Advisory Council and Quebec Aquaculture and Fisheries Council. More recently, Jean-Claude has acted a scientific expert for the assessment of Northern Gulf of St. Lawrence Snow Crab stocks. He has also chaired a number of workshops and regional advisory processes for the assessment of Canadian crustacean and demersal fish stocks. Internationally, he has worked in Mauritania, Madagascar, and Tunisia and on coastal fisheries in the Northern Mediterranean Sea. Jean-Claude has also taken part in a number of MSC assessments including the Gulf of St. Lawrence Northern shrimp trawl fishery, Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster trap fishery and Euronor saithe fishery.

## 2. Description of the Fishery

### 2.1. Unit of Certification (UoC) and Scope of Certification Sought

MEC confirms that the fishery under assessment is in conformity with Principle 3, Criterion A1 and Principle 3, Criterion B14 of the MSC Certification Requirements v1.3:

- Criterion A1: A fishery shall not be conducted under a controversial unilateral exemption to an international agreement.
- Criterion B14: Fishing operations shall not use destructive fishing practices such as fishing with poisons or explosives.

Therefore, MEC concludes that the fishery is within the scope of the MSC certification process.

The 'unit of certification' (UoC) is the definition of the fishery under assessment, i.e. the target stock(s) combined with the fishing method/gear and practice (including vessel/s) pursuing that stock. The first act of the assessment was to define the UoC, of which there are two, as described in the following table:

**Table 1. Definition of the Units of Certification**

Species	Sole, common sole, Dover sole ( <i>Solea solea</i> )
Geographical range	UoC 1: ICES Division IVc UoC 2: ICES Division VIIId
Method of capture	Trammel net, filet trémail (GTR)
Stock	UoC 1: North Sea sole (IVc) UoC 2: Eastern Channel sole (VIIId)
Management System/s	EU common fisheries policy (IVc, VIIId), French management plan (VIIId)
Client group	FROM Nord member vessels fishing for North Sea sole in ICES Division IVc and Eastern Channel sole in Division VIIId using trammel nets. Vessels in the UoC as of February 2016 are given in Table 2
Other eligible fishers	None

#### 2.1.1. Scope of Assessment in Relation to Enhanced Fisheries

The MSC defines enhanced fisheries as follows: Any activity aimed at supplementing or sustaining the recruitment, or improving the survival and growth of one or more aquatic organisms, or at raising the total production or the production of selected elements of the fishery

beyond a level that is sustainable by natural processes. It may involve stocking, habitat modification, elimination of unwanted species, fertilisation or combinations of any of these practices (MSC Certification Requirements v1.3).

The fishery under assessment is a wild capture fishery and does not meet the above definition. This fishery is therefore not considered enhanced.

## 2.1.2. Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The MSC defines Introduced Species Based Fisheries (ISBF) as follows: Any fishery which prosecutes a target fin or shellfish species that was intentionally or accidentally transported and released by human activity into an aquatic environment beyond its natural distribution range. This does not include species that are “introduced” into a location due to an expansion in their natural geographic range (MSC Certification Requirements v1.3).

The fishery under assessment does not meet the above definition. This fishery is therefore not considered ISBF.

## 2.2. Overview of the fishery

### 2.2.1. History of the fishery and its management

Sole has been exploited in the eastern Channel and southern North Sea as a by-catch in demersal fisheries since the early 1900s. The modern targeted fishery for sole began in the 1960s with the introduction of large beam trawls, mainly by fishermen from the Netherlands. Traditionally sole fisheries were seasonal, starting in the spring as sole migrated inshore to spawn, continuing at a low level throughout the summer and increasing in the autumn before sole moved into deeper water to overwinter. The development of beam trawls with heavier tickler chains that disturb the buried fish allowed fisheries to extend throughout the year and enabled sole to be caught in both daylight and at night. Whilst the majority of sole landings are made by beam trawlers using 80 mm cod end nets in mixed fisheries with plaice, dab, turbot and brill (Cappell et al., 2012), sole are an important target species for many inshore fisheries, caught both by trawlers and in fixed nets, such as in this fishery.

### 2.2.2. Vessels

The average size of vessels in the fishery is just under 12m, with a few vessels longer. The vessels included in the Unit of Certification are given in Table 2.

**Table 2. Vessels in the UoC as of February 2016.**

Vessel name	Port	Reg. number	Length (m)	Owner
ENTRE LES 2 CAPS	Boulogne	562562	4.95	DUVAL Benoit
LE GALERIEN	Boulogne	697774	8.50	BAILLET Jean Jacques

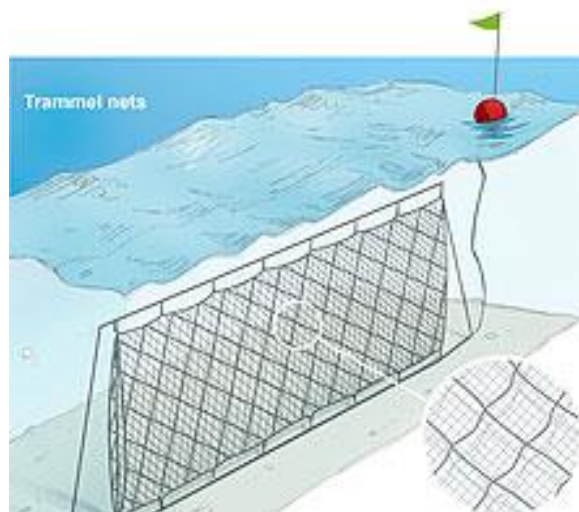
Vessel name	Port	Reg. number	Length (m)	Owner
BAROUDER DES MERS II	Boulogne	644766	9.73	DELSART Christine
NEREIDES	Boulogne	387200	9.73	DEVOGEL Jeremy
L'ESPIEGLE	Boulogne	275265	9.98	FAMCHON Yoann /SARL
NEPTUNE	Boulogne	714400	10.03	MALFOY Vincent
NOEMIE	Boulogne	644786	10.40	BRABANT Claude
MAREI JUNON	FECAMP	899830	10.65	DAMMAN Jean-Marie
SURCOUF	Boulogne	562974	10.74	NOEL Jean-Yves
SEVERINE MAGALI	Boulogne	642423	11.00	DEVIN Marilène
L'ESPOIR	Boulogne	463875	11.13	CAPPELLE Thierry
SAINTE BERNADETTE	Boulogne	712160	11.17	GILLON Michel
DROIT AU BUT	Boulogne	912369	11.22	DUCHEMIN Cédric
ASCENSION	Boulogne	734832	11.30	MALFOY Jérôme /SARL
QUENGOALEX	Boulogne	734863	11.30	CALON Tony
AMANDINE OCEANE	Boulogne	592342	11.33	FEQUET David
LA BRETONNE	Boulogne	644968	11.60	BAILLET Gaetan
SAINT JULES	Boulogne	734504	11.63	MAGNIER Armand
LUCKY	CAEN	528866	11.70	PEREE Aurelien
LE BATTANT	Boulogne	644630	11.72	LAPOTRE Johnny
L'OPTIMISTE	Boulogne	922261	11.82	MERLIN Christian
SAINT JEAN PIERRE	Boulogne	589306	11.90	DEPARIS Loïc
L'ILE MAURICE	Boulogne	663223	11.92	LEBREQUIER Gérald
LAURENT GEOFFREY	Boulogne	851751	11.92	EURL NOTRE DAME DE PARIS
L'OPHELIE	Boulogne	735420	11.93	PINTO José
LA MOMONE	Boulogne	735421	11.93	HAMY Pascal
CARLSEN 2	Boulogne	623026	11.95	BAILLET Stéphane
L'EPERVIER	Boulogne	562367	11.95	DEBORGER Pascal
LA MERE LOUISE	Boulogne	925622	11.95	GILLON Yvon
LA TENDRESSE	Boulogne	914098	11.95	CONDETTE François et Thierry
LE MEUCHK	Boulogne	714474	11.95	FRISCOURT Willy
LOIC II	Boulogne	851750	11.95	DEPARIS Jean-Pierre
MUREX	Boulogne	595005	11.95	BAHEU Jean Marie
PROVIDENCE	Boulogne	735379	11.95	SDF BAILLET FRERES
CAP AUX ANGES	Boulogne	924693	11.96	CASTILLE Jules
CORENTIN LUCAS	Boulogne	714691	11.96	DELSART Jonathan
JEREMY-FLORENT	Boulogne	900468	11.96	LHOMEL Christophe
MIRLOU IV	Boulogne	734637	11.96	MARTIN Josse
SAINTE CATHERINE	Boulogne	735021	11.96	GILLON Jonathan & José

Vessel name	Port	Reg. number	Length (m)	Owner
DON LUBI II	Boulogne	714507	11.97	PINTO Stéphane
EXOCET	Boulogne	714496	11.97	QUENEHEN Dominique
MAJEANDA	Boulogne	711604	11.97	LHEUREUX David
LADY CAMILLE	Boulogne	644629	11.97	DELSART Gaëtan
CAPRICE DES TEMPS II	Boulogne	924689	11.98	BAILLET Jean François
L'AUDREY	Boulogne	701741	11.98	DUCHEMIN Alexandre
SANSESIA	Boulogne	734928	11.98	EURL JOCELYN
VAGUE A L'AME	Boulogne	899849	11.98	LASQUELLEC Benoit
TRAFALGAR	Boulogne	598337	11.99	PINTO José/BAILLET Frères
L'OCEANE	Boulogne	626648	11.99	BARDEAUX Stéphane
CHARLES HONORINE	Boulogne	900452	12.08	DELPLACE Pascal
SAINT THOMAS	Boulogne	677504	14.60	MARCQ Christophe
FANIE-CLEMENT II	Boulogne	922065	15.40	DELEYE CAUCHOIS Sébastien
BRISE LAME	Boulogne	900462	16.50	FEUTRY Nicolas
MARINE CAMILLE	Cherbourg	716628	18.42	REGNIER Frédéric
SOLITAIRE I	Cherbourg	730702	15.95	REGNIER Frédéric
NEPTUNE III	Dieppe	912379	9.50	HOUET Yann
LA ROSE DES VENTS	Dieppe	743459	10.47	TERNOIS Christopher
MAJOR	Dieppe	436787	11.14	COTTRELLE Bruno
MON VIEUX EDMOND	Dieppe	373082	11.58	BYHET Emmanuel
MARYNE NATHALIE	Dieppe	749609	11.95	DANGER Pascal
NARVAL	Dieppe	667344	11.95	BYHET Jean Noël
P'TIT ROI	Dieppe	869884	11.95	CLAPISSON René
SOLEA	Dieppe	733525	11.98	HAGNERE Alexis /SAS PRIAL
HE POURQUOI PAS	Dunkerque	579255	11.23	DROGERYS Alexandre
MA GONDOLE	Dunkerque	815511	11.95	LA GONDOLE EURL
LAU-GRE	Dunkerque	624153	13.20	TURPIN David /SARL L'AU GRE
RAMBO II	Dunkerque	788630	14.78	NOWE Philippe & Franck & Grégory
NYROCA	Fecamp	627883	7.60	COLSENET J,F,
JACOPHE	Fecamp	506973	8.00	GENTILI Christophe
L'ESPADON	Fecamp	899317	9.50	LECLERC Ludovic
LA P'TITE MARYNE	Fecamp	899318	9.50	BOULIER Stéphane
ST PIERRE	Fecamp	147148	9.99	BURET & DUCARNE
LE VAGABOND	Fecamp	716706	11.03	HEUDEBOURG J.Cl et Ph.
L'BOUT MENTEUX	Fecamp	716980	11.91	LAVENU Jérôme
JOLIE BRISE	Fecamp	707819	11.96	MANTEY Stéphane
LIM-JUST	Fecamp	697915	11.96	MURY Frédéric

Vessel name	Port	Reg. number	Length (m)	Owner
P'TIT FREDO	Fecamp	716606	11.96	RESSE Laurent
BAPT'BENHOR	Fecamp	899310	11.97	LESEIGNEUR Christophe
LE BRISANT	Fecamp	716720	14.00	DALBERGUE Cyril
YODEMAE 2	Fecamp	690755	17.00	POURCHAUX Yannick
ELISE-LOUIS	Le Havre	928984	8.52	HEBERT David
RISQUE TOUT	Le Havre	571203	9.10	HEBERT Roland
ANAÏS-EMILIE	Le Havre	716508	9.75	EVROT Nicolas
SAINT MARIN	Boulogne	721220	11.99	PRELOT David/EURL PRELOT

### 2.2.3. Gear and operation of the fishery

The trammel net ('trémail') used by this fleet (Figure 1) is a triple mesh net, anchored to the seabed with a total height of around 2m. By having an inner panel of small mesh netting, loosely hung between the two outer panels of large mesh netting, when a fish strikes the net it pushes the small-meshed netting forward through the large mesh, forming a pocket in which it is trapped. Trammel nets are set before dark, generally parallel to the tide. On a favourable tide, nets are lifted after a few hours (giving a better quality product), otherwise they are left overnight (when the sole are active) and hauled early in the morning.



**Figure 1. Schematic for trammel net gear.** Source: [http://www.coastalnets.co.uk/fishing\\_07.htm](http://www.coastalnets.co.uk/fishing_07.htm)

EU Regulation 850/98 requires for a mesh size of 90mm (for the small-mesh panel), with landings consisting of at least 70% sole. Although the main target species is sole, this fishery is a mixed fishery, and hence a larger mesh size (usually 100mm) might be used to target other species, with a bycatch of sole (details given below). The French management plan for eastern Channel area VIId (details given below) sets a maximum net length per vessel of 1 km per metre LOA of the vessel (i.e. a maximum of ~12 km for most of the vessels in the UoC); note

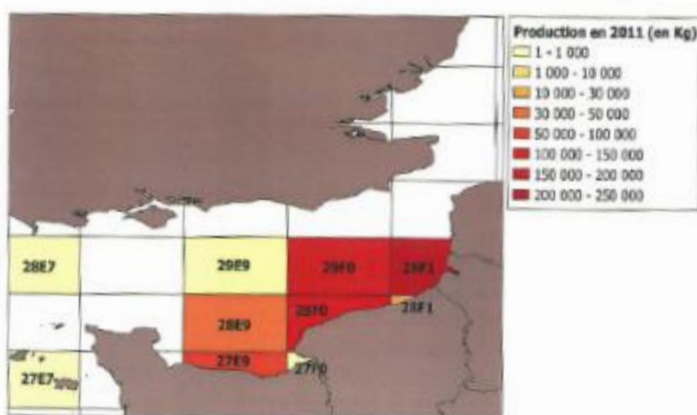
that in the southern North Sea area IVc there is no such limit. The total length of net deployed depends on the season.

#### 2.2.4. Fishing areas and seasons

The fishery operates in ICES divisions IVc and VIId (southern North Sea and eastern Channel). The fishing activity of FROM Nord member vessels targeting sole with trammel nets is mapped at the scale of ICES statistical rectangles in Figure 2. The vessels operate in French waters between the Belgian border and Cherbourg, although some have historic rights that enable them to fish in UK and Belgian waters of IVc and VIId (outside 6 miles).

Note that Figure 3 appears to show a small amount of effort in the western Channel (28E7 and 27E7), the boundary of VIIe extending northwards from the Cotentin peninsula. This concerns one UoC member vessel based at St Vaast and landing into the auction at Cherbourg. FROM Nord staff believe that this vessel only fishes in the Baie de Seine (east Cotentin – i.e. VIId) and that the effort in VIIe is a data entry error.

Fishing for sole takes place throughout most of the year, although the optimal fishing season is from February to April. This method of fishing is easily disrupted by poor weather during this period, which according to members of FROM Nord is one of the reasons why the TAC is often not caught in full. Fishing is done in short overnight trips (usually ~12 hours).



**Figure 2. Sole netting activity of FROM Nord member vessels licensed by the CRPM Haute Normandie in 2011 (see text for comment re 28E7 and 27E7) Source : CRPM Haute Normandie**

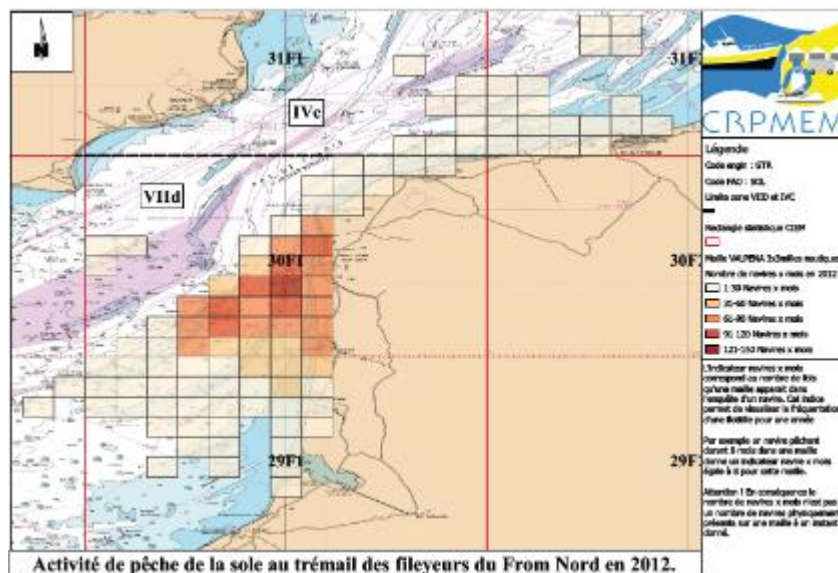


Figure 3. Sole netting activity of FROM Nord member vessels licensed by the CRPM Nord Pas de Calais Picardie in 2012. Source: CRPM Nord Pas de Calais Picardie

## 2.2.5. Total Allowable Catch (TAC) and Catch Data

The TAC, UoC quota and UoC catch for the most recent completed year is given in Table 3, with the two stocks given separately.

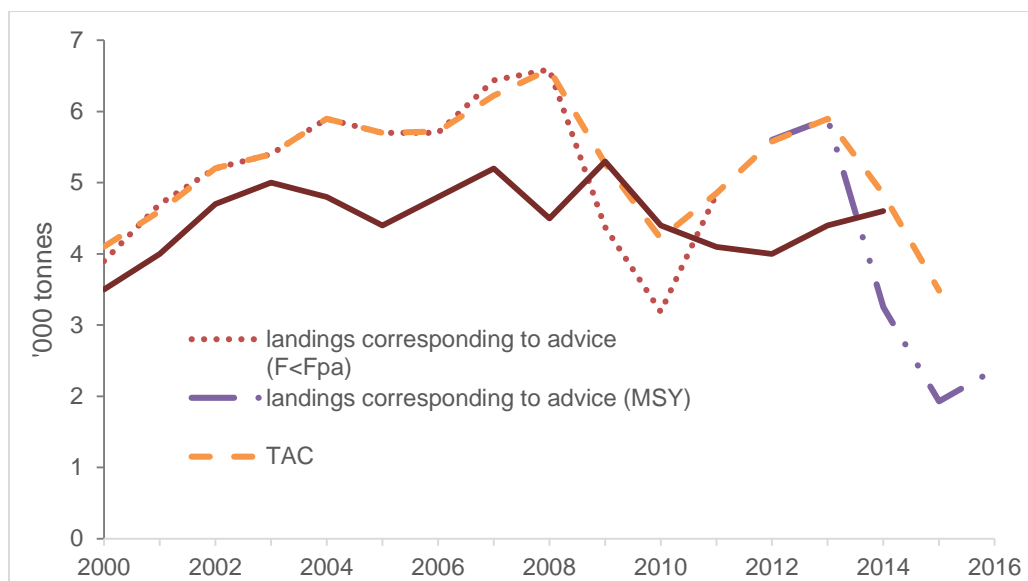
Table 3. Sole TAC and Catch Data for ICES fishing divisions VIId and IV for 2014

TAC VIId Sole	2014	4,838 t
UoC share of total TAC	2014	1,900 t
Total green weight catch by UoC	2014	1,256 t
	2013	1,427 t

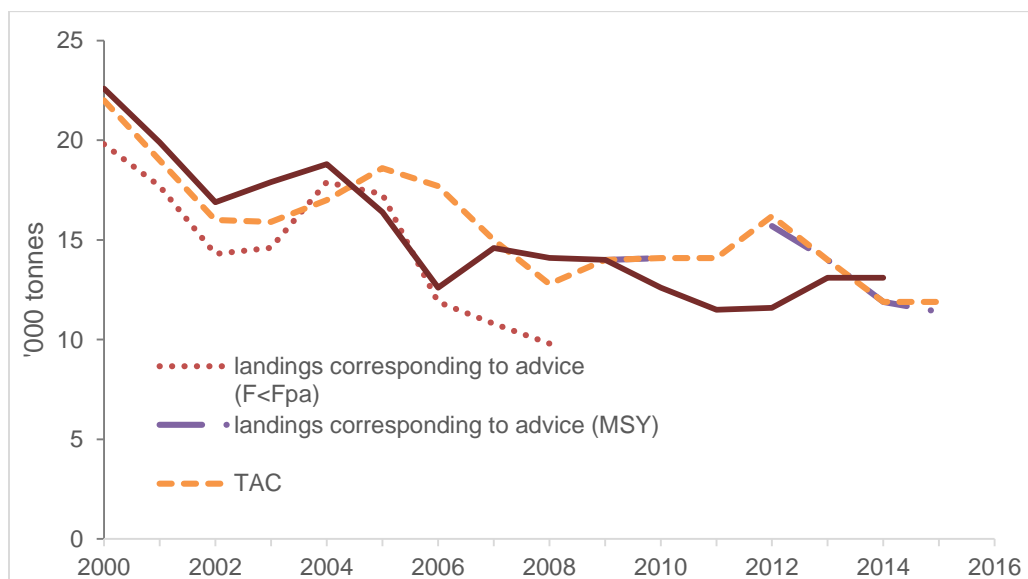
TAC IV Sole	2014	11,920 t
UoC share of total TAC	2014	464 t
Total green weight catch by UoC	2014	335 t
	2013	334 t

Landings corresponding to the scientific advice, TACs and total landings are shown in Figure 4 (VIId) and Figure 5 (IV). For VIId, the TAC has been set according to ICES advice, except for the implementation of a TAC constraint (see below); landings have consistently undershot the TAC except for years where the TAC has been significantly reduced.



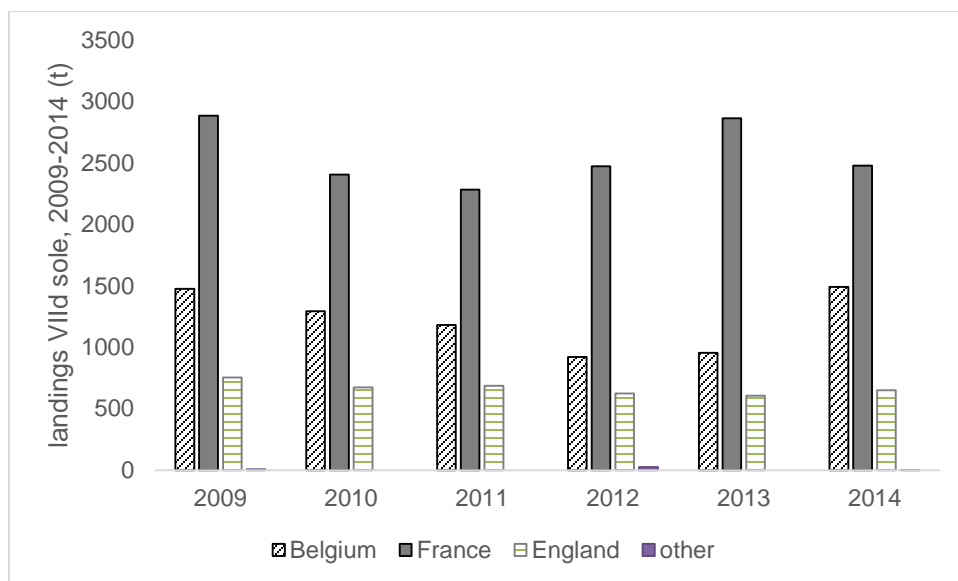
**Figure 4. Sole eastern Channel VIId stock - landings corresponding to ICES advice (precautionary framework  $F < F_{pa}$  and MSY framework), TAC and landings (solid line) ('000 t). Source: ICES, 2015a.**

For the North Sea (IV), the TAC has been set consistently in accordance with scientific advice since 2009 and again, landings have tended to undershoot the TAC.



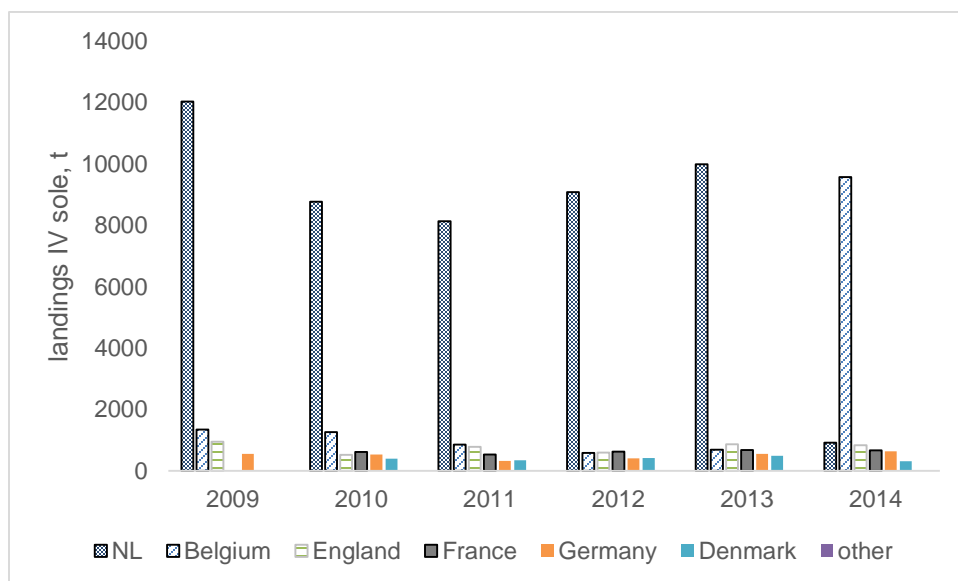
**Figure 5. Sole North Sea IV stock - landings corresponding to ICES advice (precautionary framework:  $F < F_{pa}$ , MSY framework), TAC and landings (solid line) ('000 t). Source: ICES, 2015b.**

Landings by country are shown in Figure 6 (VIId) and Figure 7 (IV). For fishing area VIId, of all EU member states, France lands the majority of sole (58% on average 2009-2014).



**Figure 6. Landings by country, Vllid sole (from ICES, 2015a). Note: 2014 landings data are provisional**

The picture is very different in the North Sea (IV) fishery, which is predominately a beam-trawl fishery, dominated by Dutch landings (or in 2014, Belgian landings – it may be that vessels have changed flag; the assessment team does not know the details). French landings, 335 tonnes in 2014, account for ~5% of the total North Sea sole landings.



**Figure 7. Landings by country, North Sea (IV) sole (from ICES, 2015b). Note: 2014 landings data are provisional.**

The total quota allocation and landings of FROM Nord vessels for 2012-14 are given in Table 4. Note that the quota allocation includes IV and Vllid. The proportion of quota and landings in each ICES Division is given in Table 5. About 300-400 t of the quota is taken by trawlers (also members of FROM Nord), the rest (~85%) is for the netters.

**Table 4. Quota allocation and landings of FROM Nord member vessels, 2012-2014 (t).**

Year	2012	2013	2014
Quota	2,501	2,687	2,364
Landings	1,580	1,761	1,591

**Table 5. Landings from each ICES Division and proportions, from logbook data for FROM Nord vessels, 2014 (t).**

ICES fishing area	sole quota FROM Nord 2014 (t)	sole landings FROM Nord 2014 (t)	% FROM Nord sole landings by area 2014	% of quota used
VIIId	1,900	1,256	79%	66%
IVc	464	335	21%	72%
Total (t))	2,364	1,591	100%	

## 2.2.6. Fisheries Management framework

### 2.2.6.1. Institutions

The fishery targets two European shared stocks of sole in the eastern Channel (VIIId) and southern North Sea (IV), which are managed under the recently revised European Common Fisheries Policy (CFP). At EU level, the European Commission drafts fisheries management legislation with stakeholders input from regional Advisory Councils (North Western Waters NWWAC for area VIIId and North Sea NSAC for area IVc). The Council of European (Fisheries) Ministers and European Parliament are joint law-making bodies. Within the EU Commission, the Directorate General (DG) for Maritime Affairs and Fisheries manages the Common Fisheries Policy (CFP) policy and the integrated maritime policy areas. Finally, the European Fisheries Control Agency - EFCA supports regional implementation of the CFP.

The two stocks are assessed separately by ICES, the international body providing scientific management advice to the Commission and examined by STECF. Decisions on the overall Total Allowable Catch (TACs) for the two stocks are taken annually<sup>1</sup>. Annual TACs are divided into national quotas between EU member states, according to historical landing records when the quota system was introduced (1976 for North Sea sole).

According to the French fisheries management system, the national sole quota for fishing areas VIIId and IV are apportioned between Producer Organisations (POs) based on the combined track records of their members for each stock. Quota exchanges are permitted at national and

<sup>1</sup> Council Regulations (EU) No 2015/104 of 19 January 2015

international level, but in France the state remains the owner of fishing quota, so the sale of quota is not possible. POs are also charged by the EU to take measures to regulate the market<sup>2</sup> and some, such as limits on fishing days and daily catch limits per vessel, contribute to conservation objectives.

The French fisheries management system is a decentralised form of co-management. Fisheries management is the responsibility of the Marine Fisheries and Aquaculture Directorate (DPMA) of the Ministry for the Environment, Sustainable Development and Energy (MEDDE). A summary list of the French institutions involved in the FROM Nord sole fishery and their main tasks is given in Table 6. French Institutions involved in the FROM Nord Trammel sole fishery management system Table 6, with some additional detail in section 2.5.

**Table 6. French Institutions involved in the FROM Nord Trammel sole fishery management system**

French National level	
Direction des pêches maritimes et de l'Aquaculture (DPMA)	Ministère de l'Écologie, du Développement Durable et de l'Énergie: Technical Directorate of the Ministry responsible for implementation the EU Common Fisheries Policy Regulation.
FranceAgrimer	Public Agency in charge of data centralisation and publication, and market reports
Ifremer	National fisheries research organisation in charge of stock assessment contribution to ICES WG, scientific support for OSPAR and MSFD environmental objectives and programme of measures. Regional offices also deal with locally relevant issues.
Agence des Aires Marines Protégées (AAMP)	Marine Protected Areas Agency, supports designation and management of French MPAs including Natura2000, MPA networks and joint scientific and technical coordination for the EU MSFD with Ifremer; provides technical and financial support to Marine Parks
Muséum National d'Histoire Naturelle (MNHN)	Natural History Museum, in charge of biodiversity monitoring for Habitats and Birds Directives (Natura2000 network) and for Marine Strategy Framework Directive (MSFD)
Centre National de Surveillance des Pêches (CNSP)	Coordinates missions and logistics for national MCS programme and EU co-operation through Joint Deployment Plans

<sup>2</sup> Regulation (EU) No 1379/2013 of the European Parliament and the Council of 11 December 2013 on the common organisation of the markets in fishery and aquaculture products

Comité National des Pêches maritimes et des élevages marins (CNPM)	<p>In charge of:</p> <ul style="list-style-type: none"> <li>• Policy and regulatory recommendations for national-level licence and conservation measures</li> <li>• Licensing and other bylaws</li> <li>• Represents CRPMs NPCP, HN and BN at national level</li> <li>• Undertakes some scientific research projects</li> <li>• Obtains and provides expert advice to regional committees</li> </ul> <p>North Sea – Eastern Channel Committee working on VIId management propositions</p>
<b>French Sub-national 'région' level</b>	
Direction interrégionale de la mer Manche Est-Mer du Nord regions Nord (DIRM MEMN) – Pas-de-Calais, Picardie, Haute-Normandie et Basse-Normandie	<p>Under Ministère de l'Écologie, du Développement Durable et de l'Énergie. The DIRM 'Manche Est-Mer du Nord' represents the wider regional coastal jurisdiction. Regarding fisheries, it:</p> <ul style="list-style-type: none"> <li>• executes ministerial instructions and CFP measures.</li> <li>• scrutinises and endorses bylaws ('arrêtés') from CRPM proposals ('délibérations')</li> <li>• is in charge of coordinating enforcement on the quayside and at sea, and</li> <li>• is the competent authority for the EU MSFD.</li> </ul>
CROSS Gris-Nez (Manche Est – Pas de Calais)	<p>Centre régional opérationnel de surveillance et de sauvetage en mer. Under the DIRM (above), coordinates regional operations for fisheries Monitoring, Control and Surveillance (MCS)</p>
FROM Nord Producer Organisation (PO)	<p>Producer Organisation (PO) based in Boulogne, the FROM Nord represents interests of vessel owners for the management of fishing quota and the organisation of markets according to production and marketing plans (since 2013). Sits on CRPM Commission fileyeurs. FROM Nord is the client for this certification</p>
Comité Régional des Pêches Maritimes et des Elevages Marins (CRPM)	<p>Mostly Nord Pas de Calais (CRPM NPCP), also Haute Normandie and Basse Normandie for the southern ports used by this fleet as well as the western part of Subarea VIId. The Regional Committees through their netters 'Fileyeurs' Commissions, deliver fishing vessel licences, initiate (through 'deliberations') local management bylaws promulgated by the DIRM, data collection and research projects.</p>
<b>French sub-region level</b>	
Directions Départementales des Territoires et de la Mer – DDTM / Délégations à la Mer et au Littoral (DML)	<p>The local competent offices of the Ministère de l'Écologie, du Développement Durable et de l'Énergie are the DDTM/ DML in each 'département' (DML59, DML62, DML76). They are in charge of:</p> <ul style="list-style-type: none"> <li>• vessel registrations (commercial and sailing boats)</li> <li>• seamen registration and social security provisions,</li> <li>• implementation of maritime and fisheries (professional and recreational) regulations.</li> </ul>
Pôle Aquimer	<p>A Boulogne-based grouping of private and public enterprises, producers'</p>

	organisations and research and education companies in the seafood sector, aiming to foster innovation and create growth and employment, of which FROM Nord is a member.
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At local level, the fisheries committees CRPM Nord Pas de Calais Picardie (CRPM-NPCP), CRPM Haute Normandie (CRPM-HN) and CRPM Basse Normandie (CRPM-BN) deliver fishing licences to vessels involved in the fishery along the coast, and the FROM Nord PO manages market access and records quota uptake on behalf of the fishing rights holders, mostly vessel owner-skipper. The three CRPMs draft bylaws passed by the sub-national DIRM (Manche Est Mer du Nord – MEMN) and the PO manage EU quotas allocated by the DPMA who in turn report to the EU DG. The DDTM/DMLs (Nord: DML59, Pas de Calais: DML62, Seine Maritime: DML76) report to the DIRM.

#### 2.2.6.2. Fisheries management measures

There is an EU multi-annual management plan to reduce fishing mortality for sole (and plaice) in the North Sea<sup>3</sup> and one being developed for sole in the Western Channel<sup>4</sup>. In addition to EU TACs and regulations, France has specific technical measures in place for each stock. FROM Nord also has measures in place, agreed by its members, including weekend fishery closures, which are mainly for the purpose of managing the market so that the economic return on the quota is optimised as far as possible. More detail on management are given in section 2.5.

<sup>3</sup> Council Regulation (EC) No 676/2007 of 11 June 2007

<sup>4</sup> <http://www.nwwac.org> Opinions and Advice/Year 10/Advice on a Management Strategy for sole VIId – 19 June 2015.pdf

## 2.3. Principle One: Target Species Background

### 2.3.1. Key LTL species

Sole is not a 'key low trophic level' species, according to MSC's definition, so these provisions in the MSC Certification Requirements do not apply.

### 2.3.2. Stock identity

Ifremer have reviewed the existing data relating to stock identity for eastern Channel / North Sea sole, and conclude that export of larvae from the eastern Channel to the North Sea is limited by the location of spawning grounds and the vertical migratory behaviour of larvae, while juveniles and adults are relatively limited in their movements, although adults make short seasonal inshore/offshore migrations. They conclude that sole will most often spawn at the same or a nearby spawning ground to where they originated (Forest et al., 2005). Overall, therefore, the data suggest that adult sole in the eastern Channel are largely isolated from those in other regions. Conversely, sole from the southern North Sea may enter the Channel temporarily during the winter. Ifremer conclude, however, that there is most likely some export of larvae and juveniles from VIId to adjacent areas, and on this basis it is possible that the eastern Channel nurseries are important in maintaining recruitment to stocks of sole in both the eastern Channel and adjacent regions.

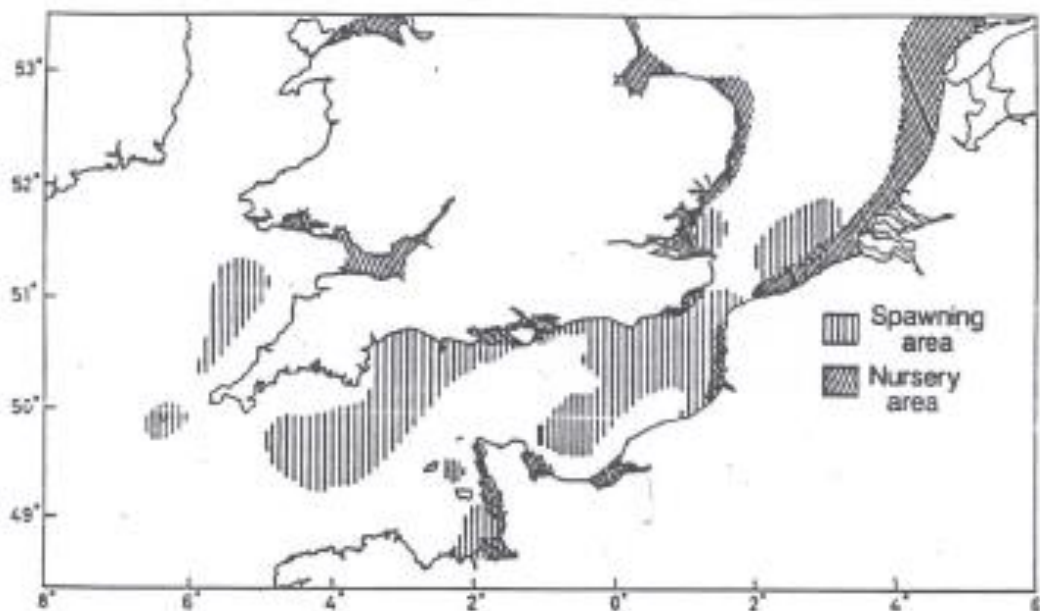
ICES treats sole in the eastern Channel (Division VIId) as a single stock for assessment and management purposes, and considers sole in the southern North Sea as part of the overall North Sea (ICES Sub-area IV) stock. This approach is supported by a population genetic analysis using neutral microsatellite markers and a mitochondrial marker showed genetic differences at a large scale, along a latitudinal gradient from the Skagerrak/Kattegat to the Bay of Biscay (Cuveliers et al., 2012). At a smaller spatial scale within the North Sea, however, the subpopulations seemed genetically homogeneous, probably due to a high level of gene flow and/or the high effective population size preventing strong effects of genetic drift.

### 2.3.3. Target species biology and ecology

The sole, *Solea solea*, is distributed in northeast Atlantic shelf waters between southern Norway and the Shetlands and Mauritania, but its main population range is from the central North Sea and Irish Sea south to the Bay of Biscay. In cold winters it withdraws to the deeper, warmer waters of the southern North Sea (for example), and large mortality of adult fish has been observed in extremely cold winters (e.g. 1963) if the water temperature drops below 3° C. However, very strong year classes have tended to occur after a cold winter, which suggests that there is an environmental impact on recruitment success (ICES, 2014a).

Sole spawning starts when the water temperature rises above 7°C, and occurs from late February until late June in the Channel and southern North Sea, although the peak spawning period is in April and May. In the eastern Channel, the highest egg concentrations have been

found in the Dover Strait, the Baie de Seine and around the Isle of Wight. The main spawning areas of sole are shown in Figure 8. There is an important spawning area in the Baie de Somme, though sole eggs are found widely distributed throughout the eastern Channel and spawning areas have been reported close to the English coast during April, centred between Beachy Head and the Isle of Wight, to the west of the Isle of Wight and in the vicinity of the Hurd Deep. There are several important sole spawning areas in the southern North Sea, in the Thames Estuary, Belgian coastal waters, Texel and Vlieland Grounds and part of the Heligoland Bight.



**Figure 8. Distribution of spawning grounds (vertical hatching) and nursery grounds (diagonal hatching) for sole in the Channel and southern North Sea. From Pawson 1995 cited in Forest et al., 2005).**

Sole eggs hatch approximately 8 days after fertilisation (depending on seawater temperatures) and the larvae are pelagic for up to 6 weeks. Larval transport to nursery areas appears to be governed by the larvae's behaviour and, on the basis of current movements, it is hypothesised that a proportion of larvae hatching in the eastern Channel may move east and recruit to nurseries in the southern North Sea.

Sole larvae recruit to shallow inshore nurseries at metamorphosis and, in estuaries, it has been suggested that this recruitment is an active process, which is determined by the salinity and temperature regime at the estuarine front. There are sole nurseries in estuaries, tidal inlets and shallow, sandy bays on the English and French Channel coasts and around the southern North Sea; see Figure 8 above). Marking studies suggest that sole are resident in these nurseries for at least 2 years after metamorphosis, moving offshore in the winter and migrating inshore again in the spring. Recruitment to the spawning population occurs as 2- or 3-year olds, and may involve emigration into adjacent sea areas. For example, tagging has shown that a proportion of sole released in the Baie de St Michel and the Baie de Seine moved to the English side of the

western Channel, and the seasonal distribution of returns suggested that this movement was permanent. In general, there appears to be a permanent emigration of around 10% of 3 and 4 year old sole from the eastern Channel to the southern North Sea and up to 30% to the western Channel. There is, however, no evidence of a significant immigration to the eastern Channel by sole tagged in the southern North Sea.

Sole undertake their most extensive migrations as maturing juveniles, and once fully mature, their movements appear to be relatively restricted, undertaking short seasonal migrations between deeper offshore areas and the shallower spawning grounds, with a return movement in the autumn. It is unlikely that a significant proportion of adult sole migrate from the Channel to adjacent seas, because sole appear to continue to use the spawning ground to which they first recruit. However, sole appear to move predominantly south through the Dover Strait in December, and it has been suggested that a proportion (~5%) of the population, which feeds and spawns in the southern North Sea, moves into the eastern Channel for the winter.

#### **2.3.4. Other fisheries on the stocks**

There are five main commercial fleets fishing for sole in the eastern Channel (Division VIId). Belgian and English offshore beam trawlers (> 300 HP) fish mainly for sole, but their landings can change considerably depending on whether the fleet moves to other areas or directs effort at other species such as scallops and cuttlefish. French offshore trawlers target roundfish and take sole as bycatch. Numerous inshore vessels (under 16m; many under 10m) on the English and French coasts target sole mainly in the spring and autumn, using mainly fixed nets, with sole forming their main source of income. Total sole landings in the eastern Channel in 2014 were 4,390 tonnes (t) comprising 35% beam trawls, 47% trammel/gill nets, 12% otter trawls, and 6% other gears (ICES, 2015a).

In the North Sea (essentially Divisions IVb and IVc) sole is mainly caught together with other species by the beam trawl fleet. An increasing proportion of the traditional beam trawl fleet is switching to SumWing and/or pulse trawl. Fishing effort by the beam trawl fleet has reduced by 65% in the last 15 years. Other directed fisheries for sole are carried out with gillnets and otter trawls. Bycatches of sole in other fisheries are small. Sole landings from the North Sea in 2013 were 13,100 t, comprising 86% beam trawl, 9% gill-/trammel nets, 2.2% otter trawl, and 2.4% other (ICES, 2015b). The combination of days-at-sea regulations, high oil prices, the constrained TAC for plaice (due to the 15% limitation in the multiannual plan), and the relatively stable TAC for sole have led to a tendency to fish more in the southern part of the North Sea, where sole has become relatively more abundant.

#### **2.3.5. Eastern Channel stock (ICES Division VIId)**

##### **2.3.5.1. Current stock status**

The output from the assessment conducted in 2015 is summarised in Figure 9 below (ICES, 2015a). Biomass is estimated to be approximately at the  $MSYB_{trigger}$  reference point, having

been above it for more than a decade. Fishing mortality, however, has also been systematically above both  $F_{MSY}$  (since the start of the time series) and the precautionary  $F$  reference point (since 2005), and in 2014 was estimated to be approximate equal to  $F_{lim}$ . ICES predict that  $F$  will increase, since the TAC was set at ~150% of the MSY level (ICES advice) in 2014, and 180% in 2015 (Figure 9).

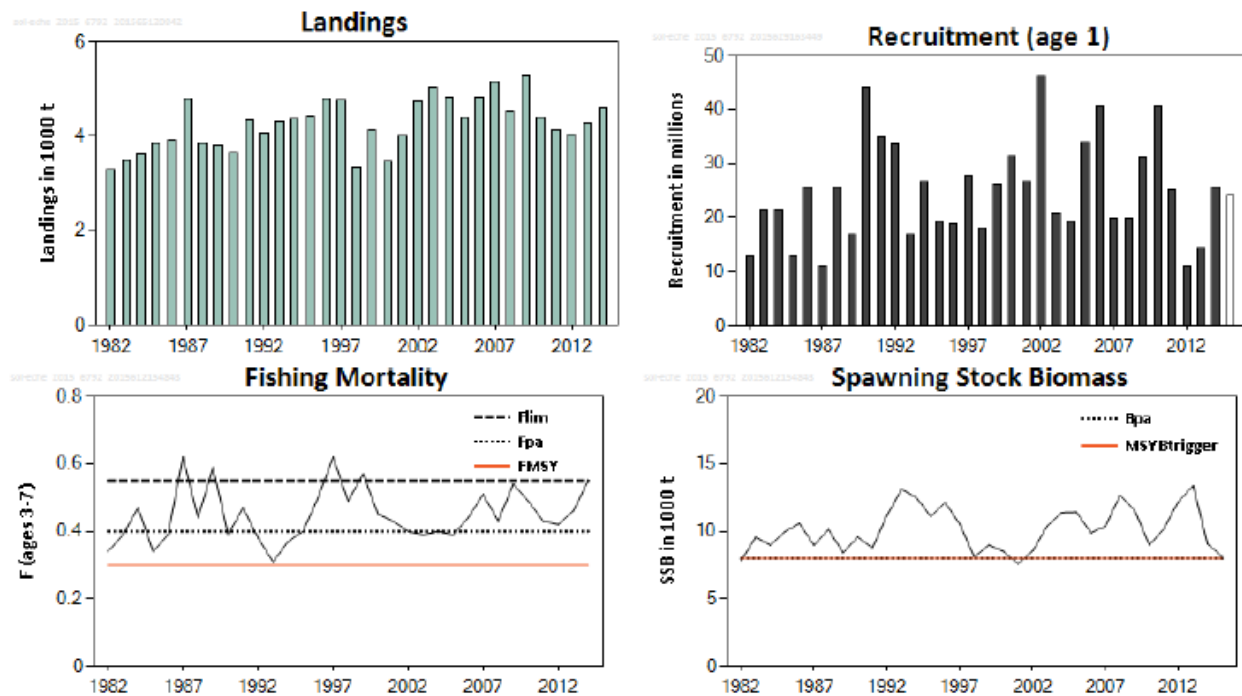
#### 2.3.5.2. Recruitment

There has been an overall increase in landings of sole from the eastern Channel since 1982, which reflects the trend in SSB (Figure 9) resulting from above-average recruitment (in 1990-1992, 2002, 2006 and 2010 for example). Recently, two year classes (2011 and 2012) are estimated to be the weakest in the time series. Fishing mortality ( $F$ ) has varied without a trend. The poorly defined stock-recruit relationship has been a problem in defining MSY reference points and evaluating stock status.

#### 2.3.5.3. Reference points

##### **Biomass reference points**

ICES derivation of reference points for VIId sole is summarised in Table 7 (see ICES (2015c) for the technical details; note stock annex not yet available at time of writing). Noting that there is no clear stock-recruitment relationship, ICES has not defined  $B_{lim}$  (the SSB level below which there is a raised probability of impaired recruitment), but has defined  $B_{pa}$  (the precautionary level of SSB that will ensure with a high probability that the stock remains above the level below which recruitment could be impaired) as the lowest SSB level observed in the assessment time series ( $B_{loss}$ ), and this has also been adopted as  $MSYB_{trigger}$ .



**Figure 9. Summary of ICES' stock assessment for sole in Division VIId (Eastern Channel) (landings and biomass in '000 tonnes). Assumed values are not shaded (source: ICES, 2015a).**

This definition of  $B_{pa}$  ( $MSYB_{trigger}$ ) is not consistent with many other assessments, including North Sea sole, but there is some logic behind this.  $B_{pa}$  was defined by ACFM (Advisory Committee on Fisheries Management) in 1998 (ICES 1998a), based on work done by WGNSSK in 1998 (ICES 1998b). WGNSSK (1998) initially evaluated  $B_{lim}$  for VIId sole as  $B_{loss}$  (7,800 t estimated at the time), but noted that the time series was short and that there was a low spread of values with which to define the stock-recruit relationship. ACFM accepted this approach for the majority of stocks, but in cases such as this, where recruitment on the SR plot appears to increase with decreasing biomass, and hence there appears to be a low risk of recruitment failure at biomass levels around  $B_{loss}$ , they used  $B_{loss}$  as a proxy for  $B_{pa}$  (rounded up to 8,000 t), and left  $B_{lim}$  undefined (ICES 1998a p.8). The rationale for this is consistent with other stocks; i.e. that adopting  $B_{loss}$  as  $B_{pa}$  should ensure with a high probability that the stock remains above the level below which recruitment could be impaired.

It is also important to note that in implementing the MSY approach, ICES have never intended that  $MSYB_{trigger}$  be considered as equivalent to  $B_{MSY}$ . ICES (2011) note: '*it [MSYB<sub>trigger</sub>] should be selected as a biomass that is encountered with low probability if  $F_{msy}$  is implemented. It was stated that if the SSB is below this level it is (by definition) out of expected range, and thus a suitable trigger to initiate action.*' They note, however, that in the long term it is not particularly logical to define  $MSYB_{trigger}$  based on  $B_{pa}$ , since  $B_{pa}$  is defined based on  $B_{lim}$ , while MSY reference points should be a function of the distribution of B under MSY exploitation. Nevertheless, this is the approach, which has been taken in the short term, lacking data to do differently (particularly, in this case, relating to the stock-recruit relationship).

## Fishing mortality reference points

Again, the precautionary  $F$  reference points were defined by ACFM, based on work done by WGNSSK (ICES 1998a,b). WGNSSK's estimates of  $F_{med}$ ,  $F_{lim}$  and  $F_{loss}$  are poorly defined (since they are based on a poorly-defined stock-recruit curve, see above), and ICES has since noted that  $F_{lim}$  is set at a more precautionary value than  $F_{loss}$ , based on the practice of relating precautionary and limit reference points by a factor of 1.4.

Reference points and their technical basis are given in Table 7.

**Table 7. Details of reference points for Vllid sole**

Type		Value	Technical basis
MSY approach	MSY $B_{trigger}$	8,000 t	$B_{pa}$ . A biomass level that should be rarely encountered when fishing at MSY – i.e. a trigger for management action (ICES, 2011).
	$F_{MSY}$	0.3	Stochastic simulations (using PLOTMSY) assuming a smooth hockey-stick stock-recruit relationship. Redefined from 0.29 to 0.3 in 2014 (ICES, 2015c).
Precautionary approach	$B_{pa}$	8,000 t	Lowest observed biomass at which there is no indication of impaired recruitment. Smoothed $B_{loss}$ .
	$B_{lim}$	Not defined	No biological basis for definition
	$F_{pa}$	0.4	Between $F_{med}$ and 5th percentile of $F_{loss}$ ; equilibrium $SSB > B_{pa}$ ; probability of $SSB < B_{pa} \sim 10\%$
	$F_{lim}$	0.55	$F_{loss}$ , but poorly defined; analogy to North Sea and setting of $1.4 F_{pa} = 0.55$ .

### 2.3.5.4. Harvest strategy and control rules

The Eastern Channel sole stock is managed via a TAC as well as technical measures. There is no formal management plan, but ICES provide advice based on the MSY approach (i.e. fishing the stock at  $F_{MSY}$  while maintaining biomass above  $MSYB_{trigger}$ ). This can be regarded as the basic harvest control rule.

For the past two years (2014 and 2015), the TAC has been set by the EU higher than the ICES advice – this also happened in 2009 and 2010 (Table 8). It appears (Table 8) that in setting the TAC, the EU Fisheries Council have been following a 20% inter-annual TAC constraint, although this is not formalised anywhere – with the exception of 2015 when they reduced the TAC by 28% relative to 2014, although this is still a considerably smaller reduction than the 60% reduction required to fish the stock at  $F_{MSY}$  in 2016.

**Table 8. % change in TAC relative to the previous year, % changed advised by ICES relative to the previous year's TAC; and ratio of TAC to advised landings, for VIId sole (information from ICES, 2015a).**

Year	%change in TAC relative to the previous year	%change in ICES advice relative to previous TAC	TAC/advice (%)
2009	-20	-34	120
2010	-20	-40	132
2011	+15	+15	100
2012	+15	+15	100
2013	+5.7	+5.7	100
2014	-18	-45	149
2015	-28	-60	180

Note that although the TAC has periodically been set above ICES advice, landings have consistently undershot the TAC (in every recent year aside from 2009, 2010 and 2014 – years when the TAC was cut significantly). FROM Nord members report that this is due to fishing effort being limited by weather conditions.

In 2015, responding to the reduction in TACs for Eastern Channel sole for 2014 and 2015 (and, presumably, 2016 if the harvest control rule is followed), France established its own management plan for the stock<sup>5</sup>. French landings have made up on average 58% of the total landings from this stock since 2009 – see Figure 6.

The French management plan, which applies to sole net and beam trawl fisheries, includes the following elements:

- Requirement for each vessel targeting this stock to have a 'national authorisation' for Eastern Channel sole, given if the vessel has a track record in 2011, 2012 or 2013;
- Total capacity of vessels with authorisations not to exceed the highest of 2011, 2012 and 2013;
- Total days at sea by vessels with authorisations not to exceed 14,742 (nets) and 3,555 (beam trawls) in 2015;
- Authorisation must be used each year to be renewed the following year;
- VMS a requirement of obtaining an authorisation, regardless of vessel size;
- A maximum net length of one km per metre LOA of fishing vessel;

<sup>5</sup> Arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêcherie de la sole commune (*Solea solea*) en Manche Est (division CIEM VIId)

- Some areas inshore closed to towed gears to protect sole nursery grounds and juvenile areas (Baie de Seine orientale, Nord Pas de Calais, and Picardie, see<sup>6</sup> for maps).

In relation to this last, one of the stakeholders (CRPM-Basse Normandie) are unhappy with how it has been implemented, because although nursery grounds have been identified by Ifremer all along the eastern Channel coast, they believe that the areas to be closed are disproportionately in the western part of the region (i.e. Normandy), with areas further east left open. Ifremer (Forest et al., 2005) also note that the density of juveniles in the eastern Channel is higher towards the east, suggesting that more emphasis could have been put on these nursery grounds rather than those further west.

#### 2.3.5.5. Information and assessment

The VIId sole stock was benchmarked in 2009. The ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) uses an age-based analytical (XSA) model to assess stock status of VIId sole (ICES, 2015c), which is in scientific data category 1 (includes stocks with full analytical assessments and several year classes contribute to the fishery). The assessment uses ages and length frequencies of sole in commercial catches, derived from catch sampling by metier (a fishery unit comprising a gear type that has a consistent catch composition by species and size structure), and abundance indices from two commercial metiers, Belgium and UK beam trawl, and from three surveys: UK beam-trawl survey, and UK and French young fish surveys (YFS), although the UK young fish survey was discontinued in 2007, much to ICES' dismay. The assessment assumes natural mortality to be constant, maturity-at-age to be knife edged at age 3 and a hockey-stick form of stock-recruit relationship (being the best fit to not-very-informative data).

Under reporting of catches and misreporting of sole caught in the western Channel (Division VIIe) into the eastern Channel (Division VIId) has been a problem in the past and the assessment has been corrected for this. In recent years, misreporting has been considered less of an issue. Estimation of recruitment has been less certain since the UK component of the YFS was halted in 2007. Discards were assumed to be negligible prior to the 2014 assessment, but preliminary information (2011-13) indicates discards may be in the region of 10%. In 2014, discards were estimated by ICES at 11.5%, and this has been factored into advice on landings since then (ICES, 2015a,c).

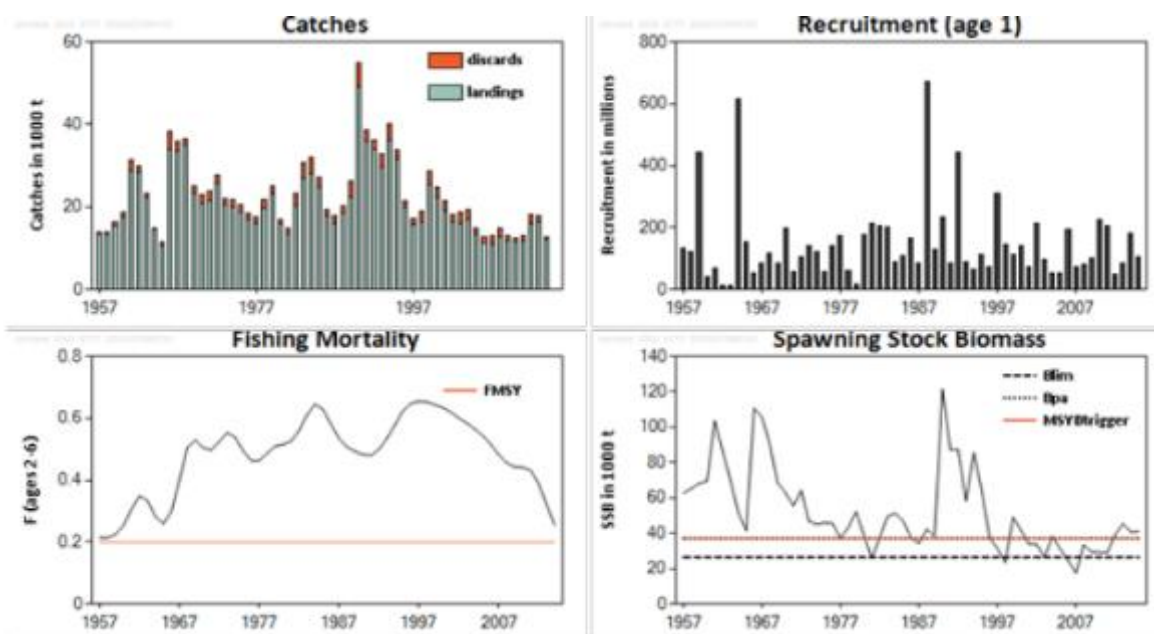
### 2.3.6. North Sea stock (IV)

#### 2.3.6.1. Stock status and recruitment

The output from the assessment conducted in 2015 is summarised in Figure 10. SSB is estimated to have fluctuated around  $MSYB_{trigger}$  since 1996, and has been just above  $MSYB_{trigger}$  since 2012, having recovered from dipping below  $B_{lim}$  in 2007. Fishing mortality has been declining consistently since the late 1990s, and is estimated to be slightly above  $F_{MSY}$  in 2014.

<sup>6</sup> pdf file of JO 1 Feb 2015 from <http://www.journal-officiel.gouv.fr/accueil.php>

There has been an overall decrease in landings of sole from the North Sea since 1990, which reflects the trends in SSB. The latter shows increases as a result of above-average recruitment (in 1959, 1964, 1988, 1992, 1997 and 2006 for example), though the underlying year-class strength throughout the time series has otherwise been relatively consistent.



**Figure 10. Summary of ICES' stock assessment for sole in Sub-area IV (North Sea). (weights in thousand tonnes). (source ICES, 2015b).**

#### 2.3.6.2. Reference points

ICES' derivation of reference points for IV sole is summarised in Table 9 (see ICES (2015d) for the technical details).

#### **Biomass reference points**

Noting that there is no clear stock-recruitment relationship, ICES had previously (ICES 1998a) defined  $B_{lim}$ , the SSB level below which there is a raised probability of impaired recruitment, as the lowest SSB level observed in the assessment time series ( $B_{loss} - 25,000$  t), and has set  $B_{pa}$  at a level of SSB that will ensure that the stock remains above that level with a high probability (a more orthodox approach than that taken for VIId sole, as noted above). The benchmark assessment in 2015 (ICES, 2015d), however, re-evaluated all the reference points. To re-estimate  $B_{lim}$ , ICES performed a segmented regression on the stock-recruit (SR) relationship and evaluated a breakpoint at 26,300 t (rather than 25,000 t); this has been adopted in the ICES (2015) advice as the new  $B_{lim}$  (ICES, 2015a). Given the usual relationship between  $B_{lim}$  and  $B_{pa}$  ( $B_{pa} = B_{lim} * 1.4$ ), this gives a value for  $B_{pa}$  of 37,000 t rather than 35,000 t.  $B_{pa}$  has been adopted as  $MSYB_{trigger}$ , lacking good enough data to evaluate MSY-based reference points directly. (Note - as discussed for VIId above - that  $MSYB_{trigger}$  is not a proxy for  $B_{MSY}$ , but is intended to

be a ‘trigger’ for management action.) However, the target (or trigger) biomass reference point set in the management plan remains 35,000 t, since the management plan has not yet been revised in the light of ICES’ new assessment.

### Fishing mortality reference points

$F_{MSY}$  was previously estimated at 0.22, and this is the value used for stage 2 of the management plan ( $F_{MP}$ ; details of the management plan given below). The 2015 benchmarking updated the analysis by WKMSYREF3 (ICES, 2014b) and produced a wide range of estimated values for  $F_{MSY}$  under different assumptions (form of stock-recruit relationship, including or not  $B_{trigger}$ ), most of which are considerably higher than 0.22 (precautionary range<sup>7</sup> with  $B_{trigger}$ : 0.28-0.45; without  $B_{trigger}$ : 0.26-0.39). They noted in particular that the form of the SR relationship has a big impact on the lower range of estimates of  $F_{MSY}$ : e.g. the values given above put 75% weighting on a Ricker curve and 25% on a segmented regression (hockey-stick curve); using just a segmented regression gives a precautionary range without  $B_{trigger}$  of 0.11-0.37. In other words,  $F_{MSY}$  is very uncertain.

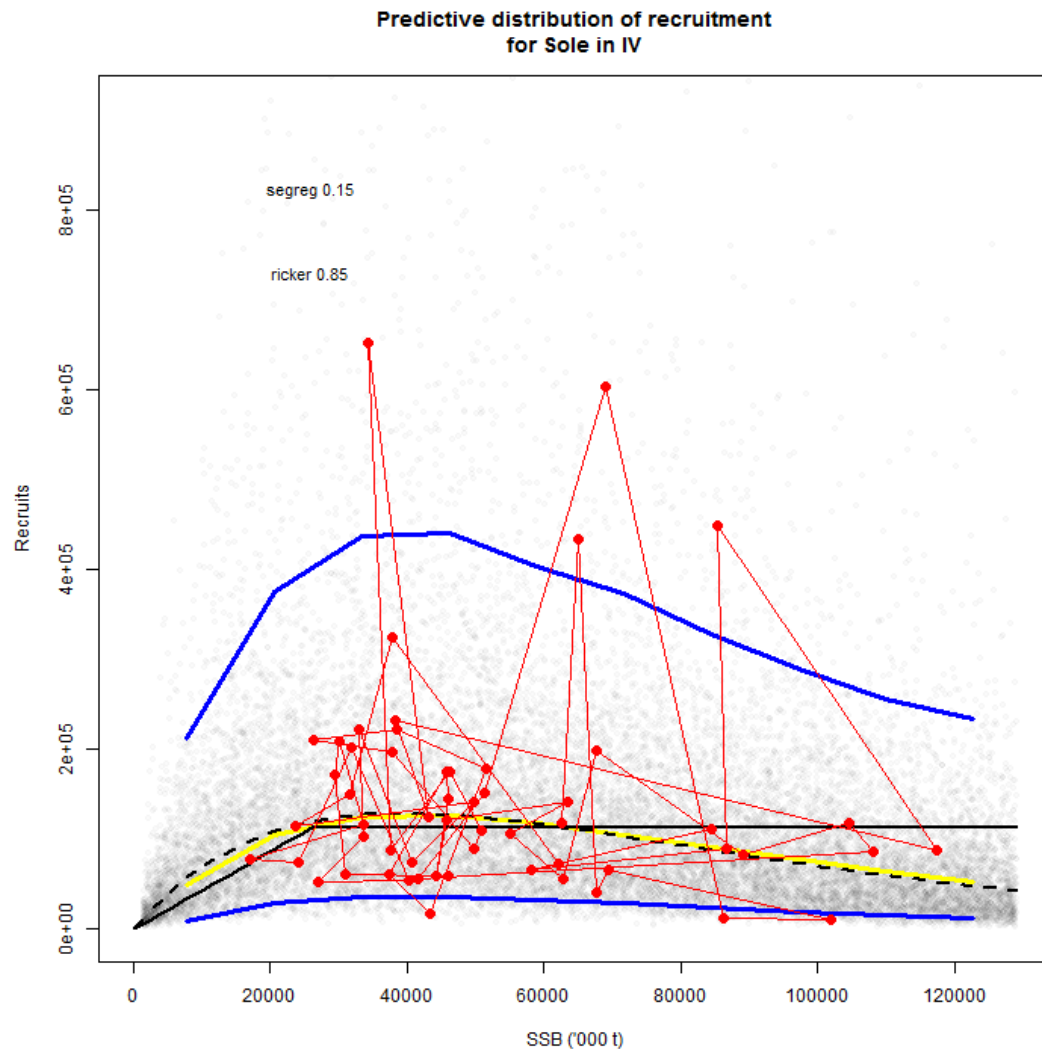
It is currently unclear how WGNSSK (ICES, 2015c) arrived at a value for  $F_{MSY}$  of 0.2 (a small reduction from the pre-benchmark / management plan value), given that both WKMSYREF3 (ICES, 2014b) and WKNSEA (ICES, 2015d) arrived at a range of estimates for  $F_{MSY}$ , which are mostly considerably higher than this. WGNSSK notes that the question of estimating  $F_{MSY}$  for this stock was considered further at a meeting of WKLIFE (the working group for the data-deficient stock framework) in March 2015, and this group proposed a range for  $F_{MSY}$  of 0.13-0.27, with median value 0.2. Unfortunately this report does not yet seem to be available.

**Table 9. Reference points for IV sole and their technical basis**

Type		Value	Technical basis
Management plan	SSB <sub>MP</sub>	35 000 t	Stage one: Article 2.
	$F_{MP}$	0.4 0.22	Stage one: Article 2; Stage two: Article 4.3 – $F_{MSY}$ .
MSY approach	MSY $B_{trigger}$	37 000 t	Default to value of $B_{pa}$ (NB: Revised by 2015 benchmarking from 35,000 t)
	$F_{MSY}$	0.2	Median of stochastic MSY analysis assuming a hockey-stick stock–recruit relationship (NB: revised from 0.22 – on what basis is unclear)
Precautionary approach	$B_{lim}$	26 300 t	Stock-recruit breakpoint regression (NB revised by 2015 benchmarking from 25,000 t – previously $B_{loss}$ )
	$B_{pa}$	37 000 t	$B_{pa}1.4 \times B_{lim}$ (revised as above from 35,000 t)

<sup>7</sup> precautionary range: upper bound set either at upper bound of estimates of  $F_{MSY}$  or at estimated value corresponding to a 5% risk of B dropping below  $B_{lim}$ , whichever is the lower

Type	Value	Technical basis
$F_{lim}$	Not defined	
$F_{pa}$	Not defined	



**Figure 11. North Sea sole stock-recruit relationship and segmented ('hockey-stick') regression used to estimate  $B_{lim}$  (black – regression line; blue – confidence intervals). From ICES, 2015d.**

#### 2.3.6.3. Harvest strategy and control rules

A multiannual plan for plaice and sole in the North Sea was adopted by the EU Council in 2007<sup>8</sup>, which has a recovery plan during its first stage and a long-term management plan during its second stage. The objective of stage one was to bring both sole and plaice stocks within safe

<sup>8</sup> Council Regulation (EC) No. 676/2007

biological limits, whilst stage two is intended to control exploitation of the stocks at a fishing mortality rate compatible with MSY. The plan provides for biomass and fishing mortality reference points as discussed above. It also requires effort limitations (kW-days per métier) to be adjusted in line with changes in fishing mortality. Various aspects of the plan have been reviewed several times (ICES, 2010; Coers et al., 2012; ICES, 2012a; STECF, 2014a) and it has been found to be consistent with the principle of exploitation at MSY, as well as the precautionary approach. In 2013, ICES also concluded that the effects of inter-annual quota flexibility (of 10% in terms of the probability of the stock biomass falling below  $B_{lim}$ , and average yield) in the management plan is robust, conditional on the inter-annual quota flexibility being suspended when the stock is estimated to be outside safe biological limits (ICES, 2013a).

Since the North Sea sole (and plaice) stocks have both been within safe biological limits in the last three years, the stocks are presently in stage two of the EU multiannual plan. This calls for management in line with the principles of MSY. In order to do this, ICES estimate the total catch obtained by fishing the stock at  $F_{MSY}$ , then subtract discards using the average discard rate of the last three years (2012-14). This is then landings or 'wanted catch' corresponding to ICES advice under the MSY approach, assuming that the stock is not yet subject to the landings obligation in 2016 (ICES, 2015b). A review of the management plan by STECF (STECF, 2014a) noted that the provisions of the management plan (TACs, effort limitations) have generally not been limiting to the fishery because of other factors (effort restrictions under the cod recovery plan, decommissioning, high fuel prices impacting the beam trawl fleet), but that the management plan has delivered stability in TACs for both species, which has been helpful, and may also have helped in avoiding large mismatches between sole and plaice TACs (which would potential result in increased discarding). In relation to the management of the stocks, STECF conclude: *'the harvest rules laid out in Art.7 and 8 to set fishing opportunities, have delivered  $F_s$  that are within the estimated  $F_{MSY}$  range for both stocks, and are thus compatible with the stage-two objective of exploiting both stocks at rates consistent with MSY'*.

Unlike for the VIlId sole stock, the North Sea TAC has been set more or less consistent with ICES advice since 2009. In 2015, ICES advised a reduction of 4.2% in the TAC compared to 2013, but the EU Fisheries Council decided to leave it unchanged, for reasons that are unclear (Table 10).

**Table 10. % change in TAC relative to the previous year, % changed advised by ICES relative to the previous year's TAC; and ratio of TAC to advised landings, for sole in Subarea IV (information from ICES, 2015b).**

Year	%change in TAC relative to the previous year	%change in ICES advice relative to previous TAC	TAC /advice (%)
2005	+9.4	+1.8	108
2006	-4.8	-36	149
2007	-15	-39	139
2008	-15	-35	131
2009	+9.4	+9.4	100

Year	%change in TAC relative to the previous year	%change in ICES advice relative to previous TAC	TAC /advice (%)
2010	+0.7	+0.7	100
2011	0	(quantitative advice not given)	
2012	+15	+11	103
2013	-13.6	-13.6	100
2014	-15	-15	100
2015	0	-4.2	104

#### 2.3.6.4. Information and stock assessment

This stock was benchmarked by WKNSEA in February 2015 (ICES, 2015d). WGNSSK has used an age-based analytical (XSA) model to assess the stock status, and WKNSEA noted that there are no particular issues with the model fit, and that an assessment with a SAM model (see ICES, 2014c) gave similar results despite a different model structure. The main purpose of the benchmark was therefore to improve the data used in the assessment, rather than to explore different assessment approaches. (Note that the same approach is also used for the VIId stock, which has not been benchmarked since 2009).

The assessment uses ages and length frequencies of sole in commercial catches, derived from catch sampling by metier, one commercial abundance index, Netherlands beam trawl, and three survey indices: BTS-ISIS Q3, SNS Q3, DFS Q3 Surveys, and assumes natural mortality to be constant and maturity at age to be knife edged at age 3. Discards are known to take place (approximately 20% by weight in recent years), but are not quantified for part of the fisheries (80% of the landings were covered in 2013). WKNSEA noted that, with the incoming landings obligation, it is important that discards are included in the assessment, and this was done for the first time in the advice provided for 2015 (ICES, 2015d).

## 2.4. Principle Two: Ecosystem Background

This section of the report outlines the fishery's potential impacts on the wider ecosystem. Five key components are considered to cover the range of potential ecosystem elements that may be impacted by the fishery. These are:

- (i) Retained, non-target species: species that are retained by the fishery (usually because they are commercially valuable or because they are required to be retained by management rules).
- (ii) Bycatch (discarded) species: organisms that have been taken incidentally and are not retained (usually because they have no commercial value).
- (iii) ETP species: Endangered Threatened or Protected species
- (iv) Habitats: the habitats within which the fishery operates
- (v) Ecosystem: broader ecosystem elements such as trophic structure and function, community composition, and biodiversity.

Under each of those five components, particular attention was paid to:

- (i) Outcome: the status of the impact or the risk that the fishery poses to that component.
- (ii) Management: the management strategy for the component.
- (iii) Information: the monitoring and information available to inform the outcome and management of the component.

### 2.4.1. Identifying 'main' retained and discarded species

MSC defines 'main' retained or bycatch species as those that either make up >5% of the catch, or which are particularly vulnerable to fishing pressure and/or valuable to the fishery.

The client provided logbook data for the UoC fleet, but it proved to include a considerable number of errors. Skippers have been receiving training with species ID materials in an attempt to improve the quality of logbook data (C. Radenne, FROM Nord, pers. comm.). The data are being validated by DPMA, but could not be made available in time for the assessment.

MEC therefore used information from the French national observer programme (ObsMer) to evaluate 'main' retained and bycatch species. A summary of the results of ObsMer, by métier, is available for 2011, 2012 and 2013 (Ifremer 2012, 2013 and 2015). The relevant métier for this fishery is fisheries in the eastern Channel and southern North Sea (divisions VIIId and IVc) targeting demersal fish with gillnets ('filets maillants calés' GNS) or trammel nets ('filets trémails' GTR). The fishery under assessment belongs to the second category. Although the data are presented across the whole métier (i.e. both net types, several target species), 80% or more of the fishing trips observed were for trammel nets targeting sole in each of the three years (2011 – 88.3%, 2012 – 87%, 2013 – 80.2%). For the purposes of this analysis, the team assumed that the quantity and species composition of the retained and discarded catch from the observations

of this métier corresponded to those in this fishery. This was verified by review of the 85 individual observer reports provided by the client, and no anomalies were found.

At sea scientific observer coverage (ObsMer) for the fileyeur métier is shown in Table 11.

**Table 11. ObsMer effort in the eastern Channel / North Sea demersal fish net fishery (Ifremer, 2012; 2013 and 2015).**

	Vessels			Days at sea		
	Total	Observed	% Observed	Total	Observed	% Observed
2011	151	46	30.5 %	17140	63	0.4 %
2012	171	49	28.7 %	19948	105	0.5 %
2013	175	50	28.6 %	20072	119	0.6 %

**Table 12. Summary of ObsMer data giving percentage of the total catch (retained + discarded) by species in observed trips for 2011, 2012 and 2013, for métier demersal fish netting in VIId and IVc. Species designated ‘main’ for the purposes of this assessment are highlighted in grey.**

Species		2011	% of Total catch		2012	% of Total catch		2013	% of Total catch	
		% Total catch	% Retained	% Discarded	% Total catch	% Retained	% Discarded	% Total catch	% Retained	% Discarded
Sole	<i>Solea solea</i>	20.8	20.3	0.5	23.3	22.8	0.5	36.3	35.5	0.8
Plaice	<i>Pleuronectes platessa</i>	18.4	13.7	4.7	31.5	27.4	4.1	19	12.3	6.7
Dab	<i>Limanda limanda</i>	7.5	3.7	3.8	5.2	2.9	2.3	9.2	5.4	3.8
Small-spotted catshark	<i>Scyliorhinus canicula</i>	7.3	7.2	0.1	7.7	7.6	0.1	4.4	4.3	0.1
Cod	<i>Gadus morhua</i>	7.2	6.9	0.3	7.7	7.6	0.1	2.8	2.8	0
Edible crab	<i>Cancer pagurus</i>	4.9	3	1.9	5.6	4.3	1.3	5.7	4.7	1
Common	<i>Sepia</i>	6.5	6.5	0	1.1	1.1		3.5	3.5	0

Species		2011	% of Total catch		2012	% of Total catch		2013	% of Total catch	
		% Total catch	% Retained	% Discarded	% Total catch	% Retained	% Discarded	% Total catch	% Retained	% Discarded
cuttlefish	<i>officinalis</i>									
European spider crab	<i>Maja squinado</i>	5.4	1.8	3.6	2.6	0.9	1.7	3.8	0.8	3
Turbot	<i>Scophthalmus maximus</i>	3.9	3.6	0.3	2.1	2	0.1		0	
Pouting	<i>Trisopterus luscus</i>	3.5	2.3	1.2	3.5	2.8	0.7	4.4	3.8	0.6
Seabass	<i>Dicentrarchus labrax</i>	2.4	2.4	0.0		0		0.3	0.3	0
Sand sole	<i>Pegusa lascaris</i>	1.5	1.5	0.0		0			0	
Blonde Ray	<i>Raja brachyura</i>				1	1		0.3	0.3	0
Starry smooth-hound	<i>Mustelus asterias</i>				0.9	0.8	0.1	1.1	0.4	0.7
Brill	<i>Scophthalmus rhombus</i>				0.9	0.8	0.1	0.5	0.5	0
Thornback ray	<i>Raja clavata</i>				0.8	0.6	0.2	1.1	0.9	0.2
Tub gurnard	<i>Chelidonichthys lucerna</i>				0.7	0.7			0	
Whiting	<i>Merlangius merlangus</i>				0.6	0.5	0.1	1	0.8	0.2
Mackerel	<i>Scomber</i>							0.5	0.4	0.1

Species		2011	% of Total catch		2012	% of Total catch		2013	% of Total catch	
		% Total catch	% Retained	% Discarded	% Total catch	% Retained	% Discarded	% Total catch	% Retained	% Discarded
	<i>scombrus</i>									
Lemon sole	<i>Microstomus kitt</i>							0.4	0.4	0
Undulate ray	<i>Raja undulata</i>							0.1	0	0.1
Horse mackerel	<i>Trachurus trachurus</i>							0.1	0.1	0
Spotted ray	<i>Raja montagui</i>							<0.1	<0.1	0

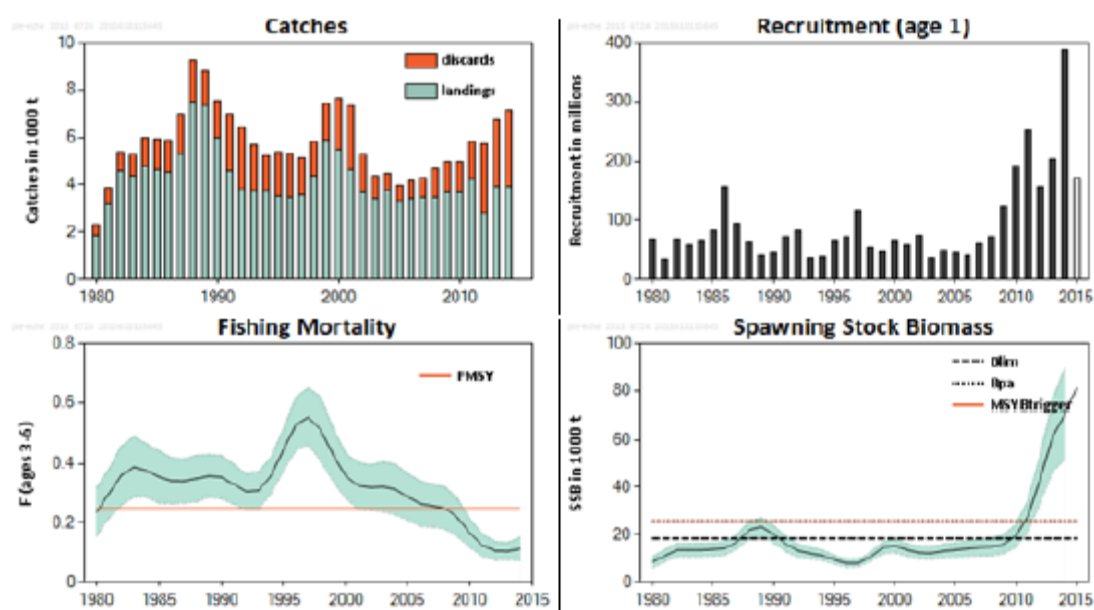
The ObsMer data are summarised for the three years in Table 12. The team decided to use the following decision rule to select 'main' species: *the species makes up 5% of the total catch or more in at least any two of the three years*. Species are designated retained if any part of the catch is habitually retained.

From Table 12, and following the decision rule as above, the 'main' retained / bycatch species are: plaice (two stocks –Eastern Channel and North Sea), dab, small-spotted catshark, cod and edible crab (may be two stock – see analysis below). No species were identified which are 100% discarded, so there are no 'bycatch' species, main or otherwise – they are all 'retained'.

## 2.4.2. Retained species

### 2.4.2.1. Eastern Channel plaice

ICES' assessment of the development of the Eastern Channel plaice stock over time is summarised in Figure 12. ICES note: '*Fishing mortality (F) has declined since the mid-1990s and is presently among the lowest in the time-series. Spawning-stock biomass (SSB) has increased since 2008 and is currently the historical high. Recruitment has strongly increased since 2010*' (ICES, 2015e). They conclude that the stock biomass is above the trigger reference point, fishing pressure is below all possible reference points and the stock is at full reproductive capacity (Figure 13).



**Figure 12. ICES' 2015 assessment of the eastern Channel plaice stock. Top left: catches (landings + discards), top right: estimated recruitment (2015 assumed as mean of time series); Bottom left: estimated fishing mortality relative to  $F_{MSY}$ ; bottom right: estimated SSB relative to  $B_{lim}$  (dashed line) and  $B_{pa} / MSYB_{trigger}$  (red dotted line). Source: ICES, 2015e.**

		Fishing pressure				Stock size			
		2012	2013	2014		2013	2014	2015	
Maximum Sustainable Yield	$F_{MSY}$	✓	✓	✓	Appropriate	MSY	✓	✓	Above trigger
Precautionary approach	$F_{pa}$ , $F_{lim}$	✓	✓	✓	Below possible reference points	$B_{pa}$ , $B_{lim}$	✓	✓	Full reproductive capacity
Management plan	$F_{MGT}$	-	-	-	Not applicable	$SSB_{MGT}$	-	-	Not applicable

**Figure 13. ICES' assessment of stock status relative to reference points for eastern Channel plaice (ICES, 2015e).**

In terms of management, ICES use the MSY approach framework (i.e. target  $F = F_{MSY}$ ) to provide advice. It is complicated to compare ICES advice for VIId plaice directly against the EU TAC, for several reasons: i) there is considerable discarding; ii) plaice from the western Channel stock (VIIe) come into VIId to spawn in the first quarter, and so form part of the landings from VIId during this period and iii) the EU TAC is set for VIId and VIIe together. Bearing this in mind, however, we have tried to evaluate whether management corresponds to ICES advice (Table 13). For 2013-15 it is possible to compare ICES advice for the two areas with the TAC set by the EU Fisheries Council; the TAC was set the same as the advice in 2013, but exceeded it by 21% in 2014 and 10% in 2015. In 2013, landings were only 80% of the TAC and advice; for the other years, it is not possible to evaluate (Table 13).

**Table 13. Comparison of landings corresponding to ICES advice, the EU TAC and ICES estimated landings for plaice in VIId and VIIe together, 2013-15.**

	landings corresponding to ICES advice (t)			EU TAC (VIId+e) (t)	TAC / advice (%)	ICES estimated landings (t)			landings / advice (%)
	VIId plaice	VIIe plaice	VIId + VIIe	VIId + VIIe		VIId	VIIe	VIId + VIIe	
2013	4300	2100	6400	6400	0	3600	1530	5130	-20 %
2014	3925	1397	4413	5322	+21 %	3700			
2015	2811	1546	4357	4787	+10 %				

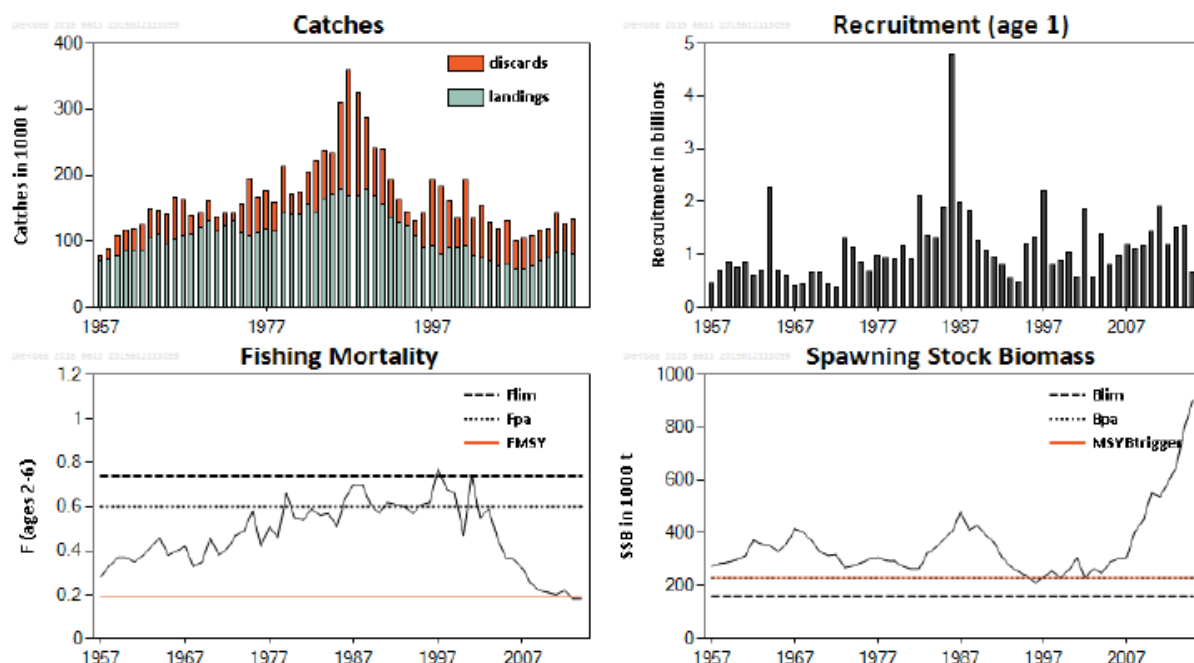
\*It is not possible to analyse years before 2013 because quantitative advice was not provide for one of the other stocks in each of the years from 2006-2012. Note that all figures are in units of 'landings' – i.e. an estimate of discards has been subtracted out. The definition of VIId and VIIe plaice is as follows: for 2015 it is the stock from each area; for previous years it is landings from each area. Source: ICES, 2015e and 2014d (Note: 2015 advice for western Channel plaice was not available at time of writing).

ICES assess the eastern Channel plaice stock using an age-based analytical assessment similar to that described for sole above, and using the same sources of data.

#### 2.4.2.2. North Sea plaice

ICES' assessment of the development of the North Sea plaice stock over time is summarised in Figure 14. ICES note: '*The combined North Sea and Skagerrak stock is well above MSY Btrigger, increased in the past ten years, and has reached a record-high. Recruitment has been around the long-term average since the mid-2000s. In recent years, fishing mortality (F) has been estimated around  $F_{MSY}$* ' (ICES, 2015f). They conclude that the

stock biomass is well above the trigger reference point and fishing mortality is approximately at the MSY reference point (Figure 15).



**Figure 14.** ICES' 2015 assessment of the North Sea plaice stock. Top left: catches (landings + discards), top right: estimated recruitment (2015 assumed as mean of time series); Bottom left: estimated fishing mortality relative to  $F_{MSY}$  (red line),  $F_{pa}$  (dashed) and  $F_{lim}$  (black dotted); bottom right: estimated SSB relative to  $B_{lim}$  (dashed line) and  $B_{pa}$  /  $MSYB_{trigger}$  (red dotted line). Source: ICES, 2015f.

		Fishing pressure				Stock size		
		2012	2013	2014		2013	2014	2015
Maximum Sustainable Yield	$F_{MSY}$	✗	✓	✓	Appropriate	✓	✓	✓
Precautionary approach	$F_{pa}$ , $F_{lim}$	✓	✓	✓	Harvested sustainably	✓	✓	✓
Management plan	$F_{MGT}$	✓	✓	✓	Below	✓	✓	✓
						MSY	✓	✓
						$B_{trigger}$	✓	✓
						$B_{pa}$ , $B_{lim}$	✓	✓
						$SSB_{MGT}$	✓	✓
								Above trigger
								Full reproductive capacity
								Above

**Figure 15.** ICES' assessment of stock status relative to reference points for North Sea plaice (ICES, 2015f).

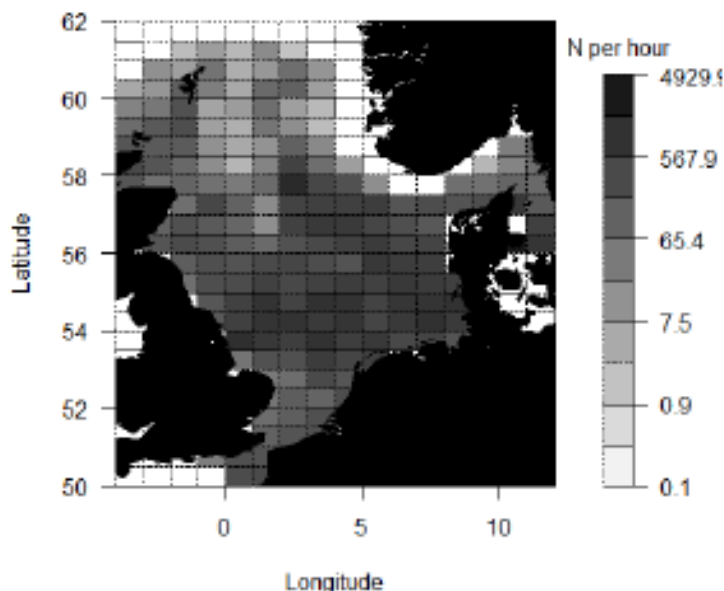
There is an EU management plan (Regulation 676/2007) as described for North Sea sole above, which sets a target  $F_{MP}$  of 0.3 - higher than ICES' estimate of  $F_{MSY}$  of 0.2, but lower than  $F_{pa}$  and  $F_{lim}$  (0.6, 0.75). The management plan includes a TAC constraint of 15%, which comes into play in the most recent ICES advice (ICES, 2015f) because fishing at the  $F_{MP}$  implies a TAC increase of 18% for 2016. Note that ICES includes discards in the assessment and ICES advice on landings takes discards into account. ICES advice, TACs and ICES estimated landings are compared since 2007 in Table 14.

**Table 14. Comparison of ICES advice, TACs and landings for North Sea plaice, 2007-15. From ICES, 2015f.**

Year	Landings corresponding to ICES advice ('000 t)	TAC ('000 t)	ICES estimated landings ('000 t)	ICES estimated discards ('000 t)
2007	32	50	50	39
2008	35	49	49	44
2009	55.5	55.5	55	44
2010	63.8	63.8	61	45
2011	64.2	73.4	67	40
2012	84.4	84.4	74	59
2013	97.1	97.1	79	39
2014	111.6	111.6	69	52
2015	128.4	128.4		

#### 2.4.2.3. Dab

ICES (ICES, 2015c) note that dab are '*one of the most abundant species*' in the North Sea; the Marine Conservation Society also state that it is the most abundant fish species in the North Sea, after sandeel<sup>99</sup> (but do not provide a reference for this statement).

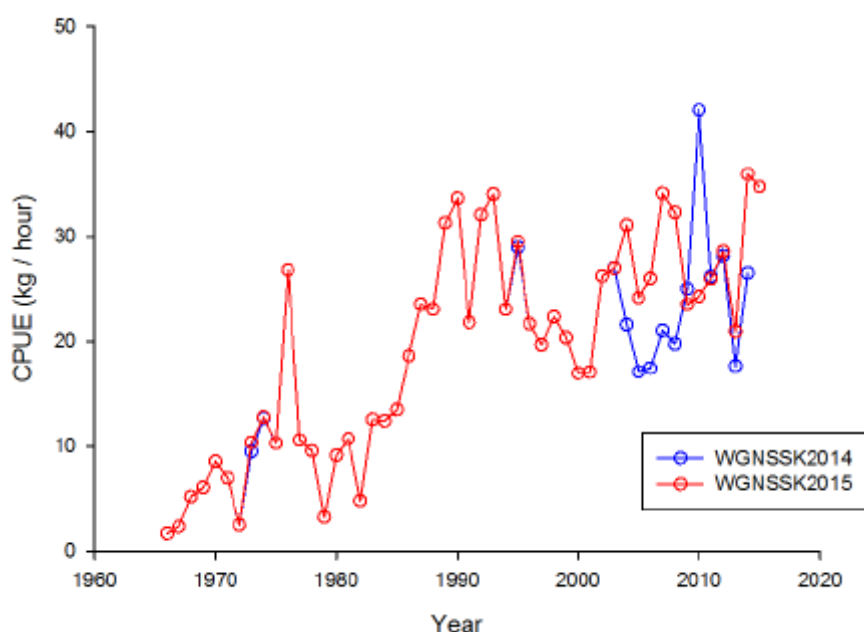


**Figure 16. Index of dab abundance by area in the North Sea, from the ITBS Q1 beam trawl survey data (from ICES, 2015c).**

<sup>99</sup> <http://www.fishonline.org/fish/96/Dab>

ICES advice is only given for the North Sea dab stock; for the purposes of this assessment and lacking any direct information on stock distribution, we assume that eastern Channel dab are part of the same stock. WGNSSK provide no information on stock identity, except to note that it is probable that dab in the North Sea, the western British Isles and the Baltic are separate stocks (ICES, 2015c). Dab were assessed by WGNSSK for the first time in 2014. The assessment is largely based on the International Bottom Trawl Survey (ITBS) first quarter beam trawl survey data, which also includes the eastern Channel (Figure 16).

An index of mature dab biomass was estimated by WGNSSK in 2014 and 2015, based on historical ITBS Q1 information. The index has been stable in recent years, after an apparent increase in biomass from the start of the time series (~1965) to ~1990 (however, note that prior to 1983, the gear was not fully standardised, so this part of the time series needs to be treated with caution. ICES advice gives the time series from 1983 onwards and notes that *'survey indices show a highly variable abundance without trend'*.



**Figure 17. Index of abundant of mature dab from ITBS Q1 data, as estimated by WGNSSK in 2014 (blue) and 2015 (red) (in units of CPUE; kg / hour). Note: according to WGNSSK 2015, the gear was not fully standardised prior to 1983, so the early part of the time series needs to be treated with caution. Source: ICES, 2015c.**

ICES provides advice based on the framework for data-limited stocks Category 3 (stocks for which survey-based assessments indicate trends) (ICES, 2012b). The advice is based on a comparison of the two latest index values (2014–2015) with the three preceding values (2011–2013), multiplied by the recent average catch (2012–2014). Where the index has increased by less than or more than 20% (more than in this case), ICES applies a 20% ‘uncertainty cap’ to the change in the advised catch relative to the previous year.

As for eastern Channel sole, it is complicated to compare ICES advice to the EU TAC; for three main reasons: i) most of the dab catch (~90%) is discarded, ii) the EU sets a joint TAC for dab and flounder in IIIa and IV, with no TAC in VIId and iii) ICES has only been

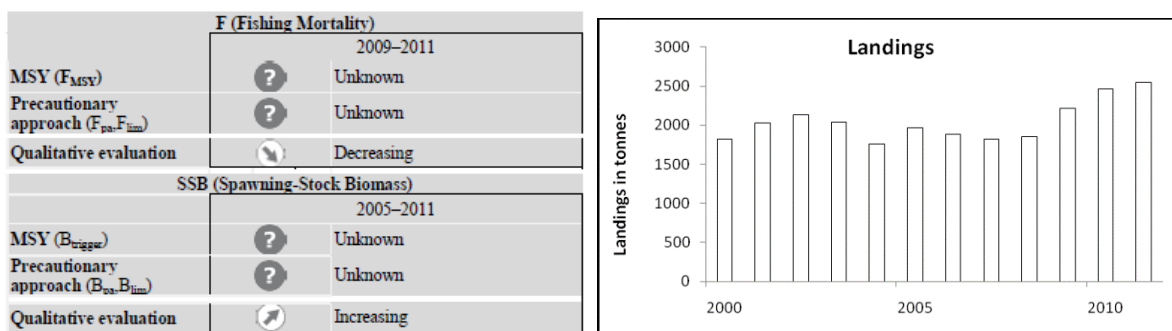
providing (biennial) quantitative advice since 2014. For 2014 and 2015, ICES advised total landings for North Sea dab of not more than 7,795 t, and estimated landings in 2014 to be 4,964 t (corresponding to a total estimated catch of 67,895 t). For 2016 and 2017, ICES advise a total catch of not more than 76,075 t, corresponding to a total catch of not more than 7,608 t, assuming the discard rate remains the same as 2011-13 (which, with the landings obligation, remains to be seen – see below).

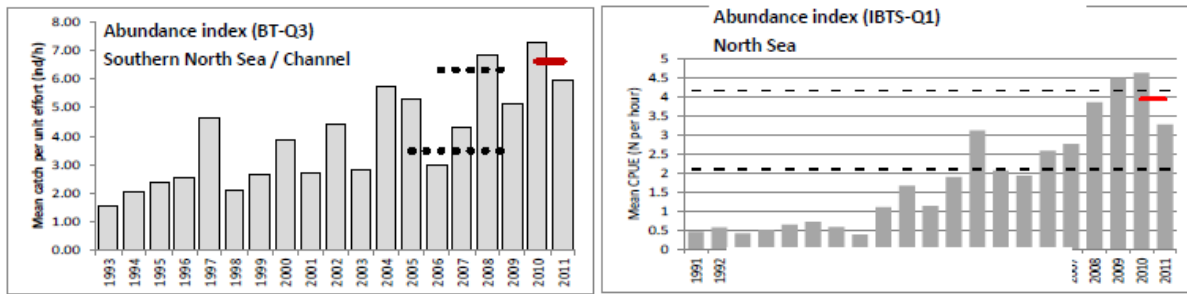
#### 2.4.2.4. Small-spotted catshark (lesser-spotted dogfish)

*S. canicula* is a small, common catshark and is one of the most abundant shark species in the Northeast Atlantic and Mediterranean, with a distribution ranging from Norway and the Shetland Islands to Senegal and found throughout the Mediterranean Sea. Reproduction is oviparous and the species appears to be relatively productive biologically, thus may be able to withstand higher levels of exploitation that most shark species (Ellis et al., 2009). Though commercial landings are made and large individuals are retained for human consumption, the species is often discarded and studies show that post-discard survival rates are high (see review in Revill 2012). The species is listed as Least Concern on the IUCN red list (Ellis et al., 2009).

The stock under consideration here is the North Sea and eastern Channel stock (IIIa, IV and VIIId). ICES considers the stock to be data-limited, and advice is intermittent - the most recent advice was issued in 2012, initially valid for 2013 and 2014 but now also extended to 2015. New advice is due out in October 2015 and was not available at time of writing. Advice is based on a semi-quantitative evaluation of stock status based on a beam trawl surveys (BTS) and the ITBS.

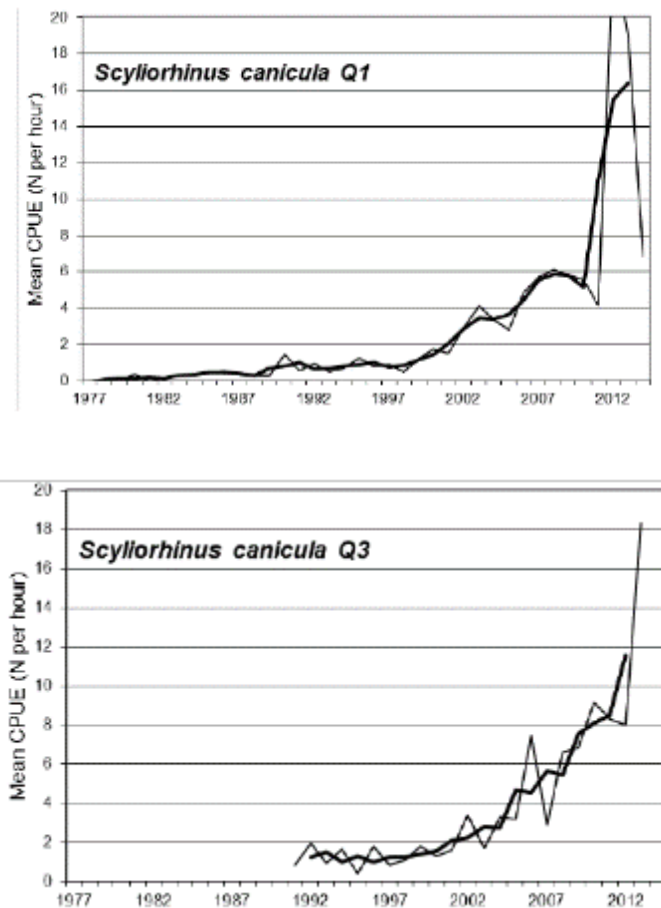
For the Eastern Channel stock, according to ICES (2012c) the BTS-Q3 and IBTS-Q1 (North Sea) averages, both assumed as stock size indicators, were respectively 35% and 26% higher for the period 2010-2011 than the average of the five previous years (2005-2009). Given the increase in abundance, and stable/increasing catches, ICES (2012a) infers that fishing mortality is stable or decreasing (Figure 18). Based on the ICES approach to data-limited stocks, the advice is given that catches could be increased by a maximum of 20% for 2013 (note that this is not further recommended for 2014 and 2015). ICES for the time being does not advise that an individual TAC be set for this stock.





**Figure 18.** Top left: stock status summary of lesser-spotted dogfish in Subareas and Divisions IIIa, IV, and VIId. Top right: Reported landings (tonnes). Bottom left: Mean catch per unit effort of BTS-Q3 survey in Divisions IVc–VIId. Bottom right: catch per unit effort of IBTS-Q1 in Subarea IV. Dashed lines show the mean ( $\pm$  1SD) cpue for 2005–2009, the red line shows the mean CPUE for 2010–2011 (From ICES, 2012a)

According to WGEF (ICES, 2014e), the abundance of *S. canicula* is increasing in the North Sea and the eastern Channel, and the species is also spreading north in the North Sea (Figure 19). For the English Channel, ICES report that the French Channel Groundfish Survey (CGFS) also shows an increasing trend (Figure 20).



**Figure 19.** Average catch of *Scylliorhinus canicula* (N per hour) and three year running mean during the North Sea IBTS-Q1 (top) and Q3 (bottom) surveys. ICES, 2014e, Figures 25.4a and b.

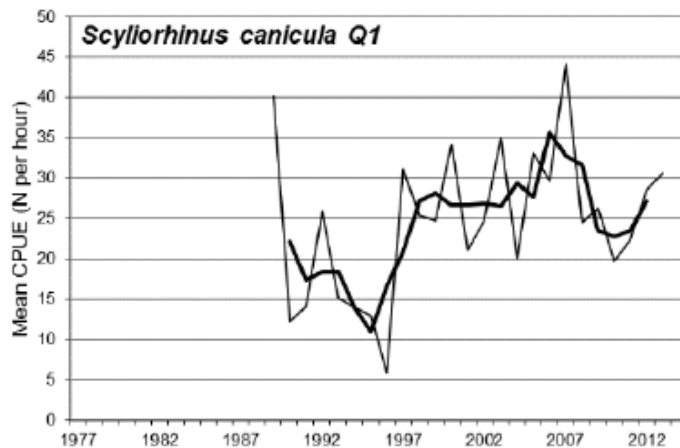


Figure 20. Average catch of *Scyllorhinus canicula* (N per hour) and three year running mean during the Eastern Channel CGFS-Q4 Survey. ICES, 2014e, Figure 25.6.

#### 2.4.2.5. Cod

For the cod stock in the North Sea and eastern Channel (IIIa, IV and VIId), ICES provide an annual analytic assessment, which was benchmarked in 2015. ICES (2015g) estimates that  $F$  is still somewhat above  $F_{MSY}$ , but that  $B$  has recovered above  $B_{lim}$ , although it remains below  $MSYB_{trigger}$  (Figure 21).

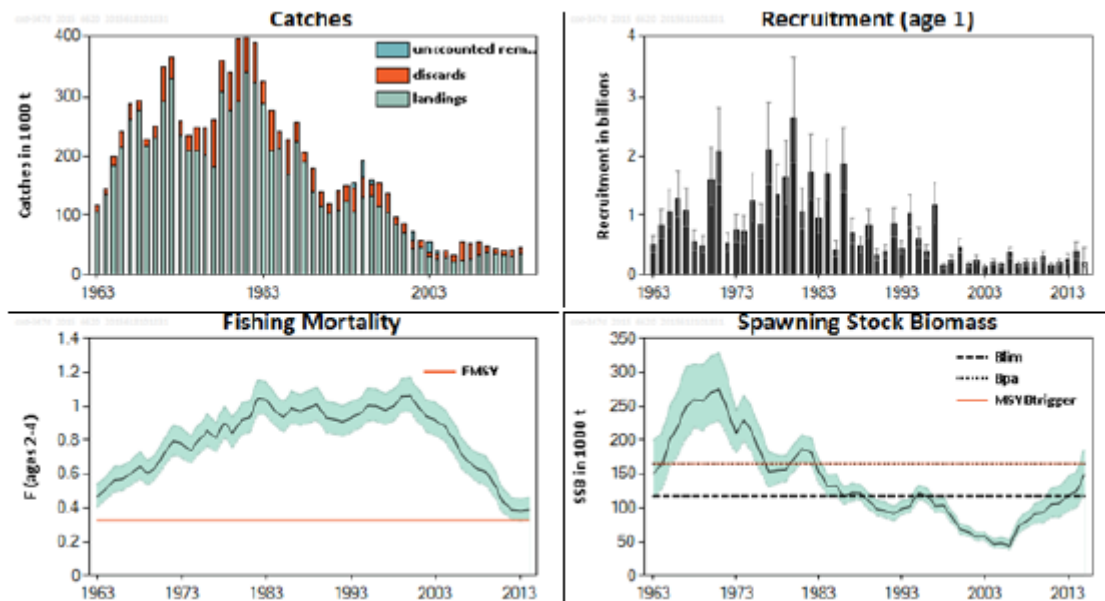


Figure 21. ICES' 2015 assessment of the North Sea and eastern Channel cod stock. Top left: catches (landings + discards), top right: estimated recruitment (2015 assumed as mean of recent recruitment); Bottom left: estimated fishing mortality relative to  $F_{MSY}$ ; bottom right: estimated SSB relative to  $B_{lim}$  (dashed line) and  $B_{pa}$  /  $MSYB_{trigger}$  (red line). Source: ICES, 2015g.

There is an agreed EU-Norway long-term management plan for North Sea cod, based on an initial recovery phase followed by a long-term phase – ICES considered that the stock had switched from the recovery to long-term phase in 2013. Further to the new stock assessment

in 2015, however (ICES, 2015c), ICES have re-estimated the value of reference points, and the the management plan is now inconsistent with this ( $F_{MP}$  long-term = 0.4, ICES (2015) estimate estimate of  $F_{MSY}$  = 0.33). There has not yet been time for the management plan to respond to the 2015 stock assessment, so ICES provided advice in 2015 based on the MSY framework rather than the management plan reference point (ICES, 2015g). ICES advice, TAC and landings are compared in

Table 15 (discards also included for reference) from 2010 (the first year in which the eastern Channel was included in the advice). The TAC has been set broadly consistent with ICES advice over this period, although in 2015 it was set higher while ICES recommended a decrease; the reason for this is unknown.

**Table 15. Comparison of ICES advice, TACs and landings for North Sea and eastern Channel cod, 2010-15. From ICES, 2015g.**

Year	landings corresponding to ICES advice ('000 t)	TAC ('000 t)	ICES estimated landings ('000 t)	ICES estimated discards ('000 t)
2010	40.3	33.6	31.0	10.1
2011	-	26.8	26.7	6.1
2012	31.8	26.5	26.6	6.5
2013	25.4	26.5	25.3	8.4
2014	28.8	27.8	28.5	7.9
2015	26.7	29.2		

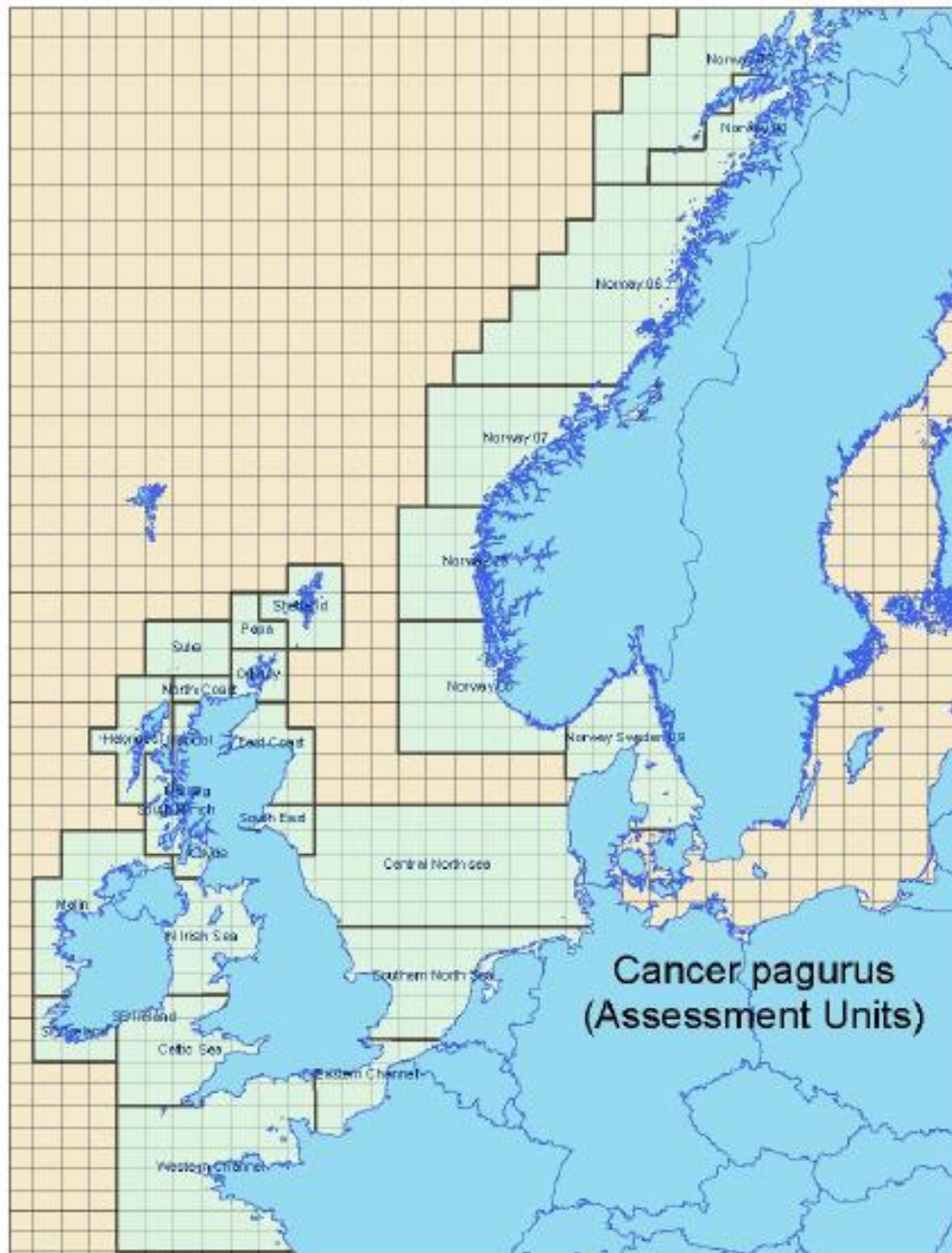
#### 2.4.2.6. Edible crab

The ICES working group on the biology and life history of crabs (WGCRAB) met for the first time in 2013. The 2013 report (ICES, 2013b) summarises the data available from the French crab fishery and assessments; WGCRAB 2014 does not provide much additional information.

Stock structure: In terms of stock structure, WGCRAB note that the Channel and the North Sea are most likely different stocks, while Ifremer considers based on genetics and tagging studies that the western Channel and the Bay of Biscay are part of the same stock. No direct information is available for the eastern Channel (which is not a particularly significant area for crab fisheries) but on this basis it seems most likely that it is part of the same stock as either the western Channel or the southern North Sea, or a mixture, rather than a completely separate stock.

WGCRAB has defined 'assessment units' for edible crab as shown in Figure 22. It separates the eastern and western Channel, although seems to be on the basis of data availability rather than based on any information about stock structure. It also separates the Channel and the southern North Sea, but taking a line drawn from the Thames estuary to the Belgian-Netherlands border, rather than using the ICES Subarea boundary – i.e. it includes the

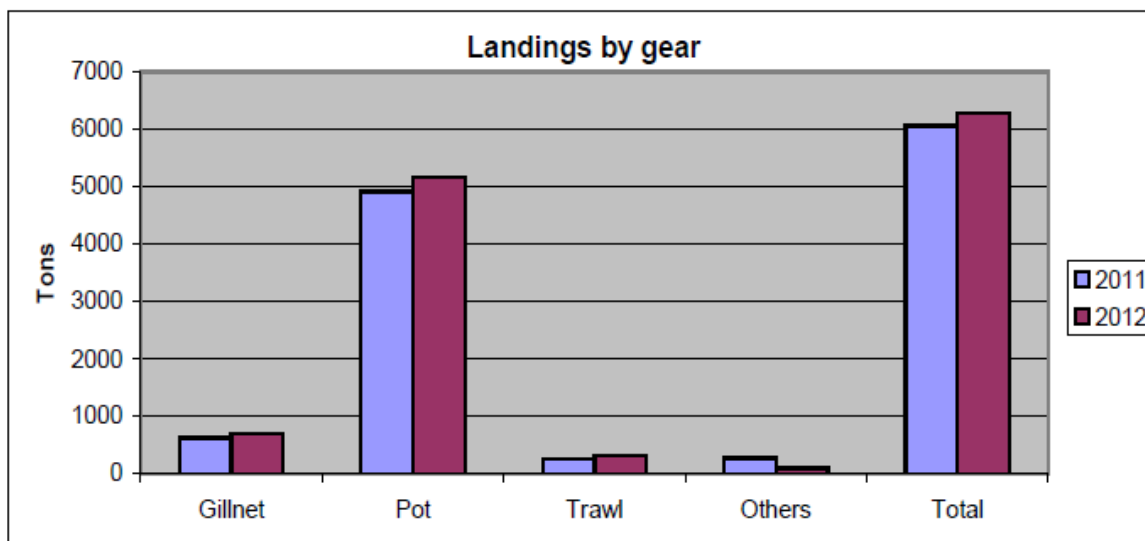
whole of this fishery in the 'eastern Channel' area. It is not clear why this was done, but it may be because the main English crab fisheries in this part of the east coast are situated north of the Thames estuary – mainly in north Norfolk.



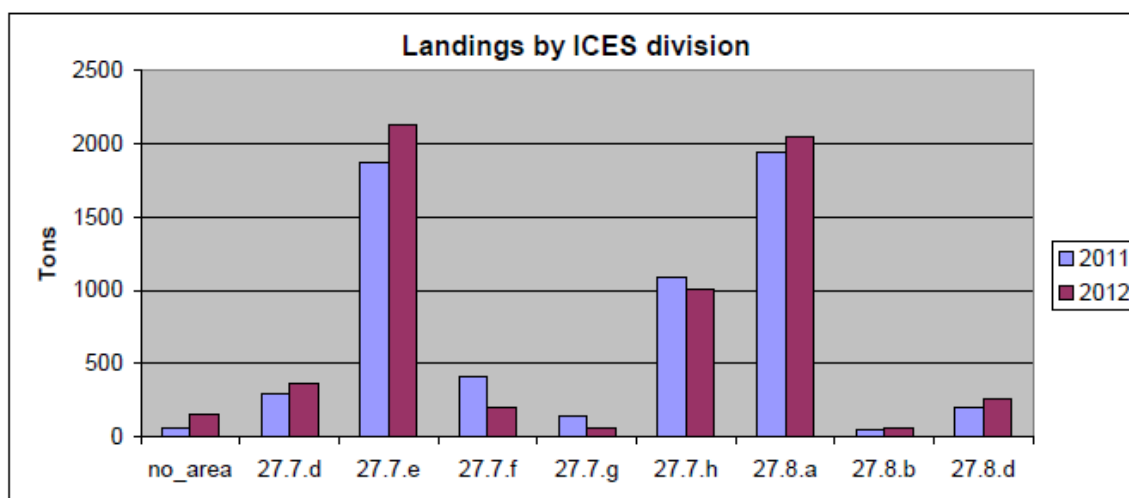
**Figure 22. Assessment units for edible crab, as defined by WGCRAb (ICES, 2014f).**

In order to evaluate the stock status and likely impact of this fishery on edible crab, under Principle 2, the team decided to also review the information available from both VIIe (the western Channel / Biscay stock) and IVc (the southern North Sea stock), without taking a view on which stock(s) the crab fished by this fishery was likely to belong to.

Channel / Biscay stock: French Edible crab landings by gear and area are shown in Figure 23 and Figure 24. Gillnets make up ~11% of the total landings, but most come from the targeted pot fishery. Landings from the eastern Channel are ~5-7% of the total landings, but most come from the western Channel and the Bay of Biscay.



**Figure 23. Landings by gear, edible crab, France (ICES, 2013b)**

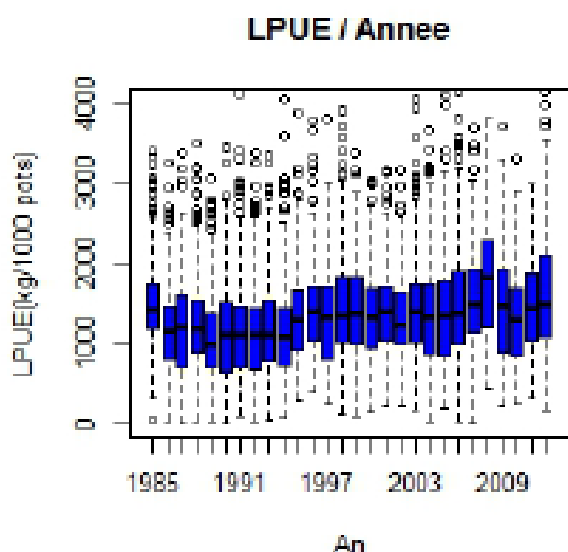


**Figure 24. French landings of edible crab by fishing area (ICES, 2013b)**

Ifremer have tracked crab stocks in the western Channel and northern Bay of Biscay for ~30 years (Martial Laurens, Ifremer, pers. comm.). They use the 'SACROIS' model to develop an accurate and robust data set of landings and effort for edible crab. This involves cross-references of different sources of data: i.e. the fishing fleet register, logbooks (or 'fiches de pêche' for the smaller vessels), sales notes, VMS and fishing activity calendars. For crabs, Ifremer use data from logbooks / fiches de pêche and landings declarations from the offshore potter fleet, verified against the other data sets, and with information about the vessel type (size, gear) and area included. They focus on the data from the offshore potting vessels, because they represent a large proportion of the landings and they target crab all

year; also, since crab is mainly a bycatch for the other gear types, estimates of effort are difficult for other fleets.

Ifremer has a SACROIS time series for this fleet from 1985-2012 (as of 2013), during which time the number of vessels halved from 26 to 13, but the effort (as measured in pot lifts) has stayed ~stable because the remaining vessels are larger, use more pots and have longer trips. The data are analysed using a GLM model including year, month, day, area (ICES rectangle and ICES division), vessel and trip as factors and LPUE as the dependent variable. The trend over this time period is stable or perhaps slightly increasing (Figure 25), and the model fits the data well ( $R^2 > 0.9$ ) (ICES, 2013b).



**Figure 25. Landings per unit of effort (kg/1000 pots) by in ICES Divisions VIIe and VIIIa (western Channel and north Bay of Biscay), 1985-2012, from Ifremer (ICES, 2013b).**

North Sea stock: As is apparent from above, France does not particularly track crab landings and effort from IVc since there are no French targeted crab fisheries in the area. It is likely that most of the French landings of crab from IVc would come from the net fishery (M. Laurens, Ifremer, pers. comm.). Total ObsMer estimates of catch of edible crab by this fishery for 2014 (Ifremer 2015) is ~550 t (460t landings, 90t discards), and if we assume that crab landings are from VIIId and IVc in the same proportion as sole (i.e. ~80/20 – see Table 5 above), then this would represent ~90 t of French crab landings (~110 t catch) for 2014 – about 20 times smaller than the French landings from VIIe. It makes sense, therefore, for Ifremer to concentrate its scientific effort elsewhere.

Conversely, the southern North Sea is a significant area for UK crab landings, and there have been various attempts at stock assessments on the UK side – although mainly further north around the Norfolk coast. CEFAS report in WGCRAb 2014 (ICES, 2014f) that summary stock assessments are publically available, but this appears to be true only up to 2011. The southern North Sea crab assessment for 2011 (CEFAS 2011) reports that the stock status cannot be evaluated, since recording of fishery data changed in the period 2006-10 such that it is unsuitable for assessment; however, they consider that exploitation rates may be higher than those required for MSY.

Conversely, a more recent assessment by the Eastern IFCA (EIFCA, 2014) which attempts to fit a replacement yield model for each ICES statistical rectangle, concludes (albeit with considerable uncertainty) that exploitation rates are either below or around the level required for MSY. They note that there may be some evidence for a reduction in productivity or availability starting in 2010, since the data set shows some changes, but that this may be an artefact of changes in data recording – given CEFAS' conclusions about changes in data recording, this would appear to be the most likely explanation.

Note that the various analyses presented above include fisheries which represent ~700 t of landings (EIFCA) or ~2000 t (CEFAS, Vlle) – i.e. 7 or 20 times larger than this fishery – i.e. regardless of the stock structure, it is not likely that this fishery represents a significant proportion of the effort on any of the stocks in the area.

#### **2.4.3. Discarded species**

The analysis above (Table 12) shows that although there are significant discards associated with this fishery, they are all of species that are of some commercial importance and are sometimes landed. There are no 'bycatch' species under the MSC definition, main or otherwise.

Under the reformed CFP, the EU is bringing in a landings obligation, which will ban discarding under most circumstances. So far, the landings obligation has only come into force for pelagic fisheries. Planning for this fishery is still somewhat unclear – the landings obligation should apply to this fishery from January 2016, but it has been proposed that it will be phased in. The Scheveningen Group (subgroup of the North Sea AC) have proposed a Discard Plan (NSAC 2015), which gives the following timetable for sole and plaice net fisheries (only species of concern to this fishery are mentioned):

- from 2016 – all sole to be landed
- from 2017 – sole + cod
- from 2018 – sole + cod + plaice
- from 2019 – all quota species

Meanwhile, research is on going in a variety of fisheries to evaluate discard survival of various species and gears, in order to see where derogations to the landings obligation on the basis of high discard survival might be application<sup>10</sup>.

The team also considered the possibility of ghost fishing by lost gear (the rates of loss of gear and efforts to avoid it are considered further under 'Habitats' below). Given that i) lost gear is usually retrieved; ii) currents are strong in this area and iii) high productivity leads to rapid fouling of any hard substrata left underwater, the team considered that ghost fishing by lost nets would be unlikely, since nets would be folded up and fouled in relatively short order.

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<sup>10</sup> See DEFRA survival experiments matrix on the North Sea AC website:  
<http://www.nsrac.org/category/keydocs/scientific-trials/>

## 2.4.4. ETP species

### 2.4.4.1. Identifying ETP species

The ObsMer synthesis reports (Ifremer 2012, 2013 and 2015) do not provided enough information to evaluate interactions of this fishery with ETP species, so instead the team evaluated 85 individual observer reports from 2013 and 2014, covering 25 of the vessels in the UoC.

Species mentioned in the reports were cross-referenced with a list of species with protected status in France from French law or international treaties (the latter generally incorporated into French law via an arrêté)<sup>11</sup>. The interactions with ETP species are summarised in Table 16.

**Table 16. Interactions with ETP species from 85 observer reports from 2013 and 2014.**

Species	ETP	No. of individuals	Type of interaction	Outcome of interaction
Harbour porpoise <i>Phocoena phocoena</i>	Protected under French law <sup>12</sup> (arrêté inter-ministériel of 1 June 2011)	1	Entanglement with a marker buoy	Dead
Allis shad <i>Alosa alosa</i>	Protected under French law <sup>13</sup> (arrêté inter-ministériel of 8 Dec. 1988)	5	Caught in net	Retained or discarded dead
Twaite shad <i>Alosa fallax</i>		1	Caught in net	Discarded dead

### 2.4.4.2. Birds

There are several SPA-Natura 2000 European sites along the coast where the fisheries take place, designated for the protection of birds nesting, feeding, overwintering or migrating through (Figure 26). The numbers of mostly seabird species considered for each Natura 2000 Bird site are given in Table 18 from the north: the Bancs des Flandres, Cap Griz-Nez, estuaires picards: Baie Canche, Baie de Somme et d'Authie, Littoral seino-marin. Several recent reviews of interactions between seabirds and set fishing nets (gillnets) do not identify the fisheries in the Southern North Sea or the Eastern Channel as posing a significant threat, although there is a need for more data from coastal fisheries (ICES, 2013c; Wiedenfeld et al., 2015; Zydels et al., 2013). Fishermen report that occasionally a bird is caught in the net, but that this is rare. No bird entanglements were noted in the 85 observer reports.

<sup>11</sup> See <http://inpn.mnhn.fr/reglementation/protection/listeProtections/national>

<sup>12</sup> See <http://inpn.mnhn.fr/reglementation/protection/listeEspecesParArrete/3561>

<sup>13</sup> See <http://inpn.mnhn.fr/reglementation/protection/listeEspecesParArrete/716>

#### 2.4.4.3. Marine mammals

There is also some seal depredation, again rare, but the seals do not reportedly get entangled. Again, the 85 observer reports make no mention of seals. The Ifremer report to ICES WGBYC (2015h) notes the incidental catch of two seals in the set net fishery in the Channel, but it appears that these were both in the western Channel (Ifremer 2012b). Reportedly, fishermen have noticed that marine mammal numbers in the eastern Channel have increased considerably in recent years – 2011 was reported to be an ‘exceptional’ year for harbour porpoise (Ifremer 2012b). The reason for this is not known.

Council Regulation (EC) No 812/2004 (Reg. 812) sets out monitoring requirements for cetacean bycatch for métiers considered to pose a risk to cetaceans. IFREMER commenced a cetacean bycatch monitoring programme in 2006 as part of the OBSMER observer programme (initially OBSMAM, now FilManCet) (Morizur et al., 2011 – there does not seem to be a formal FilManCet report publically available since then). The programme aimed at 10% observer coverage aboard the concerned fleets – these data are then submitted to the Commission by France and are reviewed by the ICES Working Group on Bycatch of Protected Species (WGBYC) who analyse the available data on incidental catches of cetaceans across member states. France submitted a report to ASCOBANS in 2014, but did not submit a formal report to WGBYC in 2014 or 2015; in 2015 they submitted a FilManCet report noting two bycatch incidents of seals (but not in this area); in 2013 they reported one porpoise bycatch event out of 58 observations for netters in IVc and VIId (presumably the same one as recorded above) (ICES, 2013c, 2014g and 2015h). Note that 10% observer coverage has not been attained in this fishery to date.

WGBYC have tried to estimate the total porpoise bycatch in gillnets in the North Sea (including IIIa and VIId) – see Table 9 of ICES (2015h). They give an estimate range of 1 235 to 1 990 individuals caught in the entire area, out of a total estimated population of 274,000, giving an annual bycatch per cent from netting of 0.45-0.73% of the population. ASCOBANS has set a conservation objective for harbour porpoises of less than 1.7% of additional mortality (given in ICES, 2015h), beyond which they estimate population-level impacts – in the worst case scenario (upper CI) this métier in total accounts for just less than half of this bycatch rate.

EU Reg. 812 requires pingers to be put on nets in the Channel, with the objective of reducing marine mammal bycatch. This is not required in the North Sea; the Channel (in aggregate) was reportedly considered to be an area of high risk for cetacean bycatch in net fisheries. This fishery has never adhered to this regulation, because the available pingers turned out to be impractical to use, being expensive, cumbersome to deploy and prone to getting lost (and non-biodegradable). Instead, the project 'FilManCet' was established by Ifremer to support a request for a derogation from this regulation for this fishery, on the basis that there is no evidence either that interaction rates with porpoises are significant or that pingers are effective. (In fact, fishers note that in the Dunkerque area there are often (non-lethal) interactions with seals even when nets have pingers, and some speculated that the seals are actually attracted by the pingers, since they signal a source of food.) The NGO 'Océan' has also reportedly expressed concern about the possible impact of pingers on

cetacean migration routes, although note that the team did not have any direct communication with them. The derogation request is reportedly under consideration at present.

There are two SACs in place overlapping with the fishery, the Banc des Flandres in IVc and the ridens de Boulogne in VIId, which are designated for the presence of porpoises and seals, as well as for habitats – this is discussed in detail under 'Habitats' below.

#### 2.4.4.4. Fish

Some discarding of the undulate ray (*Raja undulata*) is noted in the observer reports (total 30 individuals, discarded with uncertain mortality). In 2009, the undulate ray (*Raja undulata*) was put on the list of prohibited species in the annual EU Regulations fixing fishing opportunities. ICES (2014e) notes that this was not following an ICES recommendation, and ICES considered that the species would have been better managed under local measures (e.g. zero TACs in areas of concern). WGEF notes that ICES considered at the time that there '*was no justification for placing undulate ray on the prohibited species list*' (WGEF 2014: 14-15). In 2014, the species was removed from the Prohibited List for Subarea VII, although it remained a species that could not be retained or landed (see EU Regulation 2015/104). In 2015, following scientific advice from the STECF indicating that it was precautionary, a small bycatch quota was introduced for undulate ray in ICES areas VIId (and other areas)<sup>14</sup>. As a result France introduced legislation to limit landings to 150kg per trip per vessel for netters (and others) in VIId up to a total of 6 tonnes, 2 tonnes maximum per metier<sup>15</sup>. *Raja undulata* was therefore not considered to be an ETP species in this assessment.

### **Allis shad**

Although the Allis shad is protected under French law, it is assessed as 'least concern' by IUCN (Freyhof et al., 2008a). They note that although there were large population declines in the first half of the 20<sup>th</sup> century (mainly due to impoundment and pollution in its riverine habitat), the population appears to have stabilised. Most of the global population is in France, notably in the Loire and Garonne catchments emptying into the Bay of Biscay.

### **Twaite shad**

Twaite shad is a more northerly species than Allis shad, being more abundant in catchments around the North Sea and Baltic. Like the Allis shad, it is assessed as 'least concern' by IUCN (Freyhof et al., 2008b), who note that it is '*quite common*' around the North Sea and the French Atlantic coast, and that populations are increasing in the Baltic.

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<sup>14</sup> Council Regulation (EU) 2015/523 amending Regulations (EU) No 43/2014 and (EU) 2015/104 as regards certain fishing opportunities

<sup>15</sup> <http://www.legifrance.gouv.fr/eli/arrete/2015/7/31/DEVM1514865A/jo/texte>

## 2.4.5. Habitats

### 2.4.5.1. Sole habitat requirements

Sole prefer sand and mud habitats where they can bury easily (Miller and Loates, 1997). A detailed analysis of sole habitat preferences (along with plaice and lemon sole) (Hinz et al., 2006) based on CEFAS survey data and habitat information from the British Geological Survey, is summarised in Table 17 below. Habitats with a high proportion of survey sites with consistently high abundance (CHS) of sole (>50% of sites) were slightly muddy sand, sand with sand waves and fine shelly sand; the habitat with highest proportion of sites with low or zero sole was gravelly sand, either alone or with large rocks, cobbles and/or boulders. The authors conclude from their study that sole habitat preferences are for lower salinity and higher temperature sites with few shells and stones.

QTC class (substratum description)	1 (Mud)	2 (Slightly muddy sand with occasional broken shell)	3 (Sand with no sand waves)	4 (Sand with sand waves and shell fragments)	5 (Fine shelly sand with small stones and shell fragments)	6 (Shelly sand)	7 (Shelly sand gravel with large stones)	8 (Gravelly sand)	9 (Gravelly sand with large rocks)	10 (Gravelly sand with cobbles and boulders)
<b>Plaice</b>										
CHS	2	6	5	3	6	4	4		1	
VLS	5	1	1	2	4	4	3	5	4	1
0-C	1							2	4	2
<b>Sole</b>										
CHS	3	4	1	3	6	2	2	1	1	
VLS	5	3	5	2	4	6	5	5	6	
0-C								1	2	3
<b>Lemon sole</b>										
CHS			1		3	4		1		
VLS	4	1	3	1	2	2	4	2	5	1
0-C	4	6	1	4	5	2	3	4	4	2

**Table 17. Survey site categorisation for different habitat types for plaice, sole (middle) and lemon sole.**

CHS= survey sites with consistently high abundance of the species concerned, VLS= sites with variable and low abundance, 0-C= sites where the species is not caught by the survey. Habitat categorisations are along the top. Table 2 in Hinz et al., 2005

### 2.4.5.2. Impact of the gear on habitats

This fishery uses fixed gear, which is less damaging to habitats than towed gears, but since the nets are set in contact with the bottom, there is inevitably some impact. Evaluations of the relative impact of different fishing gears (Morgan and Chuenpagdee 2003, Chuenpagdee et al., 2003) rank bottom-set gillnets as 'medium' in terms of physical damage to habitats – similar to pots and traps and lower than trawls and dredges but higher (obviously) than pelagic gear or hook and line. The most likely form of damage to occur would be damage to emergent epifauna (corals, sponges, sea pens etc.), which might be uprooted, broken or crushed by contact with the bottom of the net or the anchors. These sorts of habitats can thus be considered sensitive as far as this gear is concerned.

#### 2.4.5.3. Sensitive habitats in the area of the fishery

From above, sensitive habitats in this case can be defined as those with emergent epifauna. To evaluate the distribution of these habitats in relation to the fishery, we reviewed OSPAR maps of sensitive and threatened habitats for the area ([www.ospar.org](http://www.ospar.org); <http://www.emodnet-seabedhabitats.eu/>) and potential overlap of sensitive habitats (those with emergent flora/fauna) in relation to the distribution of effort of the fishery (see Figure 2 and Figure 3).

The only habitat of possible concern is an area of maerl in the middle of the eastern Channel, about 15nm offshore (west) of Boulogne (the *Sabellaria* reefs are inside the UK 6-mile limit and therefore not accessible; the other overlapping habitats are littoral or intertidal). The 'Ridens de Boulogne' are areas of rocks and sandbanks in the Channel, shallower than the surrounding areas, and more stable and persistent than underwater dunes. The ridens de Boulogne is the only ridens in the Channel which is entirely rocky, and forms a rocky reef about 15-20m deep, with specific biodiversity, including maerl and other algae as well as suspension feeders (mussels, anemones, brittle stars etc.)<sup>16</sup>. The area is part of a SAC<sup>17</sup>, which is protected for the maerl beds and marine biodiversity, as well as for the presence of harbour porpoise and seals as noted above.

#### 2.4.5.4. Protected areas

There are quite a number of protected areas under the Natura 2000 programme in the area of the fishery, which are listed in Table 18 and mapped in Figure 26. The Parc naturel marin des estuaires picards et de la mer d'Opale, which extends from North of Boulogne to south of Tréport (Note: there are no relevant protected areas on the UK side, although the Wight-Barfleur reef, between Cherbourg and the Isle of Wight, has been proposed as a 'site of community importance' (SCI)<sup>18</sup>.)

**Table 18. Natura 2000 protected areas overlapping with the fishery and their main features.**  
Source: Natura 2000 data sheets for each site

Type	Area	Natura 2000 reference	Natura 2000 species	Natura 2000 habitats	Other points of interest
SAC and SPA	Bancs des Flandres	FR3102004 FR3112006	porpoises, seals, 33 species of birds	Shallow subtidal sandbanks	densest maritime traffic in the world
SAC	Récifs Gris Nez Blanc Nez	FR3102003	porpoises, seals	Shallow subtidal sandbanks, reefs	gravel, cobble and rock substrates
SPA	Cap Gris Nez	FR3110085	115 species of birds		
SAC	Ridens et dunes hydrauliques du	FR3102004	porpoises, seals	Shallow subtidal sandbanks,	maerl; high biodiversity of

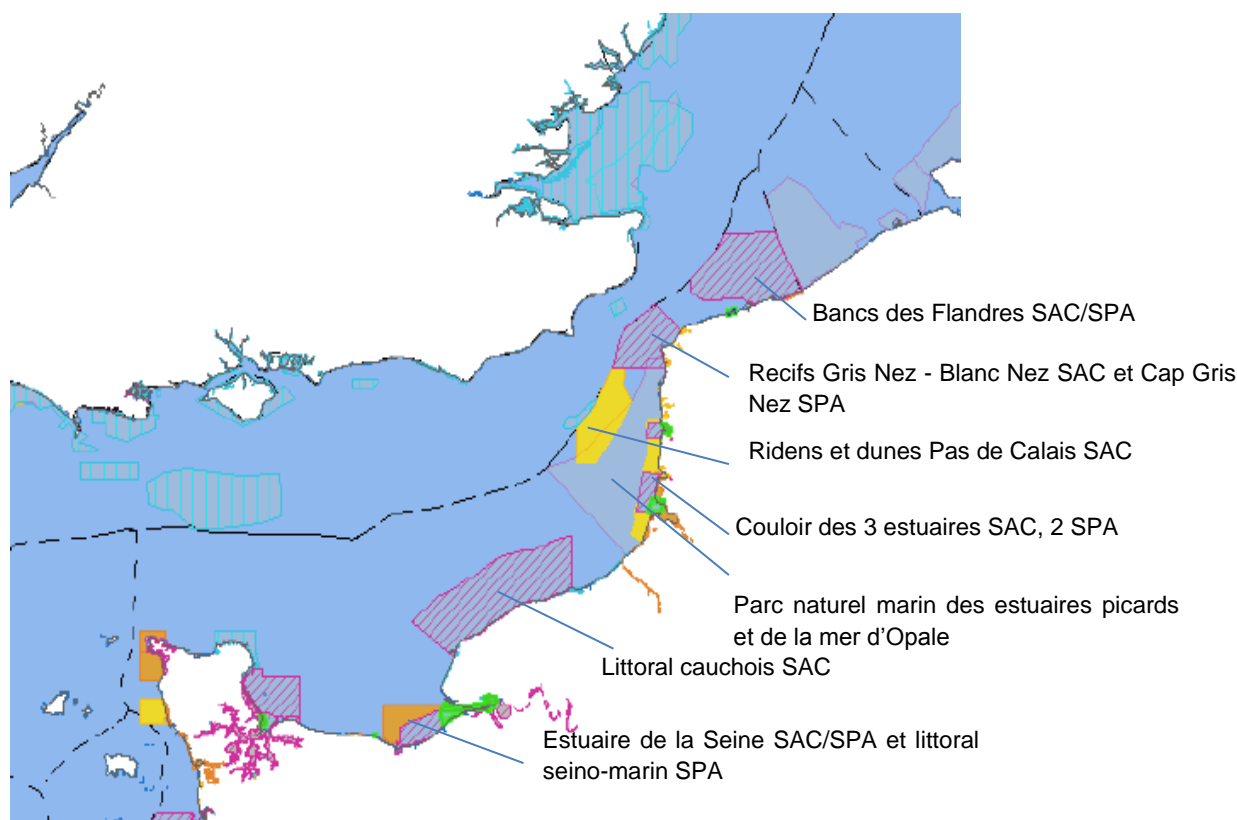
<sup>16</sup> See <http://inpn.mnhn.fr/docs/natura2000/fsdpdf/FR3102004.pdf>

<sup>17</sup> above footnote is the formal SAC data form

<sup>18</sup> See <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030380>

Type	Area	Natura 2000 reference	Natura 2000 species	Natura 2000 habitats	Other points of interest
	détroit du Pas-de-Calais			reefs	algae and suspension feeders
SAC	Baie de Canche Couloir des 3 estuaires	FR3102005	porpoises, seals, Allis shad, salmon, lamprey	Shallow subtidal sandbanks + intertidal and littoral habitats	estuarine and salt marsh communities
SPA	Estuaires picards: Estuaire de la Canche	FR3110038	71 species of birds		
SPA	Estuaires picards: Baie de Somme et d'Authie	FR2210068	45 species of birds		
SAC	Littoral cauchois	FR2300139	Allis and Twaite shad, porpoise, seals, salmon, lamprey, various terrestrial species	Reefs, cliffs, terrestrial habitats	Intertidal and subtidal rocky habitats down to 10m depth at low tide
SAC	Estuaire de la Seine	FR2300121	Allis and Twaite shad, porpoise, seals, salmon, lamprey, various freshwater and terrestrial species	Estuaries, shallow subtidal and intertidal sandbanks; various littoral habitats	estuarine and salt marsh communities
SPA	Estuaire et marais de la Basse Seine	FR2310044	122 species of birds		
SPA	Littoral Seino-Marin	FR2310045	79 species of birds		

Source: <http://inpn.mnhn.fr/accueil/recherche-de-donnees/natura2000>



**Figure 26. Map of the protected areas set out in Table 18 (taken from <http://carto.panache.eu.com/1/panache.map>).**

An analysis of the likely overlap of these areas with the fishery, and hence the fishery's overlap with Natura 2000 habitats and species, is given in Table 19. The potential impacts include porpoise and shad bycatch (considered above) and potential impacts on habitat structure and function in shallow subtidal sandbank habitats. Hence the analysis of habitat impacts needs to focus mainly on the potential impacts of the gear on these habitats.

**Table 19. Overlap of Natura 2000 areas with the sole fishery, and potential impacts on Natura 2000 species and/or habitats.**

Area	Likely overlap with sole fishery?	Potential impacts
Ridens et dunes hydrauliques du détroit du Pas-de-Calais	No – not sole habitat (rocky)	None
Bancs des Flandres	Perhaps – although area of dense maritime traffic makes fishing with set nets difficult in most areas	Porpoise and birds (considered above); shallow subtidal sandbanks
Récifs Gris Nez Blanc Nez	No – not sole habitat (gravel, cobble, rock)	None
Couloir des 3 estuaires	Perhaps in more offshore areas	Porpoise, birds and shad bycatch (considered above), sandbanks

Estuaire de la Seine	Perhaps in more offshore areas	Porpoise, birds and shad bycatch (considered above), sandbanks
Littoral cauchois	No – not sole habitat (rocky)	None

The evidence for the impact of fishing gear on intertidal and subtidal sand and mud areas has been considered by the UK Marine SACs project<sup>19</sup>. A list of potential impacts, which could be relevant to this fishery is given in Table 20. Possible impacts on intertidal and subtidal sand and mud habitat from this fishery are i) long-term changes to benthic community structure and ii) pollution from gear loss. The former is difficult to evaluate, but the team considered that it is more likely to occur from towed gear than from nets, which have a much more localised footprint, giving the habitat longer to recover on average between fishing events for a similar amount of fishing effort.

Gear loss, conversely, remains a problem in this fishery, although fishermen do everything possible to avoid it, or to retrieve the lost gear, since the nets are expensive (several thousand euros each). The main reason for loss of nets is other shipping activities, including trawlers and commercial shipping (noting that this fishery takes place in a very busy area for shipping). Arrêté 2883 (1 August 1969) sets out the requirements for marking gillnets, to which the fishermen habitually add luminescent bands and red and black flags at intervals along the length of the net. Unmarked gear will be removed by the authorities if found during patrols or reported by other vessels. FROM Nord report that this strategy has been successful in reducing rates of gear loss over the years, and also note that nearly all lost gear is recovered. Nevertheless, some nets are lost each year, although figures are not available as to how many.

**Table 20. Potential impacts of fisheries on inter- and subtidal sand and mud habitats, and how they relate to this fishery. Source: UK Marine SAC project<sup>20</sup>**

Impact	Relevance
Removal of non-commercially sized fish (e.g. juvenile plaice)	Yes – but considered under 2.1 – retained species
Removal of large sessile benthic fauna (e.g. urchins)	No – restricted to towed gear
Removal of infauna (e.g. by digging for worms)	No – gear do not penetrate the sediment surface
Effect of discards on ecosystem and water and sediment quality	Yes – considered under 2.5 – ecosystem
Ecosystem impact of removal of target species (e.g. effect on birds of sandeel fishery)	Yes – considered under 2.5 – ecosystem
Long-term changes to benthic community structure	Potentially, although more likely with towed gears

<sup>19</sup> See [http://www.ukmarinesac.org.uk/communities/intersand-mud/ism5\\_4.htm](http://www.ukmarinesac.org.uk/communities/intersand-mud/ism5_4.htm)

<sup>20</sup> as above

Impact	Relevance
Post-fishing mortality of organisms	No – restricted to towed gear (excluding mortality from discards, considered under 2.2 - bycatch)
Change to the physical integrity of the sediment system through scraping, digging or ploughing	No – restricted to towed gears
Change to the water column via increased re-suspension	No – towed gears
Contamination via pollution discharge, re-suspension of polluted sediment, litter and gear loss	Potentially from gear loss
Habitat loss from creation of fisheries infrastructure	Not relevant here

There are currently no management plans or measures in place specific to the SACs and SPAs. A recent requirement from the EU is to conduct appropriate assessments for fisheries in Natura 2000 areas, and to put in place management measures accordingly. This process is underway at present, with assessments being conducted by the Comités Régionaux de Pêche (Nord-Pas de Calais and Haute Normandie) and the Agence des Aires Marines Protégées (Agency for Marine Protected Areas). In the Nord-Pas de Calais region, they have started with the Banc des Flandres. They have reportedly identified that the main risk arises from a small, inshore shrimp trawl fishery, with which they are working to develop management measures for the site. For the other sites, assessments are on-going or have not yet started (Antony Viera, CRPM Nord-Pas de Calais, pers. comm.).

#### 2.4.6. Ecosystem

General background on the North Sea and Eastern Channel ecosystem can be found in numerous MSC reports, including, for example, MEC (2014), and is not repeated here in detail. To summarise briefly, the area is mainly shallow and high energy, leading to high mixing rates and hence usually no thermal stratification of the water column in summer; all this makes the ecosystem highly productive. The ecosystem is one of the most heavily fished marine ecosystems in the world; however climate has been identified by many authors as the key driver leading to changes in plankton community composition and shifts in the recruitment patterns of a number of fish species (Beaugrand, 2004; Alheit et al., 2005; Beaugrand and Ibanez, 2004). This would suggest that the ecosystem is mainly influenced by climate-driven bottom-up forces rather than predator-driven top-down forces. However, other authors (e.g. Baily and Steele, 1999) consider that climate and fisheries may interact. Two potential ecosystem impacts are identified in Table 20 above: i) the potential impact of removal of the target species, and ii) the impact of discarding on marine ecosystems.

Impacts of removing sole from the ecosystem would derive from their role (as predators or competitors or prey) in structuring the ecosystem. Sole are predators of benthic invertebrates (small crustaceans and polychaetes) and therefore do not play a role as top predators in structuring fish communities; they may affect invertebrate communities where

they are present in large numbers – there is no information available on this that we could find – but given that these communities are diverse and the species concerned are highly productive, the team considered that structuring of these communities by bottom-up and habitat factors is more likely. Sole may to some extent compete with similar species such as plaice, which show some but not total diet overlap (Hinz et al., 2005), but since these species are fished together, negative correlations in density driven by competition are likely to be smoothed out by positive correlations driven by fishing pressure. On the inshore nursery grounds, small flatfish (along with other small fish) are prey for a wide range of predators, including fish species such as bass and dogfish as well as cormorants and other diving birds; again, however, this is true of a wide variety of species (including but not limited to other flatfish species that use the same nursery grounds) and hence sole are not likely to play a key ecosystem-structuring role in these areas. In this regard, it is worth noting that ICES estimate that there is roughly 10 times more plaice than sole in terms of biomass in the eastern Channel (~81,000 t of plaice vs. ~8,000 t sole in 2015; ICES, 2015a and 2015e).

Discarded fish provide a food subsidy for a range of scavenging seabirds, mammals, fish and benthic invertebrates, and are eventually recycled into dissolved nutrients (see review in Heath et al., 2014). In the North Sea, 30-40% of trawled fish are reportedly discarded, and a recent review (Heath et al., 2014) suggests that implementing the discard ban in the North Sea without making improvements to selectivity will actually have negative impacts on these scavenger populations without having much impact on the status of exploited fish stocks. In this fishery, observer reports (Ifremer 2012, 2013 and 2015) suggest that ~15% of the catch is discarded in this fishery (18.8% - 2012, 13.3% - 2013, 16.5% - 2014), which for total landings of 1591 t from the fishery (from logbook data provided by FROM Nord) suggests discards of ~300-350 t per year. This is one tenth of the total estimate of discards of plaice alone in the eastern Channel (3181 t for 2015; ICES, 2015e), even though plaice are one of the main species discarded by the fishery (Ifremer 2012a, 2013 and 2015), suggesting that this fishery is not making a significant contribution to total discards in the area where it fishes. Most discards are likely to come from beam and perhaps otter trawls.

## 2.5. Principle Three: Management System Background

The FROM Nord sole fishery is a part of European shared fishery in the eastern Channel (VIId) and the southern North Sea (IVc); it is managed under the recently revised European Common Fisheries Policy (CFP).

### 2.5.1. Governance and policy

#### 2.5.1.1. Legal framework

The CFP Regulation<sup>21</sup> has direct effect in EU member states (MS) legal systems, but MS may introduce additional fisheries and marine ecosystems management measures at national and local levels. The CFP has 4 policy areas, Conservation, Trade, International (access agreements) and Funding (European Maritime and Fisheries Fund EMFF).

On behalf of its member states (MS), and as part of the CFP international policy area, the EU promotes better international governance and participates to the bodies established under UN Convention on the Law of the Sea (UNCLOS) and the UN Fish Stock Agreement (UNFSA), UN Conference on Sustainable Development (Rio+20), notably COFI the FAO Committee on Fisheries (Food and Agriculture Organisation) and regional fisheries management organisations (RFMOs).

The CFP commits the European Union the provision of international conventions and agreements. The most relevant for this fishery are:

- Exploitation of marine biological resources that restores and maintains populations of harvested stocks above levels that can produce the maximum sustainable yield by 2015 or no later than 2020;
- Coherence with the fisheries targets laid down in the Decision by the Conference of the Parties to the Convention on Biological Diversity on the Strategic Plan for Biodiversity 2011 – 2020, and with the biodiversity targets adopted by the European Council of 25 and 26 March 2010;
- To base the sustainable exploitation of marine biological resources on the precautionary approach, which derives from the precautionary principle referred to in the first subparagraph of Article 191(2) of the (European) Treaty, taking into account available scientific data;
- To contribute to the protection of the marine environment and in particular to the achievement of good environmental status by 2020, as set out in Article 1 of Directive 2008/56/EC of the European Parliament and of the Council (the MSFD); and
- To implement an ecosystem-based approach to fisheries management, limit environmental impacts of fishing activities, avoid and reduce unwanted catches as far as possible.

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21 Regulation (EU) No 1380/2013 of the European Parliament and the Council of 11 December 2013 on the Common Fisheries Policy

Alongside the CFP, the 'Birds' Directive 2009/147/EC of the European Parliament and of the Council<sup>22</sup>, the 'Habitat' Council Directive 92/43/EEC<sup>23</sup>, and the 'MSFD' impose certain obligations on Member States as regards special protection areas (SPA), special areas of conservation (SAC) and marine protected areas (MPA), respectively. The EU and France are parties to the OSPAR Convention for the Protection and conservation of the North-East Atlantic and its resources; France (and several other MS but not the EU) is party to the Agreement on the Conservation of Small Cetaceans in the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) since 2005.

The French fisheries management arrangements are set out in the Code rural et de la pêche maritime Livre IX: Pêche maritime et aquaculture marine revised by December 2014 application decree<sup>24</sup>. Arrangements regarding coastal and marine ecosystems are set out in the Code de l'environnement<sup>25</sup>, specifically for the EU MSFD, articles L 219-9 to L 219-18 and R 219-2 to R 219-17. The initial assessment for the Channel and North Sea sub-region (corresponding to OSPAR region II) was led by the DIRM MEMN and published in 2012 (see Table 6 for a list of French institutions and their main roles). A programme of measures has been put together, and monitoring will start in 2016 with a view to achieving good environmental status by 2020 (DIRM-MEMN, 2015).

The fisheries management regulations applying to the FROM Nord sole fishery are a mix of EU and French national and local provisions as follows:

- Landing obligation<sup>26</sup>, TACs and Quotas<sup>27</sup>;
- Quota allocations (per licensed vessel, managed by PO, not tradable);
- Netters-specific licence delivered by the CRPM Nord Pas de Calais Picardie (NPCP), Haute Normandie (HN) and Basse Normandie (BN) with cap on numbers and on overall fleet size (see Table 21). Licences are withdrawn when the vessel is sold or if its characteristics are modified and do not conform to the conditions set in the licence. The licence goes back to the CRPM after each modification, current conditions de licence are summarised in Table 21;
- European and National authorisation from French government (EU<sup>28</sup> and/or French management plan), with cap on numbers;
- EU Cod Recovery Plan<sup>29</sup>;

22 Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 20, 26.1.2010, p. 7).

23 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.7.1992, p. 7).

24 See <http://www.legifrance.gouv.fr> for latest consolidated version and application decree n° 2014-1608

25 <http://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006074220>

26 Commission Delegated Regulation (EU) 2015/2438 of 12 October 2015 establishing a discard plan for certain demersal fisheries in north-western waters

27 Council Regulation (EU) 2016/72 of 22 January 2016 fixing for 2016 the fishing opportunities for certain fish stocks

28 French fishing authorisation for North sea sole and plaice (Règlement (CE) n° 676/2007 du Conseil du 11 juin 2007 établissant un plan pluriannuel de gestion)

29 Council Regulation (EU) No 1243/2012 of 19 December 2012 amending Regulation (EC) No 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks

- Minimum gear mesh size (90mm if sole >70% of landings) (EU Regulation 850/98);
- Maximum length of net per vessel (km per metre LOA of vessel) (French management plan – see below);
- Closed areas to protect nursery grounds (French management plan).

The CRPMs, which are the licensing authorities (in substance, although the process is scrutinised by a ministerial-level consultative committee and final decisions are officialised by the NPCP and HN ‘préfet’, have specific provisions to match local conditions shown in Table 21.

**Table 21. CRPM sole fishing licensing conditions**

CRPM	Sole fishing licence specifications
NPCP Nord Pas de Calais Picardie (FR arrêté 155/2015)	<ul style="list-style-type: none"> <li>- Licence “multi-gear netter” (fileyeur polyvalent) validated annually</li> <li>- Maximum of 90 days per year for vessels using multiple gear (métiers)</li> <li>- Maximum of 41 licences per year</li> <li>- The total length of licensed vessels cannot exceed the 2013 baseline</li> </ul>
HN Haute Normandie (FR arrêtés 04 et 05/2015)	<ul style="list-style-type: none"> <li>- Licence “netter” (fileyeur) validated annually</li> <li>- Annual maximum corresponding to 637.54 m total vessel length in the fleet</li> <li>- Inside 3 nm only, driftnets maximum net length 2.5 km</li> </ul>
BN Basse Normandie (FR arrêté 40/2015)	<ul style="list-style-type: none"> <li>- Licence “netter” (fileyeur) validated annually</li> <li>- Annual maximum corresponding to 90 vessels, including 8 (10 since 2015) licences for HN vessels fishing in BN waters</li> <li>- Minimum mesh size 100mm</li> <li>- Non target species less than 30% weight, crustaceans (especially spider crabs) less than 10%,</li> </ul>

Until an official EU management plan for sole in VIId is published, the Belgian and French have agreed emergency measures, which were introduced in France from 1<sup>st</sup> February 2015<sup>30</sup>. The French management plan for VIId sole (already mentioned in 2.3.5.4) introduced the following additional measures:

- New non-transferable national fishing authorisation for all vessel catching more than 300kg of VIId sole per year
- Cap on fishing days, maximum gear size (1km per m of vessel LOA)
- Minimum landing size for sole 25cm (EU is 24cm)
- Mandatory VMS for decked vessels of all sizes
- Elimination of latent fishing capacity (based on past activity in the fishery in 2011, 2012 or 2013)
- Dragging gear banned in designated sole nursery and juvenile grounds.

30 Arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêche de la sole commune (Solea solea) en Manche Est (division CIEM VII d)

The EU multi-annual management plan for North Sea sole (and plaice, fishing area IV, Council Regulation No 676/2007), which introduced systematic TAC and fishing effort adjustments to reduce fishing mortality from 2008 (see section 2.3.6) together with landing and declaration obligations, was positively reviewed by STECF (2014a).

Finally, there is a traditional recreational netting fishery for soles on the inter-tidal from the shore, regulated by the 'départements' DDTM / DML59, DML50, 62<sup>31</sup> as follows:

- National Code of Conduct<sup>32</sup>
- Annual licences, fishery suspended between 1<sup>st</sup> June and 14<sup>th</sup> September (DML59)
- One fixed net per individual, max. length 50m, max height 2m, mesh 90mm set between two poles with clear indication of authorised individual
- Intertidal only, nets cannot be covered by water at all times, excluding bathing and other areas used for navigation or moorings, and estuaries of salmon and sea trout rivers
- annual licences are not renewed if catch information has not been returned for the first six months of previous year.

#### 2.5.1.2. Consultation, roles and responsibilities

Decisions regarding TAC, effort or landing restrictions are made at the European level, after consultation or following suggestions from the regional Advisory Councils.

At European level, the fishery is represented at two Advisory Committees the Western Waters AC (for the Channel, Area VIId) and the North Sea AC (for area IVc) through the CNPM and the PO, where they can make proposals for management measures and discuss presentations made by scientists regarding stock assessment and management measures. Both NWWAC and the NSAC are involved with this fishery, where environmental NGOs are actively involved in decisions regarding annual TAC and regulatory measures to limit the fishery's ecosystem impacts.

POs were introduced by the EU to deliver a Common Organisation of the Markets, but their role in supporting the CFP has increased in particular with the introduction of production and marketing plans in 2014.

The CRPM regroups the owners of all fishing vessels registered in the local area. Members are organised in commissions according to métiers ('fileyeurs') and their 'délibérations' provide the basis for vessel licensing and local fisheries co-management regulations. Membership of CRPM is compulsory for fishers and decisions are made by consensus and therefore the process is mostly co-operative and effective. 'Délibérations' and bylaws (arrêtés) can be appealed in an administrative tribunal.

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31 [http://www.dirm-memn.developpement-durable.gouv.fr/IMG/pdf/90-2015\\_arrete\\_peche\\_a\\_pied\\_de\\_loisir\\_sur\\_le\\_littoral\\_du\\_departement\\_59.pdf](http://www.dirm-memn.developpement-durable.gouv.fr/IMG/pdf/90-2015_arrete_peche_a_pied_de_loisir_sur_le_littoral_du_departement_59.pdf) and <http://www.groupe-fn-npdc.com/medias/files/arrete-50-2014-peche-de-loisir.pdf>

32 [http://www.developpement-durable.gouv.fr/IMG/pdf/bonnes\\_pratiques\\_et\\_reglementation\\_peche\\_de\\_loisir.pdf](http://www.developpement-durable.gouv.fr/IMG/pdf/bonnes_pratiques_et_reglementation_peche_de_loisir.pdf)

A national Fisheries Management Consultative Commission was created in December 2014<sup>33</sup> as part of the Code Rural et de la Pêche review. The Commission i) examines requests for transfer or cessation of annual vessel fishing authorisations required by international, regional or national regulations, and may be consulted regarding initial and renewal applications, and ii) gives advice to the minister on proposals regarding catch quota or fishing effort. It is headed by the Minister in charge of the fisheries and aquaculture and is made up of 6 representatives of national PO federations and 3 representatives from CNPM designated according to the meeting's agenda. A similar mixed government-industry Commission<sup>34</sup> exists at the DIRM-MEMN regional level, which examines fishing authorisations for vessels smaller than 25m.

In France, the development of operational indicators and programme of measures for MSFD Channel and North Sea sub-region (OSPAR region II) is an inclusive process, just as for the designation of the Natura2000 sites and Marine national parks. Fishing industry representatives, including small-scale operators, sit on the steering committees of MPA boards through the CRPMs.

#### 2.5.1.3. Long-term objectives

French legislation defers to the EU Common Fisheries Policy (CFP) and its clearly stated objectives (CFP Regulation 1380/2013 Article 2):

1. The CFP shall ensure that fishing and aquaculture activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and contributing to the availability of food supplies.
2. The CFP shall apply the precautionary approach to fisheries management, and shall aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels, which can produce the maximum sustainable yield. In order to reach the objective of progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, the maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks.
3. The CFP shall implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised, and shall endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment.
4. The CFP shall contribute to the collection of scientific data.

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33 DÉCRET n°2014-1608 du 26 décembre 2014 - Article D921-5 Commission consultative de la gestion des ressources halieutiques

34 DÉCRET n°2014-1608 du 26 décembre 2014 - Article D914-1 Commission régionale des pêches maritimes et de l'aquaculture marine

5. The CFP shall, in particular:

- Gradually eliminate discards, on a case-by-case basis, taking into account the best available scientific advice, by avoiding and reducing, as far as possible, unwanted catches, and by gradually ensuring that catches are landed;
- Where necessary, make the best use of unwanted catches, without creating a market for such of those catches that are below the minimum conservation reference size;
- Provide conditions for economically viable and competitive fishing capture and processing industry and land-based fishing related activity;
- Provide for measures to adjust the fishing capacity of the fleets to levels of fishing opportunities consistent with paragraph 2, with a view to having economically viable fleets without overexploiting marine biological resources;
- Promote the development of sustainable Union aquaculture activities to contribute to food supplies and security and employment;
- Contribute to a fair standard of living for those who depend on fishing activities, bearing in mind coastal fisheries and socio-economic aspects;
- Contribute to an efficient and transparent internal market for fisheries and aquaculture products and contribute to ensuring a level-playing field for fisheries and aquaculture products marketed in the Union;
- Take into account the interests of both consumers and producers;
- Promote coastal fishing activities, taking into account socio- economic aspects;
- Be coherent with the Union environmental legislation, in particular with the objective of achieving a good environmental status by 2020 as set out in Article 1(1) of Directive 2008/56/EC, as well as with other Union policies.

Regarding Principal 2, the EU Birds and Habitats Directives have been transposed provisions in the French Code de l'Environnement, as have the long-term objectives of the EU's Marine Strategy Framework Directive (MSFD) to develop a regional seas approach (Channel-North Sea) to managing the marine environment. The overall marine good environmental status (GES) for Descriptor 3 is that "Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock." The types of measures proposed to achieve GES from fisheries impacts include input controls, output controls and spatial and temporal restrictions on economic activities. The Action Plan is being finalised for the sub-region with the adoption of a programme of measures, and is expected to be implemented by end of 2016.

2.5.1.4. Incentives for sustainable fishing

FROM Nord manages its sub-national quota via individual vessel allocations based on track records. The PO attempts to accommodate temporary cessation of activity or quota overshoot through swaps, but members are penalised for overshoot, and the PO itself is penalised by the central administration (DPMA), which may be penalised by the EU. From 2014, the French authorities have asked the POs to report on their quota management for

the previous year separately by metier (including netters) for all EU quota-managed species, including quota overshoots and sanctions taken, and to submit detailed information for selected 'sensitive' species (including VIld sole) including a provisional calendar of monthly quantities to be produced and average price<sup>35</sup>.

The French fisheries management system includes clear indication at all levels (local, fishery-specific, EU) that annual fishing authorisations may not be renewed if catch statistics are not returned and generally in case of infractions, the same holds for fishing vessel licences and for PO membership. In addition, the PO has a Code of Conduct that members have to sign, and non-compliant vessels may be excluded from the MSC-certification list of vessels.

They are also regular incentives for sustainable fishing, through the support of the co-management process. The system relies on the conception and adoption of locally meaningful conservation measures, and their combination with measures to maximize market return. Budget support to the CRPMs and public grants at local and region-level and to the Pôle Aquimer (training, innovation and research) result in various projects to support data collection (including ObsMer and FilManCet) and research to inform the management plans and ecosystem impacts particularly in protected areas.

Potential perverse incentives are as follows:

- the European Maritime and Fisheries Fund (EMFF, formerly the European Fisheries Fund EFF<sup>36</sup>) public subsidies (EU and member state) for new engines and fleet withdrawal
- prix de déclenchement (formerly prix de retrait – minimum market prices)
- fuel duty exemption.

EMFF: There have been concerns in the past that previous iterations of this fund have led to overcapacity, because of subsidies towards new vessels and badly thought-out rules relating to decommissioning subsidies. The EMFF now has the following objectives (Article 5 of EU Regulation 508/2014):

The EMFF shall contribute to the achievement of the following objectives:

- promoting competitive, environmentally sustainable, economically viable and socially responsible fisheries and aquaculture;
- fostering the implementation of the CFP;
- promoting a balanced and inclusive territorial development of fisheries and aquaculture areas;
- fostering the development and implementation of the Union's internal market policy in a manner complementary to cohesion policy and to the CFP.

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35 Arrêté du 29 janvier 2014 portant répartition de certains quotas de pêche accordés à la France pour l'année 2014 <http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000028566466&categorieLien=cid>

36 [http://ec.europa.eu/fisheries/cfp/eff/index\\_fr.htm](http://ec.europa.eu/fisheries/cfp/eff/index_fr.htm)

The provision of state support and through the European Maritime and Fisheries Fund (EMFF<sup>37</sup>), is carefully scrutinized, through ex-ante, interim and ex-post evaluations and annual report from each MS to ensure that negative incentives do not arise (see Ernst and Young et al., 2011). For example, support provided by the French government in the past to mitigate fuel price increases, were deemed incompatible with EU regulations, and had to be paid back by those who had received it. Incentives that may still be provided to reduce fishing capacity ('sortie de flotte') in support of specific management plans now result in a permanent withdrawal of fishing capacity at national level.

'Prix de déclenchement': An EU programme, administered by POs provides for a minimum market price below which the product is withdrawn from the market. If the product is unsold at a price fixed by the Ministry (usually 80% of the average price over the last three years), FROM Nord will help the seller to find an option for storage of the product until the price improves. If this is not possible, the market is left to take its course. Conversely POs have a system of 'surtaxe' on quota overshoot on all quota species directly taken out of the auction market price for individual vessels, which acts as a deterrent.

Fuel tax exemption: In common with agriculture and some other professions, fishermen in the EU are able to buy diesel at a lower rate of tax than private individuals. There has been debate over whether this should be considered as a subsidy to fishing, but generally it is not.

## **2.5.2. Fishery-specific management system**

### **2.5.2.1. Fishery-specific objectives**

The long-term Management for North Sea sole (and plaice) (EC Reg 676/2007) deemed precautionary by ICES (2010) was introduced to bring the stock "within safe biological limits" in stage 1, and is "exploited on the basis of maximum sustainable yield and under sustainable economic, environmental and social conditions" in its present stage 2. The same long-term objectives are clearly stated in the Management Plan for sole in the eastern Channel (VIId) introduced by France in 2015 (see section 2.3.5.4).

Regarding P2, the EU landing obligation has clear objectives of reducing unwanted catch, waste and fishing mortality on stocks for which there is extensive discarding. The directed fishery for sole in the Channel (area VII d and e) comes under the landing obligation in 2016<sup>38</sup>. For the North Sea, sole also comes under the landing obligation from 1<sup>st</sup> January 2016, and current recommendation by the NSAC for netters in 2016 are that all catches of sole be landed, and any bycatches of Northern prawns, with a phasing in of other species to cover all catches by 2019 (Scheveningen Group, 2015).

The designation and management of numerous Marine Protected Areas (Natura2000 and Marine Park - parc naturel marin des estuaires picards et de la mer d'Opale) that overlap

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37 [http://ec.europa.eu/fisheries/cfp/emff/index\\_en.htm](http://ec.europa.eu/fisheries/cfp/emff/index_en.htm)

38 [http://www.nwwac.org/fileupload/NWWAC\\_ExCom\\_Drafting\\_Group\\_Submission\\_to\\_MS\\_Group\\_04\\_02\\_2015\\_EN.pdf](http://www.nwwac.org/fileupload/NWWAC_ExCom_Drafting_Group_Submission_to_MS_Group_04_02_2015_EN.pdf)

with the FROM Nord sole fishery set clear objectives regarding potential impacts on protected habitats and interactions with cetaceans, seabird and other ETP species.

#### 2.5.2.2. Decision-making process

The decision-making for the fishery is through a combination of EU-level and French-level processes (see 2.5.1). For the FROM Nord sole fishery, day-to-day management is shared between the PO (FROM Nord) for production and 1<sup>st</sup> sales, the CRPMs (NPCP and HN) for fishing licences and activities, the authorities (DPMA-DIRM-DDTM/DMLs for the statistics, quota uptake and compliance) and scientists (Ifremer, AAMP, universities, projects) who are also represented at national and EU levels. Local fishermen are actively involved with scientists through the French ObsMer programme and know how their information are used (or not) at local, national and European levels. Scientists are also involved in biodiversity and ecosystem surveys and management through the marine protected areas management agency (AAMP) and local MPA (SACs, SPAs) committees that actively involve members of environmental NGOs. Therefore, multi-stakeholder participation is widespread, and the absence of ENGO representatives during the site survey was interpreted as an indication of an absence of concern regarding this fishery.

The FROM Nord PO takes decisions via its board ('Conseil d'Administration'), which includes an elected member from each of the métiers in the fleet whose quota it manages. Each fishery within FROM Nord also has its own commission ('Commission') who discusses issues arising for that particular fleet and pass its conclusion and recommendations to the board.

#### 2.5.2.3. Compliance and enforcement

The legal framework for MCS of EU-registered vessels catching EU-managed stocks such as sole in VIId and IVc is the 'Control regulation'<sup>39</sup> that establishes "a Community control system for ensuring compliance with the rules of the common fisheries policy". The regulation, with direct effect in all member states, introduced from 1<sup>st</sup> January 2012, a point system for fishing licences to deter serious infringements, national registers of fishing offences against the CFP and the possibility for the Commission to close fisheries when the TAC is reached. It also compels EU MS to include effective, proportionate and dissuasive sanctions in their legislation, and ensure that the rules be respected. These provisions strengthened those of the 'IUU Regulation'<sup>40</sup>, which is improving integration of Port State Measures control systems and catch certification between member states (MRAG et al., 2014).

On the basis of a long-term risk analysis undertaken by all member states agencies concerned, the European Fisheries Control Agency (EFCA) provides capacity building and coordinates operations through the Joint Deployment Plan (JDP) in support of the NS cod

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39 Council Regulation (EC) No 1224/2009 and Commission implementing Regulation (EU) No 404/2011

40 Council Regulation (EC) No 1005/2008 of 29 September 2008, and Commission Regulation (EC) No 1010/2009 of 22 October 2009 laying down detailed rules for the implementation of Council Regulation (EC) No 1005/2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing

recovery plan in the North Sea and Western Waters, notably with the France CROSS-Étel CNSP (see below). Several campaigns targeted sole in areas VIId and IV in 2014, reports are available from the EFCA website.

The Commission has its own inspectors, who can visit national authorities at any time to check that EU rules are implemented correctly. When the Commission finds that national authorities are not enforcing CFP rules properly, the Commission may close the fishery down, and TAC overshoots are deducted from the future national share of the TAC. It may also withhold fisheries-specific funds and take the MS to the EU Court of Justice.

The fishery is technically in non-compliance with EU Regulation 812/2004 laying down measures concerning incidental catches of cetaceans in fisheries. Its main objective is to i) evaluate incidental catches through observer programmes and ii) limit these through the use of acoustic scaring devices called pingers. The regulation, which doesn't mention trammel nets specifically, required that pingers be placed on gear susceptible to catch marine mammals incidentally, for all vessels greater than 12m operating in the North Sea, Celtic Sea and Atlantic waters, including in the Channel (Area VII) throughout the year (Morizur et al., 2014). The fishery tested the pingers available and initiated a research and scientific observation project 'FilManCet' with the French national research institute Ifremer. The FilManCet study provided objective evidence i) that interactions with porpoises are extremely low in the area of operation of the fishery and ii) that pingers are unlikely to make any difference to by catch rates (ICES WGBYC, 2013, 2014 and 2015).

In recent years, as part of the French national annual report regarding Reg. 812/2004, the fishery has presented observer data to demonstrate a very low level of interactions with trammel nets in VIId (one porpoise in 2212 GTR\_Soles observed operations in area VIId between 2008 and 2013, see Morizur et al., 2014 and ICES, 2014i). Until the regulation is reviewed as part of the review of technical measures, the Commission does not enforce the compulsory pinger aspect of the regulation for a number of member states (ICES WGBYC, 2014) and the French authorities do not enforce it either (pers.com. DDTM-DML). Therefore, the de facto requirement no longer applies to this fishery. Therefore on this aspect, the team considered that there is no evidence of systematic non-compliance.

At national level, the DPMA sets out annual MCS programmes. Locally, the DIRMs fix local objectives for the each fishery and port, and the French Centre National de Surveillance des Pêches (CNSP) coordinates missions and logistics for the national MCS programme and EU co-operation through Joint Deployment Plans.

A number of government agencies come together to deliver monitoring, control and surveillance (MCS) of French coastal fisheries. For the FROM Nord sole fishery, compliance and enforcement matters are coordinated national by the CROSS-Griz Nez, and internationally by CNSP at CROSS-Étel.

The 'note technique du 2 juin 2014' regarding control of landings declarations for marine fisheries<sup>41</sup> defines control priorities for local services, obligations of skippers, of those involved in the first sale ('première mise sur le marché') and of those who transport fisheries products. It provides a summary of the different obligations and processes, in particular for the vessels in the fishery:

1. Catch declarations: 'fiche de pêche' for under 10m vessels and log-books for those over 10m (art. 14 and 15 of EC regulation 1224/2009)
2. Landing declarations (art. 23, 24 et 54)
3. Sales slips (note de vente art. 62 to 64)
4. Transfer declarations (art. 66 and 67)
5. Transport documents (art. 68).

The note aims to improve the quality of the data collected. It defines the roles of local services (for this fishery the DDTMs / DML59, DML62, DML76), the national fisheries surveillance centre (Centre national de surveillance des pêches - CNP), FranceAgrimer and the central government Directorate (DPMA - Direction des pêches maritimes et de l'aquaculture), for the control and check of these documents.

The DIRM with DDTM/DMLs establishes local Fisheries Control Plans and reports no specific concerns for the fishery. The DMLs implement government policy in marine and maritime matters. They have a dual role of collecting data in support of regulations and of controlling fishing activities and landings, and have police powers at sea and on land, extending to recreational activities, in collaboration with the Gendarmerie Maritime, Customs, Gendarmerie nationale and the French Navy (Marine Nationale). Sanctions for non-compliance may include temporary or permanent suspension of the fishing licence. The DMLs systematically crosscheck commercial catch declarations with the sales notes as these are received (within 48 hours for over-10m, and monthly for under-10m).

There is a reporting delay for recreational fishers, but their activities are tightly regulated and controlled.

The PO also has a system of measures to deter infringements regarding quota uptake, landing declarations and agreed measures to regulate market access. Sanctions to deal with non-compliance exist for the fishery and are consistently applied. According to the FROM Nord, the fishermen, the CRPM NPCP and the DML62 met during the site visit, the combination of legal prosecutions and administrative sanctions provides an effective deterrence.

Fishermen have to be member of the CRPM where their vessel is registered. There are provisions for vessels to also hold a licence with a neighbouring CRPM. For the Baie de Seine, where the CRPM boundary cuts the estuary down the middle a netter fishing inside the 12 miles will need two licences, one from Haute Normandie (HN) and one from Basse Normandie (BN). BN has provisions to allocate 8 (more recently 10) of its 90 netter licences

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<sup>41</sup> <http://circulaire.legifrance.gouv.fr/index.php?action=afficherCirculaire&hit=1&r=38395>

to vessels from HN. When fishing in BN waters, HN vessels have to comply with BN rules, in particular use 100mm mesh nets. Recently, there appears to have been some delays in the administrative licensing process from the BN side, resulting in HN vessels fishing in BN waters without a licence. The compliance competent authority, the DIRM MEMN, has been acting as a mediator between the two CRPMs, and until the issue is resolved, does not consider the temporary lack of BN licence for HN vessels as an infringement. The number of FROM Nord vessels concerned and quantities caught are small; catches and areas are reported, and no instances of non-compliance with BN rules by HN vessels fishing in BN waters have been detected. Therefore, there are no concerns about the effect of this local disagreement on the stock status, or the ecosystem, which are dealt with under Principles 1 and 2. In any case, the current lack of agreement between the two CRPMs will be resolved as they merge into one in 2017 and agree the terms of a common CRPM “Normandie” netter licence.

However, the current deadlock between CRPM HN and BN over licensing conditions need to be resolved to have a high degree of confidence that HN fishers comply in BN waters. A recommendation has been issued, for FROM Nord vessels to do all in their power for common licensing conditions to be agreed as soon as possible.

#### 2.5.2.4. Research Plan

There is no document labelled 'research plan' for the Eastern Channel sole fishery or for the North Sea sole fishery', but the team considered that there is overall an integrated and strategic approach to research for this and other fisheries, with ICES as a centre point where priorities are identified, and research being carried out for and by ICES Working Groups.

Various research surveys, data collection and data analyses are carried out as part of the assessment process for the sole stocks. There are surveys for the assessment of main retained stocks integrated and analysed by ICES, within the context of an on-going assessment and advisory process that identifies research priorities (see sections on P1 and P2 above). For other parts of the ecosystem, there has been important research into the place and role of sole and related species in the marine ecosystem. Ecosystem models of the Eastern Channel and of the North Sea ecosystems exist (Ajaulo et al., 2008; Mackinson and Daskalov, 2008) and are used to evaluate fisheries impacts.

ICES working group reports and advice reports are available online. Ifremer also publish a useful summary of all ICES's advice for the year in French, making it more accessible to stakeholders in this fishery. Release dates are set out in advance and are respected. Scientific papers are publically available for the most part, but sometimes behind a pay wall. The research plan has to be inferred from other documents and therefore cannot be described as 'widely and publically available'.

#### 2.5.2.5. Monitoring and performance evaluation of the fishery management system

As noted previously (section 2.3.6), the management plan for NS (IVc) sole devised in 2007 has evolved and is now fully implemented in its stage 2. A mixed fishery model is scheduled to replace single species stock assessment for the North Sea, Skagerrak and Eastern Channel fisheries at some stage in the future. ICES is currently analysing implications of the

transition between single and mixed-species fisheries assessment for its annual scientific advice (ICES, 2014i).

A forthcoming management plan for Eastern Channel (VIId) sole is currently being reviewed by STECF.

### 3. Evaluation Procedure

#### 3.1. Harmonised Fishery Assessment

The fishery operates on the same stocks as three other certified sole fisheries: Hastings sole (VIId), CVO sole (IV) and DFPO sole (IV). The fishery also shares some elements of the fishery-specific management system with the FROM Nord herring fishery. The scores for the relevant PIs are given below, with scores resulting in a different outcome highlighted in yellow.

PI	This fishery		Hastings sole (2012)	CVO sole (2012)	DFPO sole (2012)	FROM Nord herring (2015)
Stock	VIId	IV	VIId	IV	IV	N/A
1.1.1	90	90	80	70	70	
1.1.2	80	80	80	80	80	
1.1.3				70	80	
1.2.1	70	95	95	90	95	
1.2.2	75	90	85	80	90	
1.2.3	80	80	90	100	90	
1.2.4	90	90	90	95	90	
3.2.1	90					90
3.2.2	100					95
3.2.3	85					95
3.2.4	80					80
3.2.5	80					80

For Principle 1, substantive differences in the scoring between this fishery and the scores given in the other PCRs are:

- Lower scores leading to a condition for PIs 1.2.1 and 1.2.2 for this fishery for stock VIId, compared to the scoring of the Hastings sole fishery when it was re-certified in 2012 (Intertek, 2012a);
- A higher score is given for PI 1.1.1 for this fishery than for the CVO sole fishery (certified in 2012; Intertek, 2012b) and the DFPO sole fishery (certified in 2012; FCI, 2012).

These differences are considered in turn:

#### PI 1.2.1 for VIId

This fishery was scored down on the basis that SG80 guidepost b was not met, because although the stated objective of the harvest strategy is to fish the stock at  $F_{MSY}$ , there is

limited evidence that it is being met – i.e.  $F$  has consistently been above  $F_{MSY}$ . When the Hastings fishery was scored for re-assessment, however, based on the ICES advice for 2011, the stock was still in transition to the MSY approach, and therefore it was not necessarily to be expected that  $F$  would be at the relatively new MSY target level (since  $F_{pa}$ , the basis of the previous approach, is higher). The Intertek team also noted that  $B$  was above the target level, which remains the case.

The Hastings fishery has since changed CABs and is now audited by MEC. The Principle 1 expert is the same as for this assessment team, so harmonisation meetings were not required. The [Year 3 surveillance audit report](#) (August 2015) was based on ICES advice from 2015, and noted that the  $F$  target was not being met, and was rescored on that basis. The issue will be reconsidered at the next surveillance audit for the Hastings fishery.

#### **PI 1.2.2 for VIId**

The issue is the same here – in this fishery, it was considered that SG80 guidepost c is not met because the HCR has not been effective at keeping  $F$  at the required level (although it has for  $B$ ). Again, this PI was rescored and will also be reviewed at the next surveillance audit for the Hastings fishery.

#### **PI 1.1.1 for IV**

It is clear from Figure 10 (summary of ICES' estimated trends in  $F$  and  $B$  for this stock) that the stock status has improved since the assessment of the CVO and DFPO fisheries. These assessments were based on ICES' advice from 2011, which estimated the stock status to be below  $MSYB_{trigger}$  (29,000 t vs 37,000 t; ICES (2015b)); since 2012, however, ICES have estimated that  $B > B_{trigger}$  (ICES, 2015b). It therefore makes sense that the scores are different. Note that following their initial assessments, all conditions in relation to P1 have been closed out for both the CVO and DFPO fisheries.

For Principle 3 there are no substantive differences in scoring.

### **3.2. Previous assessments**

This fishery has not previously been assessed.

### **3.3. Assessment Methodologies**

The fishery was assessed using The MSC Certification Requirements version 1.3 and reporting template 1.0. The default assessment tree was used with no adjustments. The RBF was not used.

### 3.4. Evaluation Processes and Techniques

#### 3.4.1. Site Visits and Consultations

During the assessment process, one visit was held in Boulogne-sur-Mer, France on the 16<sup>th</sup> February 2015. The stakeholders consulted during and after the site visit are listed in Table 22 below.

**Table 22. Stakeholders consulted during and after the Boulogne-sur-Mer site visit (16-18<sup>th</sup> February 2015)**

Name	Organisation	Type of consultation
Christophe Radenne	FROM Nord	Provision of information during the site visit
Francois Hennuyer	FROM Nord	Provision of information during the site visit
Béatrice Harmel	Comité Régional de Pêche Maritime Basse Normandie	Informal discussion during an on-site consultation on a different fishery in June 2015
Antony Viera	Comité Régional de Pêche Maritime Nord-Pas de Calais	Provision of information during a telephone consultation in August 2015
Antoine Van Mackelberg	Direction Inter-Régionale de la Mer, Manche Est Mer du Nord (DIRM MEMN)	Provision of information during a telephone consultation and by email in February 2016
José Pinto	Patron of the Ophélie	Provision of information during the site visit
Nicolas Pizano	ULAM 76-27	Provision of information during the site visit
Julie Matanowski	DIRM	Provision of information during the site visit
Josephine Labat	WWF France	Provision of information during the site visit
Antoine Balazk	CRPMEM – Nord Pas de Calais	Provision of information during the site visit
Delphine Roncin	CRPMEM – Nord Pas de Calais	Provision of information during the site visit
Mme T. Decastel-Serva	DIRM	Provision of information after site visit
Margaux Favret	MSC	Observer during the site visit
Jo Gascoigne	MEC	Assessor
Chrissie Sieben	MEC	Assessor
Sophie des Clers	MEC	Assessor

Mike Pawson	MEC	Assessor (remote participation)
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#### Information obtained:

- FROM Nord: Information about the functioning and management of the fishery (operations, data gathering and analysis, management structures and responsibilities, management plans, regulations, enforcement etc.)
- DIRM MEMN: Mme J. Matanowski et Mme T. Decastel-Serva: Information on enforcement plans, sanctions and non-compliance ; M. Antoine van Mackelberg : regulatory context and on-going facilitation meetings between HN and BN CRPM - see Appendix 3
- Fisherman: Information on how the fishery operates, the gear, bycatch and interactions with ETP species
- CRPM-Nord Pas de Calais: Information on protected areas
- CRPM-Basse Normandie: Expressed their concerns about inequitable distribution of the inshore closed areas between the regions, as well as other issues – see Appendix 3 for comments subsequently submitted to MEC.

#### 3.4.2. Evaluation Techniques

**a) Media announcements:** MEC selected two media outlets: Fishing News EU and the MSC website. Fishing News EU was selected because it reaches a wide range of seafood professionals in the EU, while the MSC press release targeted a wide range of stakeholders within the sustainable seafood industry. The combination of both ensured that key stakeholders were notified of this fishery's announcement.

**b) Methodology for information gathering:** Review of data and documentation, interview of stakeholders. NB: Sub-sampling was not used in as much as all logbook data and all observer reports were reviewed. Due to quality issues with the logbook data, the observer reports (which represent a sample of the vessels involved in the fishery) were used for the assessment of 2.1 (retained species) and 2.2 (bycatch).

**c) Scoring process:** Scoring was partly completed during the site visit and partly completed afterwards. Some Principle 2 information was lacking during the site visit (for reasons outside the control of the assessment team or the client) and PIs 2.3.1 - 2.5.3 were therefore mainly scored after the site visit, by remote discussion.

The scores were decided as follows:

How many scoring issues met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half	FAIL	65	85

More than half	FAIL	75	95
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Note that where there is only one scoring issue in the SG, the issue can be partially scored – in this case the team used their judgement to determine what proportion of it was met, e.g. at the 100 level, a small part met = 85, about half met = 90, nearly all met = 95.

**d) Decision rule for reaching the final recommendation:** The decision rule for MSC certification is as follows:

- No PIs scores below 60;
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above.

The aggregate score for each Principle is calculated by taking the average score for each section followed by the average of all the section scores

**e) Scoring elements:** For Principle 1, one scoring element was considered for each UoC, i.e. North Sea sole and eastern Channel sole. The set of scoring elements were considered in the outcome PIs under retained, discarded and ETP species in Principle 2 are listed below in Table 23.

**Table 23. Scoring elements**

Component	Scoring elements	Main/Not main	Data-deficient or not
Principle 1 (target species)	UoC 1: IV sole UoC 2: VIId sole	N/A	No
Retained species	VIId plaice, IV plaice, dab, small-spotted catshark, cod, edible crab	Main	No
	See Table 12	Not main	N/A
Bycatch species	None	Main	N/A
	See Table 12	Not main	N/A
ETP species	Birds, marine mammals, allis shad, twaite shad	N/A	No

## 4. Traceability

### 4.1. Eligibility Date

The target eligibility date for this fishery have been set as the date of certification. Product caught by the vessels in the FROM Nord sole fleet after the date of certification will be eligible to enter further chains of custody. Traceability systems are already in place in the fishery as catch is caught in certified areas only (with potentially one exception – see Section 2.2.4).

### 4.2. Traceability within the Fishery

#### a) Tracking, tracing and segregation systems within the fishery

Upon removal from the fishing gear, catch is placed in open, plastic boxes by species on deck. They are removed from the deck upon landing at the quayside, but remain in their species-specific boxes through auction to the first point of sale. All vessels within the UoC complete EC fishing logbooks, detailing the estimated and actual volume of retained catch per species, gear type, as well as the time of fishing and the fishing zone by ICES statistical rectangle. These data are fed through to the central data management system (SIOP, Système d'Informations pour Organisations Producteurs) managed by the DPMA. The SIOP gathers catch, landings and sales data from logbooks, as well as the auctions (RIC, Réseau Inter Criée). FROM Nord also has their own system of tracking and validating catch and sales data, which enables the PO to verify landings data for each of their member vessels and adds to the robustness of the traceability system.

All vessels operate VMS, which is transmitted to the CROSS (Centres Régionaux Opérationnel de Surveillance et de Sauvetage). The vessels also have to send landings declarations to the CROSS two hours prior to landing their fish and are subject to at-sea and quayside inspections from local control centres (the DML (Direction Mer et Litoral) in this case) which are instructed by the CROSS. Upon landing DML inspectors will check landings for species and size, and will cross-check landings declarations with electronic logbook data (tolerance of 10% between the two).

#### b) Possibility of vessels fishing outside the unit of certification

The FROM Nord sole fishery takes place in the certified areas of IVc and VIId (southern North Sea and eastern Channel), with the entire FROM Nord sole fleet included in this assessment (see Table 2 for a list of vessels). Catches made within those areas by FROM Nord sole vessels are therefore subject to MSC certification (pending the decision to certify). The team did note (see Section 2.2.4) the catch effort of one vessel in ICES Division VIIe during the analysis of catch data. Although believed to be a data entry error, if the vessel makes other trips into Division VIIe, it would be easy to separate MSC from non-MSC catch as fishing trips are short and therefore unlikely to occur in more than one ICES statistical area on the same trip.

In the unlikely event that the trip takes place in both certified and non-certified areas, then the whole catch from that trip (Divisions VIId and VIle for example), would not be eligible to bear the MSC ecolabel and enter into further chains of custody. One copy of the logsheet accompanies the sale of fish into the auction, this allows the selling agents to confirm the catch location and therefore its MSC status for themselves. In addition, yearly catch data will be verified at subsequent surveillance audits in conjunction with VMS data.

### **c) Risk of substitution of certified products with non-certified products**

Each vessel in the UoC lands to dedicated “agents” (sociétés d’écorage) who do not take ownership of the product but facilitate the sale (the agents do not make any MSC claims and therefore do not need MSC CoC certification). It is therefore of utmost importance that the catch can be traced back to an individual vessel, which is ensured through an electronic ticketing system (when the catch is sold in boxes) or by keeping the catch in separate, marked ‘bins’. At auction, certified and non-certified sole will be sold (as not only FROM Nord sell from these locations). MSC product will therefore be further physically identified on the quayside with MSC labels on the ‘bins’ as well as the outgoing sales paperwork. On this basis, the team considers that the risk of substitution of sole caught by the UoC with sole caught by non-UoC vessels is minimal either prior to or at the point of landing. At the auctions themselves, product will be clearly marked as MSC both physically and on accompanying documentation. In Boulogne-sur-Mer all invoicing is carried out by the company SOFETRA which will be listed on the certificate. Should this fishery achieve MSC certification, a schedule of vessels will be appended to the certificate so that first buyers at the point of landing can verify the MSC status of the product.

Considering the fact that the vessels only fish for sole in UoC waters and taking into account the high level of monitoring, control and surveillance in this fishery at sea and at the point of landing (through the CROSS and DML), the audit team was satisfied that the risk of substitution between sole caught from UoC waters with sole caught from non-UoC waters is minimal.

### **d) At-sea processing of catch**

Due to the market for this species and short trip lengths, there is no processing at sea. Once removed from the fishing gear, sole remains in plastic boxes on deck until it is landed on the quayside.

### **e) Transshipment**

No transshipping takes place in the fishery.

### **f) Points of landing**

There are five eligible points of landing; all of which are located in France:

- Boulogne-sur-Mer

- Cherbourg
- Dieppe
- Dunkerque
- Fecamp
- Port-en-Bessin

FROM Nord carry out quayside control of catch; for example checking that PO rules and regulations are respected and also quality control of product.

#### **4.3. Eligibility to Enter Further Chains of Custody**

Based on the above information, the assessment team considered the traceability management systems operated by the FROM Nord vessels, FROM Nord itself and the organisations involved in the MCS in this fishery to be sufficiently robust to meet the MSC fisheries traceability requirements up to the point of landing.

Sole caught in the North Sea and Eastern Channel (ICES Divisions IVc and VIIId) by the vessels shown in Table 2 and after the date of certification will be eligible to enter further chains of custody, pending the outcome of this evaluation. The company SOFETRA, involved in the invoicing of MSC sole at first sale, as well as the auctions at Dunkerque, Boulogne, Dieppe, Fécamp, Port-en-Bessin and Cherbourg, are all eligible to sell sole caught by this fishery as MSC certified, pending the successful outcome of this evaluation.

Separate chain of custody will be required after the first change of ownership. If fish are caught in both certified and non-certified areas on the same trip, the whole trip will be designated as non-MSC catch.

#### **4.4. Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to Enter Further Chains of Custody**

There are no IPI stocks in this fishery.

## 5. Evaluation Results

### 5.1. Principle Level Scores

**Table 24: Final Principle Scores**

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	IV sole – 89.4 Vllld sole – 81.9
Principle 2 – Ecosystem	82.7
Principle 3 – Management System	92.3

### 5.2. Summary of PI Level Scores

**Table 25. Summary of PI level scores for the FROM Nord trammel net sole fishery in ICES Subarea IV (UoC 1) and Division Vllld (UoC 2)**

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Score IV (UoC 1)	Score Vllld (UoC 2)
One	1	Outcome	0.5	1.1.1	Stock status	90	90
				1.1.2	Reference points	90	80
				1.1.3	Stock rebuilding	N/a	N/a
		Management	0.5	1.2.1	Harvest strategy	95	70
				1.2.2	Harvest control rules & tools	90	75
				1.2.3	Information & monitoring	80	80
				1.2.4	Assessment of stock status	90	90
Two	1	Retained species	0.2	2.1.1	Outcome	85	
				2.1.2	Management	85	
				2.1.3	Information	85	
		Bycatch species	0.2	2.2.1	Outcome	80	
				2.2.2	Management	80	
				2.2.3	Information	80	
		ETP Species	0.2	2.3.1	Outcome	80	
				2.3.2	Management	80	
				2.3.3	Information	80	

		Habitats	0.2	2.4.1	Outcome	80
				2.4.2	Management	80
				2.4.3	Information	85
		Ecosystem	0.2	2.5.1	Outcome	90
				2.5.2	Management	80
				2.5.3	Information	90
	Three	Governance and policy	0.5	3.1.1	Legal and customary framework	95
				3.1.2	Consultation, roles & responsibilities	95
				3.1.3	Long term objectives	100
				3.1.4	Incentives for sustainable fishing	100
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	90
				3.2.2	Decision-making processes	100
				3.2.3	Compliance & enforcement	85
				3.2.4	Research plan	80
				3.2.5	Management performance evaluation	80

### 5.3. Summary of Conditions

Two performance indicators scored below 80. These were PI 1.2.1 (Harvest strategy) and PI 1.2.2 (Harvest control rules & tools). Further details are provided in Appendix 1.2.

**Table 6: Summary of Conditions**

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1	The actions necessary to achieve the stated long-term (MSY) objectives for the VIlId sole stock need to be clearly defined via a management plan or by some other suitable method, in order to provide evidence that the harvest strategy can achieve its objectives (SG80 scoring issue b).	1.2.1 (VIlId)	N/A
2	Controls on the exploitation rate should be better aligned with the status of the VIlId sole stock, and there need to be define biomass and fishing mortality management targets that are mutually	1.2.2 (VIlId)	N/A

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
	consistent, in order to provide evidence that the tools in use are effective in achieving the exploitation levels required under the harvest control rules (SG80 scoring issue c).		

## 5.4. Recommendations

**Table 26. Summary of Recommendations**

Recommendation number	Recommendation	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1	For FROM Nord vessels to do all in their power for common licensing conditions to be agreed as soon as possible between CRPMs HN and BN to provide a high degree of confidence that fishers comply with the management system (SG100 scoring issue c).	3.2.3	N/A

## 5.5. Determination, Formal Conclusion and Agreement

Following consideration of all stakeholders' inputs and comments to the Public Comment Draft Report (PCDR), the fishery assessment team concludes that the fishery should be certified against the MSC standard. This Final Report determination remains a recommendation pending the completion of the formal objections process and the final certification decision by the MEP official decision making entity.

### (REQUIRED FOR PCR)

1. The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

## 5.6. Changes in the fishery prior to and since Pre-Assessment

There have been no particular changes to the fishery since pre-assessment, which was completed relatively recently (2014).

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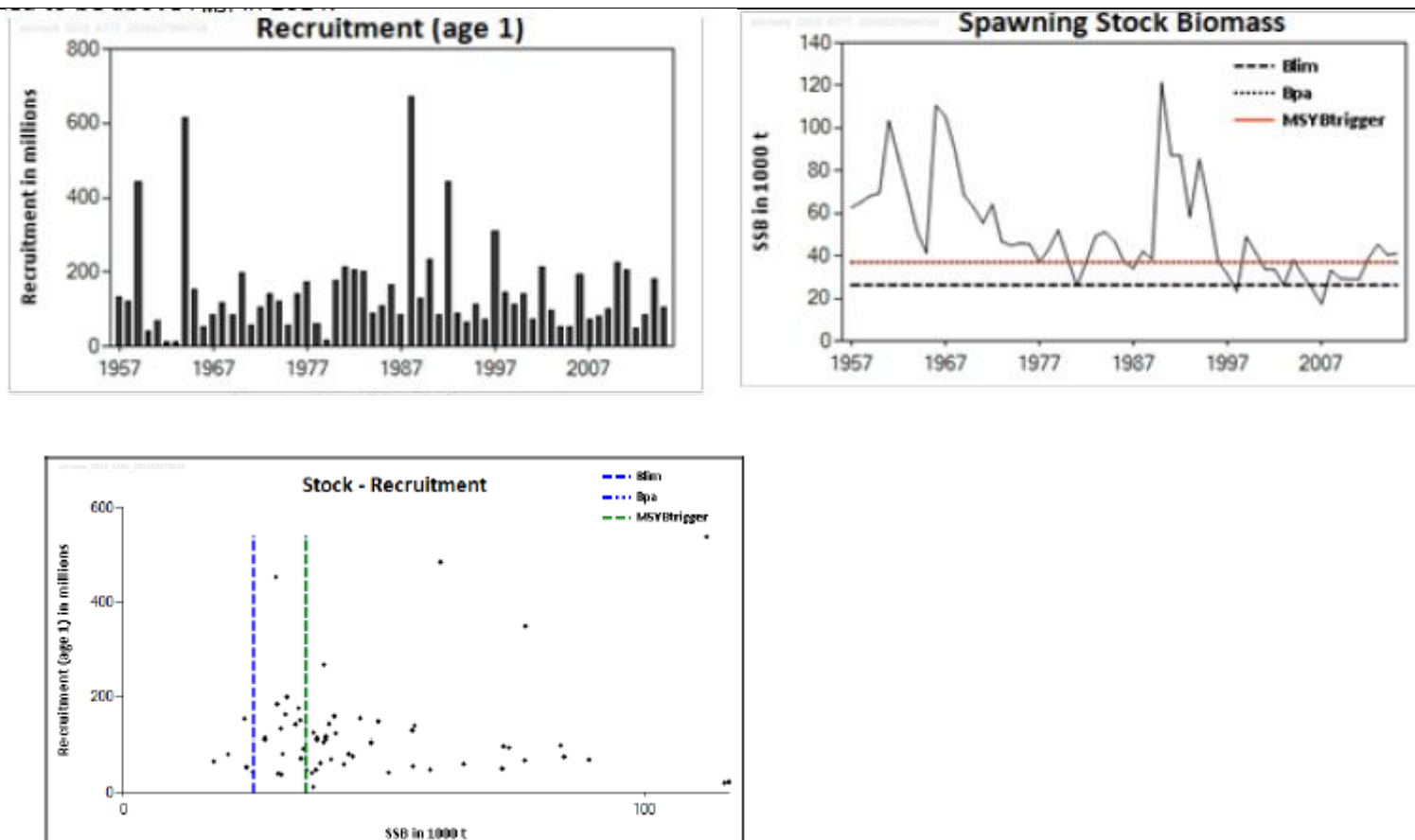
## Appendix 1 Scoring and Rationales

### Appendix 1.1 Performance Indicator Scores and Rationale

#### PRINCIPLE 1 – UoC 1: Sole NORTH SEA STOCK (IV)

Evaluation table 1 - PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	<p>ICES' assessment of the sole population in the North Sea (Subarea IV) shows an overall decreasing trend in SSB since 1990, with increases as a result of above-average recruitment (in 1992, 1997 and 2006 for example), though SSB has been increasing since 2007. ICES estimates that the SSB of sole in the North Sea has been above <math>B_{pa}/MSYB_{trigger}</math> (37,000 t) since 2012. <math>B_{pa}</math> is set at <math>1.4 \times B_{lim}</math>, which is based on the lowest point in the time series (<math>=B_{loss}</math>) (see figure below). SSB in 2015 was estimated by the stock assessment at 41,137 t, which is 18% above <math>B_{pa}/MSYB_{trigger}</math>.</p> <p>The underlying year class strength throughout the time series has been relatively consistent. ICES does not provide probabilistic estimates of stock status in relation to reference points in the advice or working group report. The team considered, however, that given that i) SSB is ~65% above <math>B_{lim}</math>, at which there is no particular evidence of recruitment impairment (see stock-recruit figure below), ii) recruitment has fluctuated without trend over the times series (see figure), and iii) 2014 recruitment was estimated at 182 million one-year-olds, which is 'considerably higher' than the geometric mean over the time series (see figure), according to ICES, then there was a high degree of certainty that the stock is above the point at which recruitment would be impaired. SG60a, 80a and 100a are met</p>		



Figures: Top: time series of recruitment and of SSB; bottom: stock-recruit relationship.

b	Guide post		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	N
	Justification	<p>Target reference points are set by the management plan for the stock, as follows:</p> <p><math>SSB_{MP} = MSYB_{trigger}</math> which defaults to <math>B_{pa} = 37,000</math> t (increased from 35,000 at 2015 benchmark; <math>SSB_{2015} = 41,137</math> t  <math>F_{MP}</math> (for management plan stage 2) = 0.22; estimate of <math>F_{MSY}</math> recently revised from 0.22 to 0.2 (see below); <math>F_{2014} = 0.255</math>  As noted above, SSB is currently estimated to be above the SSB target in the management plan (<math>B_{pa}/MSYB_{trigger}</math>), and has been 'fluctuating around' this level since 2008, although it dipped below <math>B_{lim}</math> in 2007 (see figure in scoring issue a above). The management plan stage 1 (recovery plan, now at an end) has been successful in bringing F down from well above <math>F_{pa}</math> to <math>\sim F_{MP}</math> (in 2014 it was estimated to be <math>\sim 16\%</math> above – the lowest since the 1960s).</p> <p>(Note that the most recent estimate of <math>F_{MSY}</math> has diverged from <math>F_{MP}</math> further due to reviews in 2014 and 2015 by WKMSYREF3, WKLIFE and the benchmark by WKNSEA. It appeared to the team, based on a review of all these reports except WKLIFE 2015 which is not yet available, that the selected value of <math>F_{MSY}</math>, and indeed the previous value (<math>F_{MP}</math>) are precautionary, and it is unclear for the moment why this value has been selected for <math>F_{MSY}</math>; at all events, estimating MSY reference points for this stock is clearly very problematic).</p> <p>In relation to whether the stock is at <math>B_{MSY}</math>, the team noted that WKNSEA provide a range of estimates for median SSB at <math>F_{MSY}</math> (48,000-68,000 t, median 52,000 t), but this was without the inclusion of <math>B_{trigger}</math> and based on very uncertain estimates of <math>F_{MSY}</math> (see Section 2.3.6 of the main report) – the team therefore considered that it was not appropriate to put too much weight on these figures in scoring – noting that ICES have not attempted to provide an estimate for <math>B_{MSY}</math> for this stock).</p> <p>Overall, the team concluded that since the stock was above the biomass management plan target and close to the fishing mortality target, and SG80b is met.</p> <p>In relation to SG100b, there is arguably a high degree of certainty that the biomass is above the target level (taking <math>SSB_{MP}</math> as a target), but this is not the case for the fishing mortality target, which has only recently fallen to slightly above the target (MSY) level. Therefore SG100 is not met.</p>		

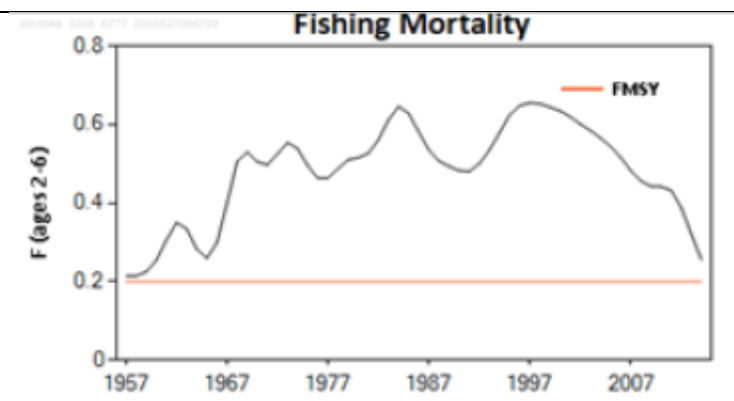


Figure: Time series of  $F$ , with new  $F_{MSY}$  in red;  $F_{MP}$  is slightly higher (0.22).

References	ICES, 2015b		
	ICES, 2015c		
	ICES, 2014h.		
	ICES, 2015d		
	ICES, 2014b		
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Conventional limit Reference Point	B <sub>lim</sub>	26,300 t	SSB <sub>2015</sub> /B <sub>lim</sub> = 41137/25000 = 1.56
Precautionary Reference Point	B <sub>pa</sub> (MSYB <sub>trigger</sub> ) (1.4xB <sub>lim</sub> ) F <sub>pa</sub> (5%ile F <sub>loss</sub> , ~50% probability of maintaining B at B <sub>pa</sub> )	37,000 t 0.4	SSB <sub>2015</sub> /B <sub>pa</sub> = 1.11 F <sub>2014</sub> /F <sub>pa</sub> = 0.255/0.4 = 0.64
MSY reference point	new F <sub>MSY</sub> (as re-estimated by WKLIFE)	0.2	F <sub>2014</sub> /new F <sub>MSY</sub> = 1.28
Target	SSBMP = B <sub>pa</sub> (prior to 2015 benchmark)	35,000 t	F <sub>2014</sub> /F <sub>MP</sub> stage 2 = 1.16

Reference Point in harvest control rule	$F_{MP}$ (stage 1) = $F_{pa}$ as above $F_{MP}$ (stage 2) = $F_{MSY}$ (prior to 2015 benchmark	0.4 0.22	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>

Evaluation table 2 - PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	<p>Reference points for North Sea sole initially established by ICES in 1998 were reviewed in a benchmark assessment in 2010 (WKFLAT 2010) and again in 2015 (WKNSEA 2015). The estimation of <math>F_{MSY}</math> has clearly been problematic and has been revised several times by different groups (WKMSYREF3 2014, WKNSEA 2015, WKLIFE 2015); the value adopted by WGNSSK in 2015 (0.2) apparently derives from WKLIFE (2015), and the details are not yet available.</p> <p>ICES' derivation of reference points for IV sole is set out in Table 9. <math>B_{lim}</math> is defined by a segmented regression on the SR relationship. <math>B_{pa}</math> is set at a level of SSB that will ensure that the stock remains above the level below which recruitment could be impaired with a high probability, and this value (previously 35,000 t, now 37,000 t) has been adopted as <math>MSYB_{trigger}</math>. The trigger biomass in the management plan (SSBMP) remains for the moment at 35,000 t since the re-estimate of <math>B_{lim}</math> and <math>B_{pa}</math> is recent (WKNSEA 2015).</p> <p><math>B_{MSY}</math> is not estimated directly, but <math>F_{MSY}</math> has been estimated by ICES following various methodologies and with various input assumptions (see Section 2.3.6). Although the outcome is very variable depending on input assumptions (notably the model used to fit the stock-recruit relationship), the value of 0.22 in the management plan has been accepted as providing both a low risk of stock collapse and high long-term yields. The <math>F_{MSY}</math> estimate retained by ICES has recently been revised to 0.2, but ICES continues to provide advice based on <math>F_{MP}</math>.</p> <p>SG60a and 80a are met.</p>		
b	Guide post		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	Y
	Justification	<p>ICES has defined <math>B_{lim}</math>, the SSB level below which there is a raised probability of impaired recruitment, as the breakpoint in a hockey-stick fit to the SR relationship (see Figure 11 in the main report). This change in definition (from <math>B_{loss}</math> – the lowest point in the time series), resulted in a small increase in <math>B_{lim}</math> from 25,000 t in 26,300 t in 2015. The stock-recruit relationship suggests that this is above the level at which there is an appreciable risk of recruitment failure. SG80b is met. In relation to SG100, the team considered that this estimate of <math>B_{lim}</math></p>		

PI 1.1.2		Limit and target reference points are appropriate for the stock		
		is precautionary, since the stock has recovered from below this level in the past, and since there is not much evidence for any kind of SR relationship - noting that high biomass values have resulted in both some of the highest and some of the lowest year classes in the time series, as ICES notes. SG100b is met.		
c	Guide post		The target reference point is such that the stock is maintained at a level consistent with $B_{MSY}$ or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with $B_{MSY}$ or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	N
	Justification	<p>Since the North Sea sole (and plaice) stocks have both been within safe biological limits in the last three years, the stocks are presently in stage two of the EU multiannual plan (see 1.2.1 harvest strategy below). This calls for management in line with the principles of MSY, implying that fishing mortality be reduced to 0.22 (estimate of <math>F_{MSY}</math> prior to 2015), which was estimated based on the median of a stochastic MSY analysis assuming a Ricker stock–recruit relationship (range of 0.2–0.25).</p> <p>As noted above, <math>B_{MSY}</math> cannot be directly estimated with any confidence, and hence <math>MSYB_{trigger}</math> (the target biomass reference point under the MSY framework) defaults to <math>B_{pa}</math>, which is estimated in relation to <math>B_{lim}</math>. Nevertheless, <math>F_{MSY}</math> is estimated directly, and while the estimate is uncertain, the value retained as a target reference point in the MSY management plan has been considered to be consistent with high long-term yields from the stock as well as low risk. Hence SG80c is met. The management plan considers both sole and plaice and, though ICES in their 2012 review question the extent to which it is possible to meet MSY objectives for both stock all the time, it is evident that both stocks are being managed to achieve high biomass (North Sea plaice is at an historic high) and <math>F_s</math> that are close to <math>F_{MSY}</math>. There is no evidence, however, that wider precautionary issues such as the ecological role of the stock have been taken into account in this analysis. Hence SG100c is only partially met.</p>		
d	Guide post		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		N/A	
	Justification	Not applicable		

<b>PI 1.1.2</b>	<b>Limit and target reference points are appropriate for the stock</b>	
<b>References</b>	ICES ACFM (1998), ICES (2012), ICES (2014a, 2014b), WKFLAT (2010), ICES (2010), Coers et al. (2012), ICES (2012a), STECF (2014a)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

Evaluation table for PI 1.1.3 – not applicable, only scored if PI 1.1.1 60-80

Evaluation table 3 - PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Guidepost</b>	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	There is a harvest strategy in place, set out in a management plan (Council Regulation (EC) No. 676/2007), which has been reviewed several times and found to be precautionary and consistent with MSY objectives. The management plan is intended to move SSB progressively towards $B_{MSY}$ in two stages. The first stage aims at an annual 10% reduction of $F$ until $F_{MSY}$ (0.22 as estimated at the time) is reached, with a maximum change in TAC of 15% until the precautionary reference points are reached for both plaice and sole for two successive years. Recent advice from ICES (ICES, 2014) indicates that the North Sea sole (and plaice) stocks have both been within safe biological limits in the last three years, invoking stage two of the EU multiannual plan (STECF, 2014). This calls for management in line with the principles of MSY, implying that fishing mortality be reduced to 0.22. In 2015, ICES re-estimated $F_{MSY}$ at 0.2, but the ICES (2012) review of proposed changes to the management plan evaluated $F_{MP}$ in the range 0.2-0.25, and found that this made little different to the overall risk profile (i.e. the risk of $B$ dropping below $B_{lim}$ ). The team concluded that SG100a is met.		

<b>b</b>	<b>Guidepost</b>	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The performance of the harvest strategy has been fully evaluated by ICES and STECF (see, for example, ICES (2010 and 2012); STECF 2014). Between 2007 and 2013, F was estimated to have fallen by about 50% in line with the strategy for an annual reduction of 10% and F is now close to <math>F_{MSY}</math>, although not yet at it (NB: ICES have just re-estimated <math>F_{MSY}</math> but this is not yet reflected in the management plan). Nevertheless, <math>F_{2014}</math> (0.255) is estimated at a value, which is, according to ICES, likely to be consistent with the precautionary approach (or at least, close – ICES evaluated 0.2-0.25). The stock has been above <math>MSYB_{trigger}</math> since 2011. SG80 is met.</p> <p>Although the evidence suggests that the harvest strategy is successfully maintaining the stock at around MSY and precautionary levels, it is not completely clear that the harvest strategy will be able to reduce F to at or below <math>F_{MSY}</math>, particularly now that the estimate of <math>F_{MSY}</math> has been revised downwards. ICES recommended a small reduction in the TAC to bring F down to <math>F_{MP}</math> (-4.5%), but this change was not implemented. ICES, however, are recommending no change in the TAC in 2016 from the 2015 level. The team, however, noted that changes in the distribution of fishing effort has resulted in an increase in the effort in the southern North Sea where sole are predominantly found and this, together with developments in gear technology (such as electric pulse fishing), could increase targeting of sole and may affect the medium-term impact of the strategy. In view of this, the audit team considered that SG100 is not fully met.</p>		
<b>c</b>	<b>Guidepost</b>	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	<b>Met?</b>	Y		
	<b>Justification</b>	Annual landings, technical measures, SSB, fishing mortality and compliance with the annual TAC are all well monitored, and the TAC is enforced through national legislation. Technical measures are rigorously enforced through at sea inspections and inspections at the point of landing. ICES estimated landings exceeded the TAC slightly in 2014, but prior to that were at or below the TAC since 2008 (see Figure 5 of main report). Met.		
<b>d</b>	<b>Guidepost</b>			The harvest strategy is periodically reviewed and improved as necessary.
	<b>Met?</b>			Y

	<b>Justification</b>	The harvest strategy was fully evaluated by ICES in 2008 and re-evaluated in 2010 (ICES, 2010e) and provisionally accepted as precautionary for sole. Some proposed changes were evaluated in 2012, and in 2013, ICES evaluated the effects of inter-annual quota flexibility (of 10% in terms of the probability of the stock biomass falling below $B_{lim}$ , and average yield); concluding in both cases that the management plan is robust, conditional on the inter-annual quota flexibility being suspended when the stock is estimated to be outside safe biological limits (ICES, 2013b). STECF also evaluated in the management plan in 2014. SG100 is met.		
<b>e</b>	<b>Guidepost</b>	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	<b>Met?</b>			
	<b>Justification</b>	Not applicable		
<b>References</b>		ICES, 2015b STECF, 2014 ICES, 2010e; ICES, 2012; ICES, 2013b		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 4 - PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	The HCR is clearly defined in the EU management plan for North Sea flatfish (Council Regulation (EC) No. 676/200). The main mechanisms are annual TACs and limits on days at sea. In stage two of the EU multiannual plan, the TAC is determined in line with the principles of MSY, ( $F_{MP}=0.22$ ), which should ensure that SSB will remain above precautionary levels and give a high long-term yield (according to evaluations of the management plan). In addition to the catch (TAC) control, fishing effort in the North Sea is restricted by days-at-sea regulations to protect cod, which allocate days on the basis of gear, mesh size and catch composition. The current plan prescribes effort limitations (kW-days per métier) to be adjusted in line with changes in fishing mortality. The HCR ensures that the exploitation rate is reduced as limit reference points are approached (i.e. target F is reduced when $B < B_{trigger}$ ). SG60 and 80 are met.		
b	Guide post		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	Y
	Justification	The use of precautionary biomass and mortality reference points (uncertainties in the assessment), and the EU multiannual plan covering both plaice and sole (uncertainties in how fishing effort is deployed), ensure that the main uncertainties are considered in the HCR. This meets SG80. There are uncertainties around the estimated values of MSY reference points ( $F_{MSY}$ variable depending on model; $B_{MSY}$ not estimated), although it appears that the value of $F_{MSY}$ used for $F_{MP}$ is sufficiently conservative (see rationale for 1.1.2) to take this uncertainty into account. The evaluations of the management plan suggest that it is robust to such factors as inter-annual TAC constraints and a range of values of F somewhat above $F_{MP}$ . On this basis, the team considered that the management plan has been designed to be robust to a wide range of uncertainties, and SG100 is met.		

PI 1.2.2		There are well defined and effective harvest control rules in place		
c	Guide post	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	Though F on sole in the North Sea has not fallen as sharply as for plaice, since 2007 there has been a strong recovery of sole biomass and the required reduction in fishing mortality has been more or less achieved (see rationale for 1.1.1 above). In relation to maintaining biomass above $B_{trigger}$ , the evidence clearly shows that the management plan has achieved this (SG100 is met). The 2015 TAC was not reduced by the small percentage that exploitation at $F_{MP}$ required, conversely ICES (2013) have evaluated the management plan as robust to inter-annual TAC constraints when the biomass is above $B_{trigger}$ , and do not advise a reduction in 2016, so this should have no impact on the effectiveness of the strategy. Overall, the team concluded that the evidence indicates that the harvest control tools are appropriate and effective in achieving appropriate exploitation rates, but that the evidence does not 'clearly show' this, because F has not yet reached the F target. SG100 is not fully met.		
References		EC Council Regulation No. 2056/2001; EC Council Regulation No 676/2007; EC Council Regulation 40/2008; Council Regulation (EC) No. 40/2008; STECF, 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				N/A

Evaluation table 5 - PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	<p><i>Stock identity:</i> The geographical range of sole stocks is well described for the North Sea and eastern English Channel and immigration and emigration between these areas is sufficiently well described for stock assessment and stock management purposes. Environmental information related to sole distribution and migration has been collected and studied over many years. A wealth of data has also been collected as a result of extensive planktonic egg surveys, which show the distribution of spawning areas and likely recruit pathways.</p> <p><i>Stock productivity:</i> Regular routine sampling of all landings provides sufficient information on the age related growth changes. Important information on maturity is obtained from research vessel surveys and is kept under regular review in assessing the age structure of the spawning stock (currently knife edged recruitment to maturity at age 3 is used for assessment and management purposes). Information on the stock and recruitment relationship is updated retrospectively from the assessment once the strength of a particular year class can be firmly established.</p> <p><i>Fleet composition :</i> The composition of the fleets exploiting sole in the North Sea is complex and ranges from small inshore vessels using fixed gear to the large beam trawlers. The activities of each sector are well monitored and described and are kept under annual review by the ICES assessment working group. Similarly the types of gear in use are also well known and described at national levels. All of this information is used to inform and in support of the technical measures which form a part of the harvest strategy.</p> <p><i>Stock abundance:</i> There are three fishery-independent beam-trawl surveys that provide data to support the assessment of stock abundance. The assessment is also supported by landings per unit of effort data monitored from one commercial beam-trawl fleet.</p> <p><i>Fishery removals:</i> Landings data are accurately recorded at national level and are biologically sampled by Belgium, France, The Netherlands and the UK at levels that comply with current EC regulation requirements. With sampling as a part of the fishery-independent bottom trawl surveys this provides data on the age and sex structure of the stock. The ICES assessment working group have access to confidential data which allows for corrections in the assessment to be made to any misreporting of landings, though this is now considered to be less of an issue than previously. Similarly underreporting of catches by some elements of the inshore fleet is now considered to be a minor issue. The information on fishery removals is sufficient for management of the fishery via the annual TAC and also adequate for</p>		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		<p>stock assessment purposes. Discarding of sole in the North Sea fisheries is monitored and, though not negligible, is accommodated within the assessment. This is kept under review.</p> <p>All of the relevant information listed above satisfies the requirements of this scoring issue at SG60 and SG80, and is sufficiently comprehensive in terms of stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information to partially satisfy SG100a (including data from egg surveys and the environment that is not currently directed to the harvest strategy but does provide valuable background knowledge of the basic biology of the species). Nevertheless, as noted above, there are some significant lacunae in knowledge, including the role of environmental factors in recruitment and stock productivity, which are still to be addressed, so SG100 is not fully met.</p>		
b	Guide post	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N
	Justification	<p>ICES use commercial LPUE data, estimates of discards and several survey indices to evaluate the stock. They also have age-structure data (commercial and survey) and some maturity data. The stock is assessed and advice provided annually and the assessment is benchmarked periodically (most recently in 2015). This is sufficient to support the HCR and SG80 is met.</p> <p>WKNSEA (2015) reviewed the uncertainties in the data. Discarding is estimated, and changes in catchability by the Dutch beam-trawl fleet (due to the introduction of 'sum wings' and pulse trawls) was evaluated by the benchmark, who concluded that that Dutch beam-trawl LPUE, previously used for tuning the assessment model, had to be excluded since 2010; the 'pulse' LPUE time series is currently too short but may be incorporated in future. On this basis, the team concluded that there is a good understanding of inherent uncertainties in the information the whole fishery, which is complex in terms of both the fleets and the multiplicity of gear types taking sole, and the robustness of the assessment and management to this uncertainty required to satisfy SG100. However, it is uncertain whether ICES' interpretation of the stock assessment in terms of reference points and management are robust to this uncertainty (see 1.1.2), and SG100 is not fully met.</p>		
c	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		Y	

<b>PI 1.2.3</b>		<b>Relevant information is collected to support the harvest strategy</b>	
	<b>Justification</b>	Information is provided by all the fleets who exploit the stock (see <b>Figure 7</b> above), which are all EU fleets. There is no significant recreational catch. Discards are estimated by ICES and incorporated into the assessment (ICES, 2015d). The SG is met.	
<b>References</b>		WKNSEA, 2015; ICES, 2015b; ICES, 2015c	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>

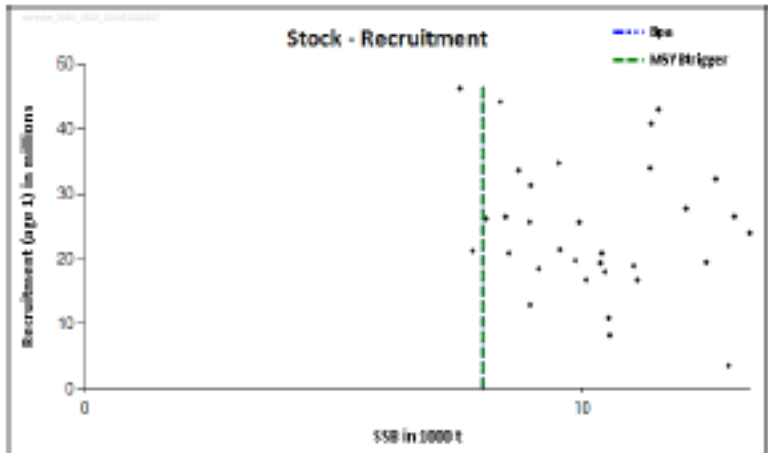
Evaluation table 6 - PI 1.2.4

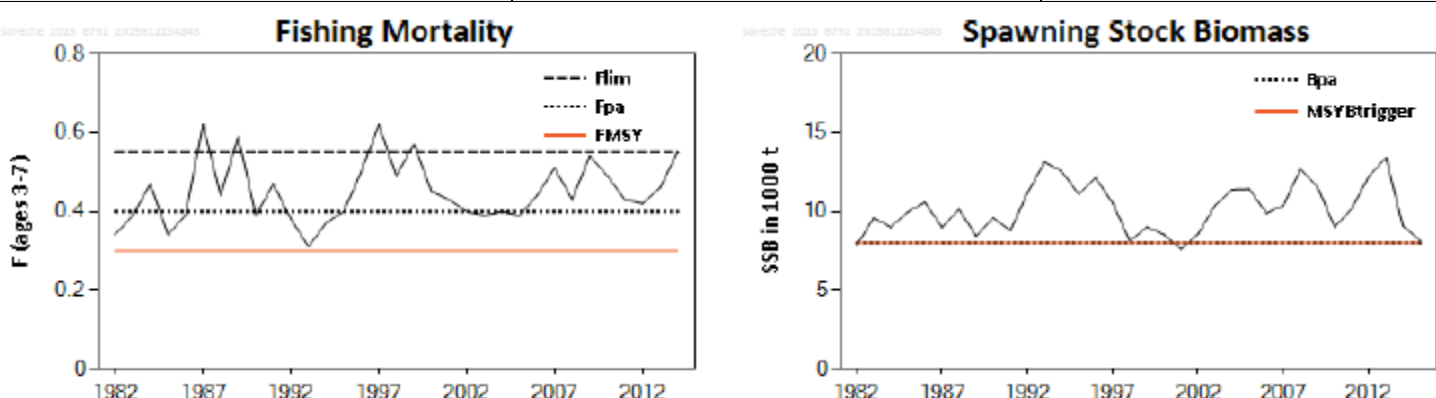
PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y
	Justification	The ICES WGNSSK uses an age-based analytical (XSA) model to assess the stock status of North Sea sole, which is in scientific data category 1 (stocks with full analytical assessments and several year classes contributing to the fishery). The assessment uses ages and length frequencies of sole in commercial catches, by metier, and abundance indices from Netherlands beam trawl metier, and from three third-quarter beam trawl surveys (ISIS, SNS and DFS). The assessment assumes natural mortality to be constant and maturity at age to be knife edged at age 3, although the benchmark reviewed different options. The assessment estimates stock status relative to reference points (biomass and fishing mortality) and the major sources of uncertainty are identified and taken into account. Though discards are known to be approximately 20% by weight in recent years for a large part of the fishery, and may be increasing, a usable time-series of discard data is not yet available, but discards are incorporated into the assessment since the recent benchmark (see WKNSEA 2015). The assessment takes into account the major features relevant to the biology of sole and the nature of the fishery, and is used for catch forecasts and advice to managers in relation to the HCR (essentially TAC control of F against reference points). SG100 is met.		
b	Guide post	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	See 1.1.1 and 1.1.2 above		
c	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	N

PI 1.2.4		There is an adequate assessment of the stock status		
	<b>Justification</b>	The recent benchmark (WKNSEA 2015) evaluated sources of uncertainty in the data, assessment and reference points. They concluded that the use of different assessment models (XSA vs. SAM) does not make a big difference, but proposed some changes in the data used to reduce uncertainty (e.g. changes to the LPUE tuning time series as described in 1.2.3 above, improvements in how discards are estimated). The benchmark includes uncertainty – e.g. in estimates of reference points – by providing an upper and lower as well as median value, and by carrying out some sensitivity analyses (although limited). The 2015 assessment (ICES, 2015d) considers uncertainty in the assessment, e.g. via retrospective analyses of the assessment results. On this basis, SG80 is met. ICES do not, however, evaluate stock status relative to reference points in a probabilistic way, so SG100 is not met.		
<b>d</b>	<b>Guide post</b>			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	<b>Met?</b>			N
	<b>Justification</b>	The assessment has been tested and shown to be robust through a stock benchmark in 2010 (ICES, 2010b) and 2015 (ICES, 2015d). However, neither explored different stock assessment approaches in any detail (see ICES, 2015d for details). SG100 is not met.		
<b>e</b>	<b>Guide post</b>		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	The stock assessment is subject to peer review through the normal ICES quality assurance process (SG80 in met). It was externally peer-reviewed by STECF in 2014.		
<b>References</b>		STECF, 2014b; ICES, 2015c; ICES, 2015d; ICES, 2010b		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

# PRINCIPLE 1 – UoC 2: Sole EASTERN CHANNEL STOCK (VIId)

Evaluation table 7 - PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	<p>ICES' assessment of the sole population in the eastern Channel (Div. VIId) shows a generally upward trend in SSB since 1982, with increases as a result of above-average recruitment (in 1990-1992, 2002, 2006 and 2010 for example), though two recent year classes (2011 and 2012) are estimated to be the weakest in the time series. Preliminary indications from the French young fish survey suggest that the 2013 year class is ~average. SSB has been above <math>B_{pa}</math> and <math>MSYB_{trigger}</math> (8,000 t) since 2002, based on which ICES consider that the stock is at 'full reproductive capacity'. Fishing mortality (F) has varied without a trend and has been above <math>F_{MSY}</math>, which is set at a level below any observed in the time series.</p>  <p>Stock-recruit plot for Eastern Channel sole (ICES, 2014a).</p> <p>As shown in the figure above, <math>B_{pa}</math> is set at a point on the stock-recruit plot at which there is no evidence of recruitment impairment. ICES note that there is 'a less than 5% probability that SSB will decrease to <math>B_{pa}</math> in the short term due to the strong 2008 and 2009 year classes'</p>		

		(WGNSSK report 2015, Section 9.8), and all catch forecast scenarios in the 2015 ICES advice indicate SSB in 2017 to be well above $B_{pa}$ (a catch of ~ 4000 t in 2016 -> SSB of 8800 t in 2017). On this basis, the team concluded that there is a high degree of certainty (defined as 95% probability) that the stock is above the point where recruitment would be impaired. SG60, SG80 and SG100 are met.		
b	Guide post		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	N
	Justification	 <p>Trends in fishing mortality (left) and SSB (right) in relation to reference points (ICES, 2015a).</p> <p>Reference points are defined for the fishery in terms of <math>F</math> (<math>F_{lim}</math>, <math>F_{pa}</math> and <math>F_{MSY}</math>, which are poorly defined) and SSB (<math>B_{pa}</math> and <math>MSYB_{trigger}</math> set at the same level) – details given in PI 1.1.2 below. There is no management plan to provide other official targets, so ICES provides advice based on the MSY approach – i.e. taking <math>F_{MSY}</math> as the target. However, the team noted that estimates of <math>F</math> reference points are very uncertain, according to ICES. The team also noted that the MSC standard prefers biomass reference points where available (CB2.3.2.3: <i>In some cases, in the absence of explicit biomass targets used for managing a stock, the biomass target or limit reference point for scoring PI 1.1.2 or pre default tree PI equivalents can be implied from fishing mortality reference points, or other proxies, adopted in the management strategy.</i>)</p> <p>The team therefore considered that <math>F_{pa}</math>, <math>F_{MSY}</math> and <math>B_{pa}/B_{trigger}</math> represent target reference points for the purpose of this scoring. The biomass is estimated to be close to <math>MSYB_{trigger}/B_{pa}</math> in 2015, but is not considered likely to fall below it in the short term (see above). Given that <math>B_{trigger}</math> is intended to represent the lower bound of <math>B_{MSY}</math> (i.e. the point that 'triggers' management action under the MSY framework), and</p>		

		given that the biomass has been fluctuating above this level (i.e. within the bounds compatible with MSY), the team considered that SG80 is met. For SG100, although the stock has been above the biomass target over recent years (2002-2014) but F has been above both $F_{pa}$ and $F_{MSY}$ since ~2006. On this basis concluded that SG100 is not met in full.	
References		ICES (2015a, 2015c)	
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Limit Reference Point	$F_{lim}$	0.55	$F_{2014}/F_{lim} = 1$
Precautionary Reference Point	$B_{pa} / MSYB_{trigger}$ $F_{pa}$	8,000 t 0.4	$SSB_{2014}/B_{pa} = 8143/8000 = 1.02$ $F_{2014}/F_{pa} = 1.38$
Target Reference Point in harvest control rule	$F_{MSY}$ (under MSY framework)	0.3 (updated from 0.29 during 2014)	$F_{2014}/F_{MSY} = 1.83$
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			N/A

Evaluation table 8 - PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	<p>ICES derivation of reference points for VIId sole is summarised in Table 7</p> <p><i>Biomass reference points</i></p> <p>ICES has not defined <math>B_{lim}</math>, the limit SSB level below which there is a raised probability of impaired recruitment, but has defined <math>B_{pa}</math> (the precautionary level of SSB that will ensure that the stock remains above the level below which recruitment could be impaired with a high probability) as the lowest SSB level observed in the assessment time series (<math>B_{loss}</math>). This is an unusual procedure for ICES, but ACFM took into account the short time series and low spread of values for defining the stock-recruit relationship, as well as an apparent increase in recruitment at the lower values of B in the time series, and concluded that there was a very low risk of recruitment failure at biomass values around <math>B_{loss}</math>. The team considered that this is an appropriate approach. <math>MSYB_{trigger}</math> (rounded to 8,000 t) was subsequently defined based on <math>B_{pa}</math> – WKFRAME (2011) acknowledge that this is a short-term solution to implementing the MSY approach, but lack data (noting the poorly-defined stock-recruit relationship) to define a reference point based on <math>B_{MSY}</math>.</p> <p><i>Fishing mortality reference points</i></p> <p>Fishing mortality reference points have been set as <math>F_{pa} = 0.4</math>, which implies a ~10% probability that SSB will fall below <math>B_{pa}</math>; and <math>F_{MSY} = 0.3</math>, which is based on stochastic simulations of the assessment assuming a smooth hockey-stick stock/recruitment relationship. Note that <math>F_{MSY}</math> is set at a level below any observed in the time series, but forms the basis for ICES advice under the MSY approach. <math>F_{lim}</math> is set at <math>F=0.55</math>, and ICES note that this is the F level above which the stock biomass has shown a decline in the past.</p> <p>Although the interpretation of the MSY biomass target (at <math>B_{pa}</math>) is not consistent with many other assessments, including North Sea sole (see below), it appears to be well above the point at which recruitment would be impaired (see rationale for PI 1.1.1 above), and management advice is provided based on <math>F_{MSY}</math>, which is set at a more precautionary (see below). The team therefore concluded that the reference points are appropriate for the stock and can be estimated with sufficient precision to act as a basis for precautionary management advice.</p>		

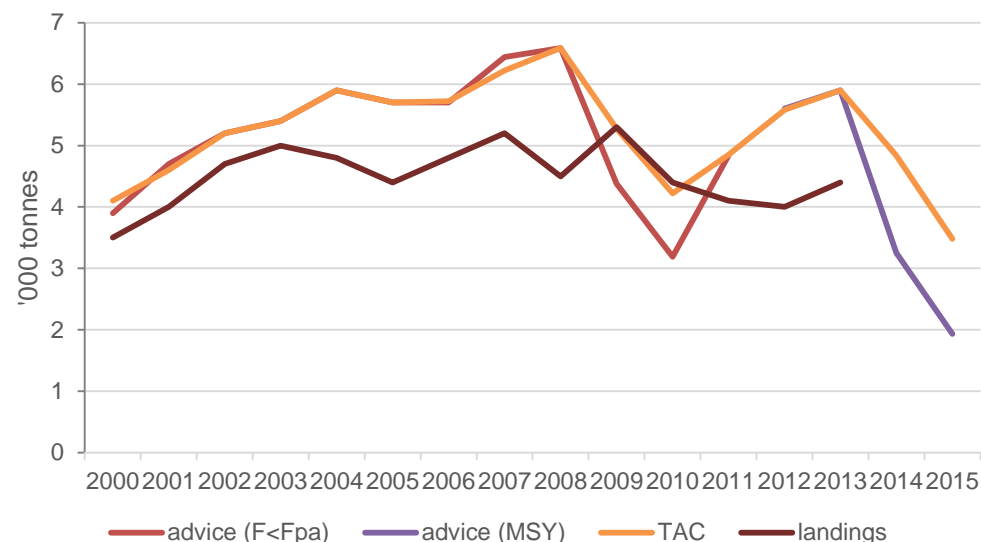
<b>b</b>	<b>Guide post</b>		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	<b>Met?</b>		Y	N
	<b>Justification</b>	A biomass limit reference point has not been defined, because $B_{loss}$ , which would conventionally define $B_{lim}$ , was considered by ICES to be far from any point at which there was a risk of recruitment impairment (ICES 1998a), and hence was used to define $B_{pa}$ (and subsequently $MSYB_{trigger}$ ) rather than $B_{lim}$ . $F_{lim}$ is based on a poorly defined stock-recruit relationship, but it is below the highest points in the time series and below the initial estimate of $F_{loss}$ by ICES (ICES 1998b). On this basis, the team considered that $F_{lim}$ is set below the level of $F$ at which there is a significant risk of impairing reproductive capacity in the short term, although fishing the stock at $F_{lim}$ over a long period would run such a risk, as would normally be the case for an $F$ -based limit reference points (however, management is in place to avoid this possibility – see below). The team considered that SG80 was met, but that uncertainty around estimates of reference points and the stock-recruit relationship preclude SG100 being met.		
<b>c</b>	<b>Guide post</b>		The target reference point is such that the stock is maintained at a level consistent with $B_{MSY}$ or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with $B_{MSY}$ or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	<b>Met?</b>		Y	N
	<b>Justification</b>	As noted above, there is a disconnect between the estimation of $B_{pa}/MSYB_{trigger}$ and $F_{MSY}$ , in that $B_{pa}$ is estimated on the basis of sustaining the reproductive capacity of the stock, and $MSYB_{trigger}$ as a ‘trigger’ to management action under the MSY framework, whilst $F_{MSY}$ is estimated so as to act as a target reference point such that the stock is maintained at a level consistent with $B_{MSY}$ or a similar outcome. Here we take the target reference point to be $F_{MSY}$ , since this is the basis for management advice provided by ICES. SG80 is met. There is no evidence that estimation of the target takes into account precautionary issues such as the ecological role of the stock with a high degree of certainty, and various issues around the stock’s dynamics and its assessment (e.g. stock-recruit relationship, mixing with North Sea stock) are uncertain. SG 100 is not met.		
<b>d</b>	<b>Guide post</b>		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	<b>Met?</b>		n/a	

	<b>Justification</b>	Not a key LTL stock
<b>References</b>	ICES (2015a,c), ICES (2011), ICES (1998a,b)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

# Evaluation Table for PI 1.1.3 – not applicable, only scored if PI 1.1.1 60-79

## Evaluation table 9 - PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	N
	Justification	<p>MSC defines the elements of a harvest strategy as:</p> <ul style="list-style-type: none"> <li>- Information</li> <li>- Stock assessment</li> <li>- Harvest control rule</li> <li>- Management actions.</li> </ul> <p>The harvest control rule, information and stock assessment are considered individually in detail below.</p> <p>The management strategy is based on an annual TAC and technical measures linked to defined reference points for SSB and F. Although there is no formal management plan for VIId sole, the management system aims to maintain SSB above the precautionary level through control of fishing mortality, which is reduced as limit reference points are approached (see PI 1.2.1 above). The ICES advice defines the options, in terms of a range of fishing mortalities and the consequences for SSB in the short term, and clearly informs all elements of the harvest strategy.</p> <p>Taking the TAC as the key element of the harvest strategy (since it is how the stock assessment is translated into management actions via the harvest control rule), the responsiveness to the state of the stock is shown in the figure below. It is clear that the TAC been varied to respond to ICES' advice, which is based on estimates of the biomass level (lower biomass = lower TAC). On this basis, it is responsive to the state of the stock (SG80).</p>		



Advice, TAC and landings for VIId sole (data from ICES, 2015a) ICES advice has been based on two different harvest strategies: keeping  $F < F_{pa}$  (up to 2010), and the MSY transition/approach (2012 onwards); 2011 was a transitional year. ICES provide advice on the level of the TAC based on i) a stock assessment derived from fisheries and survey information and ii) the MSY framework. The TAC has followed ICES advice except for 2009, 2010, 2014 and 2015. In these years, the reductions in the TAC based on the ICES advice and the actual reductions in the TAC are shown in the table below (calculated from data in ICES advice 2015).

Year	% change in ICES advice relative to previous year's TAC	% change in TAC relative to previous year
2009	34 %	20 %
2010	40 %	20 %
2014	45 %	18 %
2015	60 %	28 %

On this basis, although there is no formal management plan, the team concluded that the Fisheries Council (who decide the TAC annually) are following a de facto management plan along the lines of : follow ICES advice but with a (downwards) TAC constraint

		<p>of ~20%, except where a larger decrease might be warranted (e.g. in 2015). This type of rule is common across many European fisheries with formalised management plans.</p> <p>On this basis, the team concluded that the elements of the harvest strategy (information, stock assessment, management framework including reference points and a TAC constraint, scientific advice, management decision-making) work together to achieve stock management objectives (see PI1.1.1 for an evaluation of whether objectives are being achieved in relation to stock status). SG80 is met.</p> <p>Since there is no formal management plan, and since the apparent TAC constraint (as shown by the table above) is not written down anywhere as far as the team could establish, the team concluded that it was not reasonable to conclude that the management strategy was 'designed'. SG100 is not met.</p>		
<b>b</b>	<b>Guidepost</b>	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	<b>Met?</b>	Y	N	N
	<b>Justification</b>	<p>Well-enforced TACs and effective technical measures have a good track record in maintaining SSB at or above the defined precautionary level for this stock (see rationale for PI1.1.1).</p> <p>Evaluation of the performance of the harvest strategy is an integral part of the formulation of the annual advice on the stock from ICES (ACOM) and the eventual agreement on the annual TAC by the EC Fisheries Council. SSB in 2015 (8143 t) is estimated to be slightly above <math>MSYB_{trigger}</math>, and it is not forecast to drop below <math>MSYB_{trigger}</math> (8000 t) in 2017 under any of the management scenarios set out by ICES in their 2015 advice, largely because of two large year classes entering the fishery.</p> <p>Conversely, fishing mortality has been estimated to be above the <math>F_{pa}</math> (0.4) since 2006 and is well above <math>F_{MSY}</math>, which is the formal target reference point (see rationale for PI1.1.2 above). For 2016, ICES advice following the MSY approach is to reduce <math>F</math> to 0.3, which is expected to lead to an SSB of 10,036 t in 2016 and a TAC of 2376 t (in the absence of the landings obligation). For 2015, the MSY approach implied a TAC of 2706 t, but the TAC for 2015 was set at 3483 t (a reduction in TAC of 28% rather than the 60% proposed by ICES). This resulted in an estimated <math>F(2015)</math> of 0.55 (Flim) and if the TAC were kept stable would result in an estimated <math>F(2016)</math> of 0.48 (below Flim but still above <math>F_{pa}</math> and <math>F_{MSY}</math>). A further 15% reduction in the TAC would result in <math>F(2016)=0.39</math>, i.e. below <math>F_{pa}</math> (but still above <math>F_{MSY}</math>).</p> <p>Overall, the harvest strategy is working, in the sense that the TAC follows ICES advice but subject to a de facto inter-annual TAC constraint (as is common for EU stocks), and although <math>F</math> is higher than the target level, the biomass is above the trigger reference point and predicted by ICES to increase in the short term, with a low risk of it falling below <math>MSYB_{trigger}</math> (see rationale for PI1.1.1). On this basis, SG60 is met.</p> <p>In relation to SG80, although biomass objectives are being met, it appears that MSY objectives (i.e. <math>F_{MSY}</math>) cannot be met by</p>		

		management of the stock as it is at present. Despite the fact that the MSY approach has been the basis of scientific advice since 2012, F has consistently been well above $F_{MSY}$ . The team concluded that SG80 is not met.		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Annual landings, technical measures, SSB, fishing mortality and compliance with the annual TAC are all well monitored, and the TAC is enforced through national legislation. Technical measures are rigorously enforced through at sea inspections and inspections at the point of landing. ICES estimated landings have not exceeded the TAC significantly since 1996 (see figure given in scoring issue a). Met.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	All elements of the harvest strategy are kept under regular review by the ICES assessment working group, by the ICES advisory committee (ACOM) and by the scientific and technical committee of the EC (STECF), and improved as necessary. The harvest strategy for this stock proposed by the NWWAC currently under review by STECF, with the objective of establishing a formal management plan. France and reportedly Belgium (according to the NWWAC and French authorities) have put additional management measures in place in 2015, responding to concerns about higher than target F, as well as two small year classes in 2012 and 2013. However, there is as yet no evidence that these measures have actually reduced F and thus improved the harvest strategy, so the team concluded that this is not met (see comments from Peer Reviewer 1).		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	N/A	N/A	N/A
	Justification	The target species is not a shark		
References		ICES (2015a,c) EC Regulation 850/1998, EC Regulation 2015/104, EC Regulation No. 676/2007		

	NWWAC, 2015. Advice on management strategy for sole VIId French Arrêté du 3 avril 2015 modifiant l'arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêche de la sole commune (Solea solea) en Manche Est (division CIEM VII d)
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	<b>70</b>
<b>CONDITION NUMBER:</b>	<b>1</b>

**Evaluation table 10 - PI 1.2.2**

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	<p>The annual TAC is set on the basis of advice from ICES, which is based on the MSY approach given the state of the stock in relation to reference points that are set with the explicit purpose of maintaining a fully reproductive stock and a sustainable fishery on that stock. The MSY approach sets the TAC at a level to correspond with <math>F_{MSY}</math> when <math>B</math> in the following year is predicted to be at or above <math>MSYB_{trigger}</math>; when it is below, it sets a TAC at a lower <math>F</math>, with <math>F</math> reduced in proportion to <math>B_{(next\ year)}/MSYB_{trigger}</math> (see ICES advice 2015 for the former, 2014 for the latter). The TAC is set in agreement with ICES advice, except with a de facto TAC constraint of 20% (28% in 2015). The limit reference point is defined as <math>F_{lim}</math>; <math>F(2015) = F_{lim}</math>, but if the TAC is set according to the MSY approach for 2016, <math>F(2016)</math> will be <math>F_{MSY}</math> (i.e. 0.3); a reduction of 15% results in <math>F=0.39</math> and a stable TAC in <math>F=0.48</math> – i.e. all below <math>F_{lim}</math>.</p> <p>The allocation of national shares through the European Commission's CFP is effective and well understood nationally and at local levels through producer organisations etc. Enforcement of technical measures, in particular the minimum landing size and mesh size controls, and effort controls also support control of the exploitation rate. The TAC has not been exceeded by landings within the last ~20 years, and the stock has remained above the precautionary biomass level.</p> <p>On this basis, the team concluded that the harvest control rule is i) well-defined (although there is no formal management plan); ii) consistent with the harvest strategy (i.e. the MSY approach with a TAC constraint) and iii) ensures that the exploitation rate is reduced as the limit reference point is approached. SG80 is met.</p>		

<b>b</b>	<b>Guide post</b>		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	<b>Met?</b>		Y	N
	<b>Justification</b>	The main uncertainties that affect the HCR have been the levels of underreporting and misreporting between adjacent areas. These uncertainties in the overall catch have reduced in recent years and they are taken into account in the stock assessment process that underpins the setting of the annual TAC. Discards have also been taken into account in the assessment since 2014. SG80 is met. However, there is no evidence that a wide range of uncertainties has been explored in relation to the HCR. Some fundamental uncertainties about the stock remain; e.g. drivers of recruitment, stock-recruit relationship – these were considered in relation to the definition of reference points (see PI1.1.2) but are not well understood. SG100 is not met.		
<b>c</b>	<b>Guide post</b>	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	<b>Met?</b>	Y	N	
	<b>Justification</b>	<p>A TAC was first set for this stock in 1987. The annual landings as assessed by ICES, taking into account area misreporting, have been below the TAC since 1997 with the exception of 2010 when the TAC was exceeded by 190t. The TAC has a good track record of maintaining SSB above <math>MSYB_{trigger}</math>; ICES estimate that there is a low risk of B dropping below <math>MSYB_{trigger}</math> for 2016-17.</p> <p>To complement the TAC there are also technical measures in force, including a minimum landing size of 24cm, a minimum mesh size of 80mm for beam and otter trawls, and 100mm for trammel nets (90mm if landing &gt;70% sole). There are also effort controls implemented through the cod recovery plan and the sole and plaice long-term management plan (Council Regulation (EC) No. 676/2007) in form of limitations on effort (kW-days) by EU demersal gears in the North Sea and Eastern Channel. Overall effort has been substantially reduced since the implementation of these two management plans (–38% between 2003 and 2013, –17% between 2008 and 2013). Effort by the beam trawl fleet in small mesh size (80–120 mm, BT2) category, that targets sole, has shown a sharp decline (–52% between 2004 and 2013).</p> <p>Overall, given that biomass is successfully being maintained above <math>MSYB_{trigger}</math> and effort has been controlled and reduced in recent years, the team considered that SG60 is met. However, the harvest control rules (TAC and other) have not so far been successful at bringing the exploitation rate down to the target level (<math>F &gt; F_{MSY}</math>). Therefore, SG80 is not met.</p>		
<b>References</b>		ICES (2015a,c)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>75</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>2</b>

Evaluation table 11 - PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	<p><i>Stock identity:</i> The geographical range of sole stocks is well described for the eastern English Channel and the neighbouring areas in the southern North Sea and western English Channel. Immigration and emigration between these areas is sufficiently well described for stock assessment and stock management purposes. Environmental information related to sole distribution and migration has been collected and studied over many years. A wealth of data has also been collected as a result of extensive planktonic egg surveys that show the distribution of spawning areas and likely recruit pathways.</p> <p><i>Stock productivity:</i> Regular routine sampling of all landings provides sufficient information on growth changes. Information on maturity is obtained from research vessel surveys and is kept under regular review in assessing the age structure of the spawning stock (currently knife edged recruitment to maturity at age 3 is used for assessment and management purposes). Information on the stock and recruitment relationship is updated retrospectively from the assessment once the strength of a particular year class has been established.</p> <p><i>Fleet composition :</i> The composition of the fleets exploiting sole in the English Channel is complex and ranges from small inshore vessels using fixed gear to the large beam trawlers. The activities of each sector are well monitored and described and are kept under annual review by the ICES assessment working group. Similarly, the types of gear in use are also well known and described at national levels. All of this information is used to inform and support the technical measures, which form a part of the harvest strategy.</p> <p><i>Stock abundance:</i> There are three fishery-independent surveys available to support the assessment of stock abundance. Two of those surveys are young fish surveys and only cover age one fish; the other is a bottom trawl survey and covers fish age 1 – 6 years. The assessment is also supported by landings per unit of effort data monitored from two independent commercial fleets.</p> <p><i>Fishery removals:</i> Landings data are accurately recorded at national level and are biologically sampled by Belgium, France and the UK at levels that comply with current EC regulation requirements. With sampling as a part of the fishery-independent bottom trawl surveys this provides data on the age and sex structure of the stock. The ICES assessment working group have access to confidential data, which allows for corrections in the assessment to be made to the landings data for misreporting into and out of ICES Division VIIId, though this is now considered to be less of an issue than previously. Similarly underreporting of catches by some elements of the inshore fleet is now considered to be a minor issue. The information on fishery removals is sufficient for management of the fishery via the annual TAC and also adequate for stock assessment purposes. Discarding of sole in the Eastern Channel flatfish fisheries is monitored and as a result of</p>		

		<p>the mesh size regulation is considered to be negligible. This is kept under review.</p> <p>All of the relevant information listed above satisfies the requirements of this scoring issue at SG60 and SG80, and is sufficiently comprehensive in terms of stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information to partially satisfy SG100a (including data from egg surveys and the environment that is not currently directed to the harvest strategy but does provide valuable background knowledge of the basic biology of the species). Nevertheless, as noted above, there are some significant lacunae in knowledge, including the role of environmental factors in recruitment and stock productivity, which are still to be addressed, so SG100 is not fully met.</p>		
<b>b</b>	<b>Guide post</b>	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule. SG60b and 80b are met. However, it is doubtful whether the high frequency and a high degree of certainty level required to satisfy SG100b is achieved across the whole fishery, which is complex in terms of both the fleets and the multiplicity of gear types. There is also some doubt whether ICES' interpretation of the stock assessment in terms of reference points ( $B_{pa}/MSY_{trigger}$ is, unusually, at $B_{loss}$ ; $F_{MSY}$ ) might result in reductions in landings with no gain in stock sustainability and whether management is robust to this uncertainty, and SG100b is not met.		
<b>c</b>	<b>Guide post</b>		There is good information on all other fishery removals from the stock.	
	<b>Met?</b>		Y	
	<b>Justification</b>	As described above		
<b>References</b>		ICES, 1965; ICES, 2011a; ICES, 2015a ; Pawson, 1995.		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 12 - PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y
	Justification	The ICES WGNSSK uses an age-based analytical (XSA) model to assess the stock status of VIId sole, which is in scientific data category 1 (includes stocks with full analytical assessments and several year classes contribute to the fishery). The assessment uses ages and length frequencies of sole in commercial catches, by métier, and abundance indices from Belgium and UK beam trawlers, and from the UK beam-trawl survey and UK and French young fish surveys. The assessment assumes natural mortality to be constant and maturity at age to be knife edged at age 3. The assessment takes into account the major features relevant to the biology of sole and the nature of the fishery SG60 a, SG80 a and SG100a are met.		
b	Guide post	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	The assessment estimates stock status relative to reference points (biomass and fishing mortality) as described above, and is used for catch forecasts and advice to managers in relation to the HCR (essentially TAC control of F against reference points). SG60b is met		
c	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	N
	Justification	The major sources of uncertainty are identified and taken into account (historic misreporting of sole between the western and eastern Channel; discards are estimated and low). SG60c and 80c are met. However, the assessment evaluates stock status relative to reference points in a deterministic and not a probabilistic way, and SG100c is not met.		

PI 1.2.4		There is an adequate assessment of the stock status		
d	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	The assessment has been tested and shown to be robust through a stock benchmark in 2009, but it is unlikely that alternative hypotheses and assessment approaches (other than VPA catch-at-age models) have been rigorously explored.		
e	Guide post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y
	Justification	The stock assessment is subject to peer review through the normal ICES quality assurance process (SG80c in met). ICES advice is also periodically peer-reviewed by STECF (e.g. in 2014)		
References		ICES (2015c), STECF (2014b)		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				N/A

Evaluation table 13 - PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species																							
Scoring Issue		SG 60	SG 80	SG 100																					
a	Guide post	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.																					
	Met?	Y	Y	P (depends on species – see table below)																					
	Justification	Based on an analysis of observer data (ObsMer), main retained species have been identified as: plaice (eastern Channel stock and North Sea stock), dab, small-spotted catshark, cod and edible crab.																							
		<table><tr><th>Stock</th><th>Main retained species are highly likely to be within biologically based limits? (SG80a)</th><th>Score</th></tr><tr><td>Plaice VIId</td><td>SSB above and F below reference points; high recruitment in recent years. High degree of certainty that above TRPs. See Figure 10 and Figure 11 of main report.</td><td>100 met</td></tr><tr><td>Plaice IV</td><td>SSB above reference points; <math>F_{2014} \sim F_{MSY}</math>. High degree of certainty that <math>SSB &gt; TRP</math>; F at TRP. See Figure 12 and Figure 13 of main report.</td><td>100 met</td></tr><tr><td>Dab IV (VIId assumed to be part of same stock – see Section 2.4.2.3)</td><td>Highly abundant. Survey indices show variation without trend since the early 80s (start of standardised survey). ICES provide advice on TAC based on data-limited stocks framework; landings below ICES' advised maximum. Team concluded that stock is 'highly likely' to be within biologically-based limits because biomass and recruitment apparently stable and exploitation is at a sustainable rate. Data-limited stock precludes SG100 being met.</td><td>80 met</td></tr><tr><td>Small-spotted catshark IV+VIId</td><td>2012 advice still stands – exploitation rate decreasing and survey abundance index has increased significantly since ~2000. Team concluded that 'highly likely' to be within biologically-based limits on this basis, but since data-limited stock, SG100 cannot be met.</td><td>80 met</td></tr><tr><td>Cod IV+VIId</td><td>Since start of cod recovery plan, F has decreased and SSB increased dramatically. Latest ICES assessment (2015) estimates that F is below levels not seen since the 1960s, although it is still slightly higher than <math>F_{MSY}</math>; SSB is above <math>B_{lim}</math> but not yet at <math>MSYB_{trigger}</math>. The stock is 'likely' be within biologically-based limits in that <math>B &gt; B_{lim}</math>, but not 'highly likely' (<math>B &lt; B_{trigger}</math>, <math>F &gt; F_{MSY}</math>). Considered further under scoring issue c.</td><td>Scored under scoring issue c</td></tr><tr><td>Edible crab Channel</td><td>(Note: see evaluation of stock structure in Section 2.4.2.6)</td><td>80 met</td></tr></table>			Stock	Main retained species are highly likely to be within biologically based limits? (SG80a)	Score	Plaice VIId	SSB above and F below reference points; high recruitment in recent years. High degree of certainty that above TRPs. See Figure 10 and Figure 11 of main report.	100 met	Plaice IV	SSB above reference points; $F_{2014} \sim F_{MSY}$ . High degree of certainty that $SSB > TRP$ ; F at TRP. See Figure 12 and Figure 13 of main report.	100 met	Dab IV (VIId assumed to be part of same stock – see Section 2.4.2.3)	Highly abundant. Survey indices show variation without trend since the early 80s (start of standardised survey). ICES provide advice on TAC based on data-limited stocks framework; landings below ICES' advised maximum. Team concluded that stock is 'highly likely' to be within biologically-based limits because biomass and recruitment apparently stable and exploitation is at a sustainable rate. Data-limited stock precludes SG100 being met.	80 met	Small-spotted catshark IV+VIId	2012 advice still stands – exploitation rate decreasing and survey abundance index has increased significantly since ~2000. Team concluded that 'highly likely' to be within biologically-based limits on this basis, but since data-limited stock, SG100 cannot be met.	80 met	Cod IV+VIId	Since start of cod recovery plan, F has decreased and SSB increased dramatically. Latest ICES assessment (2015) estimates that F is below levels not seen since the 1960s, although it is still slightly higher than $F_{MSY}$ ; SSB is above $B_{lim}$ but not yet at $MSYB_{trigger}$ . The stock is 'likely' be within biologically-based limits in that $B > B_{lim}$ , but not 'highly likely' ( $B < B_{trigger}$ , $F > F_{MSY}$ ). Considered further under scoring issue c.	Scored under scoring issue c	Edible crab Channel	(Note: see evaluation of stock structure in Section 2.4.2.6)	80 met
Stock	Main retained species are highly likely to be within biologically based limits? (SG80a)	Score																							
Plaice VIId	SSB above and F below reference points; high recruitment in recent years. High degree of certainty that above TRPs. See Figure 10 and Figure 11 of main report.	100 met																							
Plaice IV	SSB above reference points; $F_{2014} \sim F_{MSY}$ . High degree of certainty that $SSB > TRP$ ; F at TRP. See Figure 12 and Figure 13 of main report.	100 met																							
Dab IV (VIId assumed to be part of same stock – see Section 2.4.2.3)	Highly abundant. Survey indices show variation without trend since the early 80s (start of standardised survey). ICES provide advice on TAC based on data-limited stocks framework; landings below ICES' advised maximum. Team concluded that stock is 'highly likely' to be within biologically-based limits because biomass and recruitment apparently stable and exploitation is at a sustainable rate. Data-limited stock precludes SG100 being met.	80 met																							
Small-spotted catshark IV+VIId	2012 advice still stands – exploitation rate decreasing and survey abundance index has increased significantly since ~2000. Team concluded that 'highly likely' to be within biologically-based limits on this basis, but since data-limited stock, SG100 cannot be met.	80 met																							
Cod IV+VIId	Since start of cod recovery plan, F has decreased and SSB increased dramatically. Latest ICES assessment (2015) estimates that F is below levels not seen since the 1960s, although it is still slightly higher than $F_{MSY}$ ; SSB is above $B_{lim}$ but not yet at $MSYB_{trigger}$ . The stock is 'likely' be within biologically-based limits in that $B > B_{lim}$ , but not 'highly likely' ( $B < B_{trigger}$ , $F > F_{MSY}$ ). Considered further under scoring issue c.	Scored under scoring issue c																							
Edible crab Channel	(Note: see evaluation of stock structure in Section 2.4.2.6)	80 met																							

		<p>Edible crab N. Sea</p> <p>Minor retained species (Table 12)</p>	<p>CPUE in VIIe has been increasing gradually since mid-80s. On the basis, team considered that this stock is 'highly likely to be within biologically-based limits.</p> <p>S. North Sea: CEFAS evaluation (2011) suggests exploitation rates may be too high in UK coastal zone; EIFCA evaluation (2014) disagrees. Stock status unknown.</p> <p>Considered only against SG100. There is not a 'high degree of certainty' about the status of any of these stocks, nor are there target reference points defined for most of them. SG100 not met.</p>	<p><b>Scored under scoring issue c 80 met</b></p>
<b>b</b>	<b>Guide post</b>			Target reference points are defined for retained species.
	<b>Met?</b>			N (depends on species – see table below)
	<b>Justification</b>	Target ref points are not defined for all retained species; of the 'main' retained species, only plaice and cod have clearly defined TRPs.		
<b>c</b>	<b>Guide post</b>	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	<b>Met?</b>	Y	Y	
	<b>Justification</b>	<p>See scoring issue a) for evaluation of these stock to be scored here.</p> <p>Cod IVc+VIId: Since the start of cod recovery plan, F has decreased and SSB has increased dramatically. The latest ICES assessment (2015) estimates that F is below levels not seen since the 1960s, although it is still slightly higher than <math>F_{MSY}</math>; SSB is above <math>B_{lim}</math> but not yet at <math>MSYB_{trigger}</math>. The assessment team concluded on this basis that the cod recovery plan constitutes a strategy, which has been demonstrable effective in rebuilding the stock. SG80 is met.</p> <p>Edible crab (IVc): (Note: it is unclear whether this stock overlaps with this fishery at all – the team is evaluating it on a precautionary basis.) The team considered that it is extremely unlikely that this fishery will hinder recovery and rebuilding of the edible crab stock, given that landings of edible crab by this fishery are many times lower than the landings from targeted fisheries in the UK zone of the southern North Sea alone. The team considered that the low level of landings, gear that apparently does not target edible crab very efficiently, plus the MLS (which allows some spawning before it is reached according to CEFAS 2011) and the high discard survival (CEFAS 2011) therefore constitutes a 'partial strategy' of demonstrably effective measures.</p>		

<b>d</b>	<b>Guide post</b>	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	<b>Met?</b>	Y		
	<b>Justification</b>	Stock status is poorly known for edible crab in IVc and for several minor retained species. For crab there are specific measures and practices in place (low catches, MLS, high discard survival), which constitute a partial strategy for reducing the impact of this fishery on the stock to most likely a negligible level. More generally for minor retained species, there are measures for effort limitation in the fishery (limited licenses, as well as limited authorisations and limits on total gear length per vessel under the new French sole management plan), which should result in the fishery not causing these species to be outside biologically-based limits or hindering recovery. Met.		
<b>References</b>		Ifremer, 2012a, 2013, 2015 ICES, 2015e ICES, 2015f ICES, 2015i ICES, 2012c ICES, 2015g ICES, 2013b CEFAS, 2011 EIFCA, 2014 France, 2015. Arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêche de la sole commune ( <i>Solea solea</i> ) en Manche Est (division CIEM VII d)		
<b>OVERALL PERFORMANCE INDICATOR SCORE (based on calculation by scoring element, see table below):</b>				<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Calculation by scoring elements:**

Scoring element	Issue a	Issue b	Issue c	Issue d	Overall score for scoring element
Plaice (East channel)	100	100	80	60	100
Plaice (North Sea)	100	100	80	60	100
Dab	80	Not met	80	60	80
Catshark	80	Not met	80	60	80
Cod	N/A	100	80	60	100
Crab (Channel)	80	Not met	80	60	80
Crab (North Sea)	N/A	Not met	80	60	80
Minor retained	80	Not met	N/A	60	80

Evaluation table 14 - PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species				
Scoring Issue		SG 60	SG 80	SG 100		
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.		
	Met?	Y	Y	N		
	Justification	Rationale			Score	
		Plaice VIId	There is not a specific management plan for VIId plaice, but measures include TAC (for VII and e combined), as well as a MLS, a minimum mesh size (Reg. 850/98) and effort restrictions on the fishery (licences, authorisations and max. net length per vessel). The team considered that this constituted a <u>partial strategy</u> so 80 met.			80 met
		Plaice IV	There is an EU multiannual management plan for North Sea sole and plaice, including TACs and effort limitation. The team considered that this constituted a ‘strategy’ for the management of this stock.			100 met
Dab		There is no specific strategy for dab, but there is a precautionary TAC for IV (in combination with flounder), as well as mesh size and effort restrictions as above (but no MLS). Given that surveys suggest that this species is very abundant (the second most abundant in the North Sea after sandeel), with survey indices fluctuating without trend in recent years, the team considered that these measures were sufficient to constitute a ‘partial strategy’. SG80 is met.			80 met	
	Catshark (lesser spotted dogfish)	ICES advises that a TAC is <u>not</u> required at this stage, suggesting confidence in the current management measures, which makes sense given that survey indices are increasing. ICES note that should an increase in risk be detected advice will be given			80 met	

		<div><div>Cod</div><div>Edible crab</div><div>Minor retained species (Table 12)</div></div> <div><div>to implement alternative measures. The general measures in place for the fishery (mesh-size, effort limitations) therefore constitute an adequate 'partial strategy' for this species. 80 met</div><div>There is an agreed EU-Norway management strategy for North Sea and eastern Channel cod, which is now in its long-term phase according to ICES – i.e. recovery has finished and management following the MSY approach can start. SG100 is met.</div><div>The impact of this fishery on crab stocks is limited by various measures – MLS, high discard survival, the low efficiency of the gear for catching crabs and effort restrictions on the fishery. These factors mean that although it is unclear which stock the fishery is taking crab from (southern North Sea or W. Channel / Biscay) the impact of the fishery will be negligible in either case. The team concluded, therefore, that the measures in place constitute a sufficient partial strategy for edible crab. SG80 is met.</div><div>There is not a strategy in place for most of the minor retained species in relation to this fishery – 100 not met, default score of 80</div></div> <div><div></div><div>100 met</div><div>80 met</div><div>80 met</div></div>																	
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.															
	Met?	Y	Y	N															
	Justification	<table><thead><tr><th></th><th>Rationale</th><th>Score</th></tr></thead><tbody><tr><td>Plaice VIId</td><td>There is only a 'partial' strategy so the maximum score is 80. Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the partial strategy is working. 80 is met.</td><td>80 met</td></tr><tr><td>Plaice IV</td><td>Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the strategy is working. 100 is met.</td><td>100 met</td></tr><tr><td>Dab</td><td>There is only a 'partial' strategy so the maximum score is 80. Survey indices have been high and stable in recent years, giving an objective basis for confidence that the partial strategy is working. 80 is met.</td><td>80 met</td></tr><tr><td>Catshark</td><td>There is only a 'partial' strategy so the maximum score is 80. Abundance indices have</td><td>80 met</td></tr></tbody></table>				Rationale	Score	Plaice VIId	There is only a 'partial' strategy so the maximum score is 80. Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the partial strategy is working. 80 is met.	80 met	Plaice IV	Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the strategy is working. 100 is met.	100 met	Dab	There is only a 'partial' strategy so the maximum score is 80. Survey indices have been high and stable in recent years, giving an objective basis for confidence that the partial strategy is working. 80 is met.	80 met	Catshark	There is only a 'partial' strategy so the maximum score is 80. Abundance indices have	80 met
		Rationale	Score																
Plaice VIId	There is only a 'partial' strategy so the maximum score is 80. Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the partial strategy is working. 80 is met.	80 met																	
Plaice IV	Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the strategy is working. 100 is met.	100 met																	
Dab	There is only a 'partial' strategy so the maximum score is 80. Survey indices have been high and stable in recent years, giving an objective basis for confidence that the partial strategy is working. 80 is met.	80 met																	
Catshark	There is only a 'partial' strategy so the maximum score is 80. Abundance indices have	80 met																	

		(lesser spotted dogfish) Cod	increased dramatically in recent years, giving an objective basis for confidence that the partial strategy is working. 80 is met. Trends in fishing mortality and SSB as evaluated by ICES support high confidence that the strategy is working. ICES consider that the recovery and rebuilding phase is over. 100 is met.	100 met		
		Edible crab	There is only a 'partial' strategy so the maximum score is 80. Given that the landings (and catch) of crab in this fishery are very low compared to those from targeted fisheries on the stocks, the team considered that there is an objective basis for confidence that the partial strategy for this fishery will ensure that it does not impact these stocks. 80 is met.	80 met		
		Minor retained species (Table 12)	(scoring against SG100 only) There is no strategy in place for most of the minor retained species in relation to this fishery so 100 is not met. Default score of 80	80 met		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.		
	Met?		Y	N		
	Justification	Rationale			Score	
		Plaice VIId	Although it is difficult to evaluate, there is some evidence that the EU has set the TAC higher than ICES advice under the MSY framework. Nevertheless, it is clear that the stock has rebounded very significantly in recent years, with $F \ll F_{MSY}$ and $SSB \gg MSYB_{trigger}$ . On this basis, the team considered that from the point of view of the stock, the partial strategy has been implemented successfully. 80 is met.			80 met
		Plaice IV	The TAC has been set according to ICES advice (following the management plan) since 2012. F has declined to $\sim F_{MSY}$ , $SSB \gg MSYB_{trigger}$ . There is therefore clear evidence that the strategy is being implemented successfully; SG100 is met.			100 met
		Dab	It is difficult to evaluate how the TAC is set because it is a joint precautionary TAC with flounder, however, landings are considerably below the maximum level advised by ICES, taking discards into account. Survey indices are high and fluctuating without trend. The team considered that this constitutes evidence that the partial strategy is being implemented successfully. 80 is met.			80 met
	Catshark (lesser spotted	ICES does not consider that a TAC is necessary at present; survey indices are increasing, suggesting that fishing pressure is not significantly constraining the stock			80 met	

		dogfish)	dynamics. On this basis, the team considered that from the stock point of view, the partial strategy is successful. 80 is met.	
		Cod	Fishing mortality on this stock has been systematically reduced over several years following the requirements of the cod recovery plan (days at sea limits, restrictive TACs, juvenile and real-time closed areas etc.). The trends in F and SSB as evaluated by ICES show that this strategy has been successful, and the stock is now in the long-term rather than rebuilding phase of the management plan. 100 is met.	<b>100 met</b>
		Edible crab	The 'partial strategy' for this fishery is based on the nature of the gear and effort restrictions in the fishery. Effort restrictions are enforced by the French state (see PI3.2.3 below) and there is no evidence of IUU in this fishery. Landings are monitored via logbooks and via the ObsMer observer programme, which also monitors discards. The team considered that SG80 is met.	<b>80 met</b>
		Minor retained species (Table 12)	(scoring against SG100 only) There is no strategy in place for most of the minor retained species in relation to this fishery so 100 cannot be met. Default score of 80	<b>80 met</b>
<b>d</b>	<b>Guidepost</b>			There is some evidence that the strategy is achieving its overall objective.
	<b>Met?</b>			N
	<b>Justification</b>	This SG is met for North Sea plaice and cod, the only retained species for which there is a strategy. Not met for the other stocks.		
<b>e</b>	<b>Guidepost</b>	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Some sharks are retained (main: small-spotted catshark, minor: starry smooth-hound – see Table 12). These species are not the shark species susceptible to finning, which mainly concerns larger pelagic sharks. Shark finning is banned in the EU (Regulation 605/2013), and there is no evidence that shark finning takes place or has ever taken place in this fishery. The team considered that SG100 is met.		
<b>References</b>		ICES, 2015e; ICES, 2015f; ICES, 2015i ; ICES, 2012c ; ICES, 2015g ; ICES, 2014k ICES, 2013b CEFAS, 2011 EIFCA, 2014		

	Main species concerned by shark finning: <a href="http://www.sharksavers.org/en/education/sharks-are-in-trouble/the-impact-of-the-shark-fin-trade/">http://www.sharksavers.org/en/education/sharks-are-in-trouble/the-impact-of-the-shark-fin-trade/</a> CFP Regulation No 605/2013
<b>OVERALL PERFORMANCE INDICATOR SCORE (based on calculation by scoring element, see table below):</b>	<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/A</b>

#### Calculation by scoring elements:

Scoring element	Issue a	Issue b	Issue c	Issue d	Issue e	Overall score for scoring element
Plaice (East channel)	80	80	80	not met	N/A	80
Plaice (North Sea)	100	100	100	100	N/A	100
Dab	80	80	80	not met	N/A	80
Catshark	80	80	80	not met	100	85
Cod	100	100	100	100	N/A	100
Crab (Channel)	80	80	80	not met	N/A	80
Crab (North Sea)	80	80	80	not met	N/A	80
Minor retained	80	80	80	not met	met for one relevant species	80

Evaluation table 15 - PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species													
Scoring Issue		SG 60	SG 80	SG 100											
a	Guidepost	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.											
	Met?	Y	Y	N											
	Justification	Logbook and observer data are available, providing qualitative and quantitative information for all species, both landed (fully quantitative) and discarded (estimated from a sub-sample). On this basis, SG80 is met for all retained species. In relation to SG100, accurate and verifiable information is available on landings from DPMA (although it proved difficult to obtain fully corrected and verified data for this assessment). In relation to discards, observer data provide estimates, but since observer coverage is quite low in terms of percentage (<1%), because of the high number of small vessels involved in this fishery, although it does include quite a large number of vessels and trips (see Table 11), then it is most likely untrue to describe these data as ‘accurate and verifiable’. In addition, the consequence for the status of affected populations may not be evaluated; for example, for some of the minor retained species. SG100 is not met.													
b	Guidepost	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.											
	Met?	Y	Y	N											
	Justification	<table><tr><th colspan="2">Rationale</th><th>Score</th></tr><tr><td>Plaice VIId</td><td>Analytical stock assessment evaluates stock status and exploitation rate against MSY reference points including an assessment of uncertainty. <math>F &lt; F_{MSY}</math> and <math>SSB &gt; MSYB_{trigger}</math> with a high degree of certainty as measured by 5% and 95% confidence intervals. 100 is met.</td><td>100</td></tr><tr><td>Plaice IV</td><td>As above</td><td>100</td></tr><tr><td>dab</td><td>Relative stock status can be estimated from survey trends; ICES provides advice on maximum landings based on the precautionary approach, which can be considered to constitute ‘biologically-based limits’. SG80 is met, but since the assessment is relative</td><td>80</td></tr></table>			Rationale		Score	Plaice VIId	Analytical stock assessment evaluates stock status and exploitation rate against MSY reference points including an assessment of uncertainty. $F < F_{MSY}$ and $SSB > MSYB_{trigger}$ with a high degree of certainty as measured by 5% and 95% confidence intervals. 100 is met.	100	Plaice IV	As above	100	dab	Relative stock status can be estimated from survey trends; ICES provides advice on maximum landings based on the precautionary approach, which can be considered to constitute ‘biologically-based limits’. SG80 is met, but since the assessment is relative
Rationale		Score													
Plaice VIId	Analytical stock assessment evaluates stock status and exploitation rate against MSY reference points including an assessment of uncertainty. $F < F_{MSY}$ and $SSB > MSYB_{trigger}$ with a high degree of certainty as measured by 5% and 95% confidence intervals. 100 is met.	100													
Plaice IV	As above	100													
dab	Relative stock status can be estimated from survey trends; ICES provides advice on maximum landings based on the precautionary approach, which can be considered to constitute ‘biologically-based limits’. SG80 is met, but since the assessment is relative	80													

		<p>Catshark (lesser spotted dogfish) cod</p> <p>Edible crab</p> <p>Minor retained species (Table 12)</p>	<p>and there is no high degree of certainty, SG100 is not met.</p> <p>ICES estimate a relative abundance index, on the basis of which they advise that a TAC is not required. On this basis, as for dab above SG80 is met but SG100 is not met.</p> <p>Analytical stock assessment evaluates stock status and exploitation rate against reference points; including an assessment of uncertainty and providing 5% and 95% confidence intervals. As for plaice above, SG100 is met.</p> <p>Stock status is evaluated semi-quantitatively (based on trends in standardised CPUE) for the western Channel stock; for the North Sea stock various attempts have been made based on the UK fishery, but the outcome remains unclear. Based on this fishery specifically, however, information on landings from this fishery as well as discards from this fishery, discard survival and landings from other fishery is sufficient to estimate with reasonable confidence that this fishery does not have an impact on the outcome status of these crab stocks. On this basis, the team considered that SG80 is met, but SG100 is not met.</p> <p>(scoring against SG100 only)</p> <p>Outcome status cannot be estimated with a high degree of certainty for many (most) of these species – SG100 is not met</p>	<p><b>80</b></p> <p><b>100</b></p> <p><b>80</b></p> <p><b>Default 80</b></p>
<b>c</b>	<b>Guidepost</b>	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	All the main species are considered to have either a strategy or a partial strategy in place (see rationales for PI 2.1.2), so SG80 is met. In relation to SG100, only North Sea cod and plaice are considered to have a strategy in place, but as set out in scoring issue b) above, the information is available to evaluate outcome status on an on-going basis (and hence the success of the strategy) with a high degree of certainty, hence SG100 is met for these species. Information would also most likely to be sufficient to put in place a strategy (e.g. a management plan) for eastern Channel plaice, if desired, so SG100 is also met for this stock. For the other species, stock status is evaluated only on a relative basis, so elements of a strategy (such as MSY-based reference points) would not be easy to define. SG100 is not therefore met for any of the other retained species.		

<b>d</b>	<b>Guidepost</b>		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess on-going mortalities to all retained species.
	<b>Met?</b>		Y	N
	<b>Justification</b>	Logbook and observer data are collected sufficient to detect changes in the operation of the fishery. In relation to changes in the outcome indicator score (due to change in the effectiveness of the strategy or for other reasons), all the 'main' retained species are evaluated either quantitatively or qualitatively (see information provided in 2.1.1 and in scoring issue b) above), hence changes in stock status would be detected either via an ICES stock assessment or via changes in survey trends (dab, catshark) or via changes in CPUE for various targeted fisheries (crab). SG80 is therefore met. In relation to SG100, while it is possible to evaluate landings and estimate discards for all retained species, an assessment of 'mortalities' also requires some information about the absolute stock biomass (in order to evaluate catch as a proportion of the overall stock). This is not possible for the minor retained species, or the main except for plaice and cod.		
<b>References</b>		Ifremer 2012a, 2013, 2015 ICES, 2015e ICES, 2015f ICES, 2015g ICES, 2015i ICES, 2012c ICES, 2013b CEFAS, 2011 EIFCA, 2014 ICES NSSK report 2015		
<b>OVERALL PERFORMANCE INDICATOR SCORE (based on calculation by scoring element, see table below):</b>				<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Calculation by scoring elements:**

Scoring element	Issue a	Issue b	Issue c	Issue d	Overall score for scoring element
Plaice (East channel)	80	100	100	100	95
Plaice (North Sea)	80	100	100	100	95
Dab	80	80	80	80	80
Catshark	80	80	80	80	80
Cod	80	100	100	100	95
Crab (Channel)	80	80	80	80	80
Crab (North Sea)	80	80	80	80	80
Minor retained	100 not met	100 not met	100 not met	100 not met	80

Evaluation table 16 - PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	Based on an analysis of ObsMer observer data for this fishery (Table 12), no 'main' bycatch species were identified. SG80 is therefore met by default. Only one species was identified that is 100% discarded, which is the undulate ray – a species which in 2014 was not allowed to be landed in Subarea VII – in 2015 there is provision for a small bycatch quota. ICES provide a qualitative assessment only, and advise no targeted fisheries on the basis of precautionary considerations. SG100 is therefore not met.		
b	Guide post	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	80 met by default		
c	Guide post	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	Met by default		

<b>References</b>	Ifremer, 2012b, 2013, 2015 EU fishing opportunities 2015 correction ((EU) 2015/523) ICES (2014j)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

Evaluation table 17 - PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	80 met by default. For SG100, there are elements of a strategy for minimising bycatch, such as the net mesh-size limits set out in EU Regulation 850/98, but clearly it has only limited success, since discards are significant (e.g. for some main retained species such as plaice and dab, a considerable proportion of the total catch is discarded – plaice ~40%, dab up to 90%). The landings obligation, which is theoretically due to be implemented in this fishery in 2016, would provide a ‘strategy’ for minimising discards, but it is not yet clear when and how it will be implemented in practice in this fishery. The Advisory Councils have proposed phasing it in, but this remains to be agreed at EU level. For the present, therefore, the team did not consider that there is a strategy in place in relation to discards, and SG100 is not met.		
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	80 met by default. Since there is not (at present) a strategy, SG100 cannot be met.		

<b>c</b>	<b>Guide post</b>		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	<b>Met?</b>		Y	N
	<b>Justification</b>	80 met by default. SG100 not met because no strategy.		
<b>d</b>	<b>Guide post</b>			There is some evidence that the strategy is achieving its overall objective.
	<b>Met?</b>			N
	<b>Justification</b>	No strategy – not met.		
<b>References</b>		Landings obligation info – see main report for references EU Regulation 850/98		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Evaluation table 18 - PI 2.2.3**

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Guide post</b>	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	No 'main' bycatch species have been identified, so 80 is met by default. In relation to SG100, information on discards is available via observer reports, but the % coverage is low (<1%) so to evaluate total bycatch quite considerable extrapolation is required, hence 'accurate' is most likely not met. In addition, for the only species identified which was not retained (undulate ray – for regulatory reasons until 2015), the consequence of bycatch for the status of the population cannot be quantitatively assessed. SG100 is therefore not met.		
<b>b</b>	<b>Guide post</b>	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	80 met by default. SG100 is not met for the reasons set out above.		
<b>c</b>	<b>Guide post</b>	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	80 met by default. For SG100, the landings obligation will most likely constitute a strategy when it is introduced, but it is not so far clear how or when this will occur. SG100 is therefore not met.		

<b>d</b>	<b>Guide post</b>		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	<b>Met?</b>		Y	N
	<b>Justification</b>	80 met by default. SG100 is not met for the reasons set out above, although there is some monitoring via the ObsMer programme.		
<b>References</b>		ICES, 2014j Ifremer, 2012b, 2013 and 2015, Observer reports		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 19 - PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	<p>Based on the analysis of observer reports, the team identified the following ETP species as potentially interacting with the fishery: harbour porpoise, Allis shad and Twaite shad.</p> <p><u>Porpoise</u>: An analysis of 85 observer reports from 2013 and 2014 recorded one interaction with a harbour porpoise, which had become entangled in a buoy line and was killed. It is likely that the total mortality from this fishery is higher than one in two years, since % observer coverage is low, but it is not reasonable to try and scale up to get a total mortality estimate from this fishery specifically. In terms of the whole North Sea population (including IIIa and VIId), ICES WGBYC have tried to estimate total harbour porpoise mortality from gillnets (the main gear which poses a risk to the population). They give an estimate range of 1235-1990 individuals caught, out of a total estimated population of 274,000, giving an annual bycatch per cent from netting of 0.45-0.73% of the population. ASCOBANS has set a conservation objective for harbour porpoises of less than 1.7% of additional mortality, beyond which they estimate population-level impacts – in the worst case scenario (upper CI) this métier in total across IIIa, IV and VIId accounts for just less than half of this bycatch rate. On this basis, the team considered that SG80 is met for harbour porpoise, but that SG100 is not met because observer coverage (in this and other gillnet fisheries) is not sufficient for a 'high degree of certainty' in mortality estimates.</p> <p><u>Allis shad</u>: Although the Allis shad is protected under French law, it is assessed as 'least concern' by IUCN. They note that although there were large population declines in the first half of the 20<sup>th</sup> century, the population appears to have stabilised. This fishery operates at the edge of the range of Allis shad, which is primarily a species of the west coast of France. The main conservation concerns for this species relate to changes in its riverine habitats (dams which block migration pathways, pollution, canalisation), and fisheries bycatch, particularly in this area, is not likely to be a significant impact factor. SG80 is met. Since the team was not able to source detailed information about Allis shad populations in France, they are not able to conclude that SG100 is met.</p> <p><u>Twaite shad</u>: The situation is similar to that for Allis shad, except that Twaite shad is a more northerly species, being more abundant in catchments around the North Sea and Baltic, and hence perhaps being more likely to have an overlap with this fishery. Like the</p>		

		Allis shad, it is assessed as 'least concern' by IUCN, who note that it is ' <i>quite common</i> ' around the North Sea and the French Atlantic coast, and that populations are increasing in the Baltic. As for Allis shad, the team concluded that SG80 but not SG100 was met.		
b	Guidepost	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	<p><u>Harbour porpoise</u>: Based on the evaluation above, the team concluded that direct effects (mortality from entanglement) are highly unlikely to create unacceptable impacts to harbour porpoise, particularly since it is reported that harbour porpoise populations have increased in the eastern Channel in recent years. Based on the limited observer coverage and the failure of France to report formally to WGBYC since 2013, however, it is not possible to argue that there is a 'high degree of confidence' of no significant detrimental impacts.</p> <p><u>Shad</u>: Based on the evaluation above, and particularly given that IUCN assess these species as 'least concern' and in the case of Twaite shad 'quite common', the team concluded that SG80 was met. The team did not, however, locate any data suggesting that SG100 could be met.</p>		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	<p><u>Harbour porpoise</u>: Indirect impacts from this fishery might be impacts such as noise and disturbance – however, EU Regulation 812/2004 requires the use of pingers on nets in VIId, pre-supposing that scientists are not concerned about noise impacts per se. (See further discussion of pingers below.) In addition, the eastern Channel is an extremely busy shipping lane, and small-scale fishing vessels such as those in this UoC are not likely to account for the majority of disturbance. The reported increase in harbour porpoise in this area in recent years suggests that vessel disturbance is not a significant issue. SG80 is met, but SG100 is not met since data remain limited. (Note that the fishermen report that the pingers may attract seals that may have learned to associate the noise with nets and hence food – this is anecdotal, however.)</p> <p><u>Shad</u>: The key conservation impacts for shad relate to loss of riverine habitat. The team were unable to think of any possible indirect effects of the fishery on shad, and in that sense had a high degree of confidence that there were none – however, it is not clear that the ecology of shad in the marine environment is sufficiently well known to say this for certain. SG80 is met but SG100 is not met.</p>		
References		ICES, 2014g Freyhof, 2008a		

	Freyhof, 2008b Ifremer 2012b	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

Evaluation table 20 - PI 2.3.2

PI 2.3.2		<b>The fishery has in place precautionary management strategies designed to:</b> <ul style="list-style-type: none"> <li>• Meet national and international requirements;</li> <li>• Ensure the fishery does not pose a risk of serious harm to ETP species;</li> <li>• Ensure the fishery does not hinder recovery of ETP species; and</li> <li>• Minimise mortality of ETP species.</li> </ul>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Guide post</b>	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p><u>Porpoise</u>: EC regulation 812/2004 sets out monitoring requirements for fisheries interactions with cetaceans, as well as requirement for pingers on set nets in VIId (although not IVc). This requirement was put in place because Subarea VII in general was identified as a significant area for fishery/cetacean interactions, but it appears that this does not take account of considerable variability within VII – Ifremer note that the eastern Channel and the Breton coast have low rates of interaction, although harbour porpoise are present in these areas in increasing numbers (Ifremer 2012). This fishery has never complied with the requirement for pingers, on the basis that it is difficult and expensive for fishermen without having any demonstrable effect (rates of cetacean interaction being low – and the only interaction observed in 2013 and 2014 was in fact in Subarea IV), as well as concerns that they may attract seals. A derogation request is in progress.</p> <p>Peer reviewer 1 noted that the use of pingers, although apparently not useful, nevertheless forms part of the formal international requirements on this fishery. The team considered this point, and concluded that since i) France has presented data to demonstrate a low level of interactions in VIId (none so far observed), as well as a trial of pingers which had negative rather than positive results; ii) the Commission has declined to enforce the regulation in this fishery and iii) the regulation is currently under review and revision as part of the review of technical measures; then the de facto situation is that this requirement no longer applies in this fishery. The full argument is given in the response to Peer Reviewer 1.</p> <p><u>Shad</u>: Although protected, it appears that shad populations are relatively healthy, at least in France, and measures to protect them in any case focus more on the freshwater part of their life cycle, where are there main threats.</p> <p>More generally for all the species concerned, Natura 2000 provides a framework for the assessment and management of interactions</p>		

		<p>with ETP species. A variety of areas have been designated as SACs in the area of the fishery, with porpoises part of the designation for all of them and shad for a couple of the estuarine ones. There are not yet, however, any SAC-specific management measures in place, because risk assessments are still being conducted by the Comités Régionaux de Pêche. The first one to be completed in draft form, for the Banc des Flandres, reportedly highlights interactions with a shrimp trawl fishery, but not this fishery (A. Viera, CRPM-Nord-Pas de Calais, pers. comm.) and management measures are being negotiated on that basis.</p> <p>Overall, the team considered that the Natura 2000 process, which is underway, constitutes a 'strategy' for managing impacts on ETP species, with the fact that risk assessments are not yet completed balanced by the lack of evidence of any significant impacts (see rationale for 2.3.1 above). On this basis, the team considered that SG80 is met. Since the process of risk-assessment is not complete, however, it cannot yet be considered a 'comprehensive strategy', as required for SG100.</p>		
<b>b</b>	<b>Guide post</b>	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p><u>Porpoise</u>: The FilManCet study provides objective information on interactions between cetaceans and this fishery, suggesting i) that they are low and ii) that pingers are unlikely to make any difference. The risk assessments and management measures being put in place for the Natura 2000 sites at present will be based, among other things, on the outcome of this study. On this basis, SG80 is met. The team considered that the first part of SG100 is met, however, since it is difficult to scale up observations of interactions to gain an overall estimate for the whole fishery (interactions being rare and observer coverage rates low), then the second part of SG100 ('a quantitative analysis') is not met.</p> <p><u>Shad</u>: Like porpoises, interactions with shad are rare but cannot be fully quantified. As noted above, measures to protect shad populations are focused on freshwater ecosystems, where the main threats are. IUCN consider that these populations are 'least concern', with Allis shad populations reported as 'stable' and Twaite shad 'quite common'. The team considered that this provides an objective basis for confidence that the strategy will work, and includes information about the fishery (observer reports) and the species (distribution, population trends and freshwater management measures), hence SG80 is met. As for porpoise, SG100 is not fully met.</p>		
<b>c</b>	<b>Guide post</b>		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	<b>Met?</b>		Y	N
	<b>Justification</b>	Observer reports show that interactions are rare. SG80 is met. However, since coverage rates are relatively low, SG100 is not met.		

<b>d</b>	<b>Guide post</b>			There is evidence that the strategy is achieving its objective.
	<b>Met?</b>			N
	<b>Justification</b>	There are no objectives specific to harbour porpoise or shad that we are aware of, therefore this is not met.		
<b>References</b>				
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 21 - PI 2.3.3

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> <li>Information for the development of the management strategy;</li> <li>Information to assess the effectiveness of the management strategy; and</li> <li>Information to determine the outcome status of ETP species.</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate <u>outcome status of ETP species</u> with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Observer data exists from 287 trips in total from 2012-2014. This allows a relatively good quantitative analysis of discards, for example, but only an order of magnitude estimate of interactions with ETP species because these interactions are rare. Nevertheless, the team considered that sufficient information is available to allow the impact of fishing to be quantified to a sufficient level for management for ETP species, hence SG80 is met (noting, for example, that Ifremer provided information to WGBYC from the FilManCet project which allowed WGBYC to estimate overall fisheries-related mortality of harbour porpoise in the North Sea and eastern Channel; a similar exercise could presumably be carried out for shad if it were relevant to do so). Nevertheless, there is not a 'high degree of certainty' in any of these estimates, so SG100 is not met.		
b	Guide post	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of <u>all</u> impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	For North Sea and Eastern Channel porpoise, fisheries impacts, including from this fishery, have been estimated by WGBYC who concluded that they were inside ASCOBAN limits; hence SG80 is met. For shad, IUCN have evaluated the population status as 'least concern' based on population trends mainly from freshwater areas, hence here also SG80 is met. SG100 is not met for this or many other fisheries; this would require a higher rate of observer coverage.		

<b>c</b>	<b>Guide post</b>	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	As set out above, information is sufficient to measure trends in a semi-quantitative (or sufficiently quantitative) way, and is being used at present to develop risk assessments and management plans or measures for each of the Natura 2000 areas, which have been designated partially because of the presence of these species. Hence SG80 is met. Information does not, however, reach the bar of a 'high degree of certainty', so SG100 is not met.		
<b>References</b>		Ifremer 2012b, 2013, 2015, ICES, 2015h, ASCOBANS, 2014		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 22 - PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	<p>A detailed argument as to which habitat impacts are likely to be relevant is set out in the main report, Section 2.4.5. Sole occur mainly on sand habitats, and the impacts of the gear are likely to most significant on emergent epifauna (corals, sponges etc.), which are not present in any numbers in sand habitats. The fishing area overlaps with one OSPAR vulnerable habitat – maerl beds in the Ridens de Boulogne – but these are part of a rocky reef complex unsuitable for sole fishing. Impacts of bottom-set nets on sandy habitats are mainly restricted to issues around gear loss. All gear is marked according to Arrêté n° 2883 P-5 du 1er Août 1969 and voluntary measures including flags and luminous markings; FROM Nord report that gear is still lost (mainly due to interactions with other ships) but is nearly always retrieved.</p> <p>On this basis, the team considered that it is at least 'highly unlikely' (&lt;30% probability) that the fishery does serious or irreversible harm to habitat structure and function in the areas where it operates. There is, however, no direct evidence in the form of before/after studies or open/close area comparisons as to the long-term impacts on, for example, benthic invertebrates. Therefore, SG80 is met but SG100 is not met.</p>		
References		Arrêté n° 2883 P-5 du 1er Août 1969 see main report Section 3.4.6		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 23 - PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N
	Justification	There is a framework for habitat protection in the area of the fishery in the form of a network for Natura 2000 sites and the Marine Park, protecting habitats including subtidal sand flats, subtidal reefs, maerl beds and estuaries (see Section 2.4.5 of the main report.) Management measures for these areas are not yet in place, awaiting completion of a risk assessment process that has so far only been completed for the Banc des Flandres area. However, given that there is no evidence for substantive habitat impacts from this fishery, the team concluded that this nevertheless constitutes a sufficient partial strategy to achieve outcome performance level 80.		
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N
	Justification	Given that the fishery only takes place in areas of habitat which are not vulnerable to disturbance by this gear (because sole only occur in commercially relevant densities in sandy areas) then the team considered that there is a priori an objective basis for confidence that the partial strategy will work, based on information about the target species and habitats involved. SG80 is met. There has not been, however, any direct testing of habitat impacts, as noted above. SG100 is not met.		
c	Guide post		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N

	<b>Justification</b>	As noted above, basic logic suggests that there is not likely to be an overlap between the fishery and habitats, which are vulnerable to the gear. In relation to the habitat protection strategy (Natura 2000), the strategy is in the process of being implemented – i.e. risk assessments are underway, and management measures developed according to the outcome (Antony Viera, CRPM Nord-Pas de Calais, pers. comm.). SG80 is met. In relation to SG100, more direct evidence would be required such as VMS tracks – these will become available since VMS is now a requirement under the arrêté of 22 January 2015 (French E. Channel sole management plan) but were not available at the time of writing.		
<b>d</b>	<b>Guide post</b>			There is some evidence that the strategy is achieving its objective.
	<b>Met?</b>			N
	<b>Justification</b>	In the absence of a full strategy, this scoring issue is not met.		
<b>References</b>		Arrêté of 22 January 2015 (French E. Channel sole management plan); see Section 2.4.5		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 24 - PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	Habitat maps are available for the area (see <a href="http://www.emodnet-seabedhabitats.eu/">http://www.emodnet-seabedhabitats.eu/</a> ) as are maps for OSPAR habitats (available from the same website). Likewise, the data sheets for each of the SACs list the habitats present, including not only Natura 2000 habitats but also other habitats of conservation interest (see Figure 26, Table 18), and survey information is also available (Table 17). On this basis, the team considered that SG80 is met. In relation to SG100, the team noted that vulnerable habitats (as designated by OSPAR) are mapped across the north-east Atlantic, although with better detail in some areas than others. Overall, the team considered that this information was sufficient to evaluate the likely impact of the fishery in this area on vulnerable habitats over a wider area (if, for example, a high proportion of this habitat occurred in the area of the fishery), which is presumably the intent. SG100 is therefore met.		
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	The nature of the impacts of the fishery on habitats types is identified (see main report Section 3.4.6). Now that VMS is a requirement for this fishery regardless of the size of vessel (following the implementation of the French management plan for eastern Channel sole in 2015) then there is also reliable information on the timing and location of use of fishing gear, and this could be cross-referenced to the habitat mapping information given above to evaluate the spatial extent of interaction of the gear with all habitats – although please note that the team has not done this because VMS data is not yet available. Nevertheless, and taking into account the likely low impact of this fishery on sensitive habitats, the team considered that SG80 is met. SG100 is not met for this gear type, as far as the team is aware.		

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
c	Guide post		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	VMS data continues to be collected to evaluate the spatial distribution of effort. Natura 2000 areas must be periodically evaluated to ensure good conservation status – these cover the vulnerable habitats identified by OSPAR. On this basis, the team considered that SG80 is met. It is not clear, however, that full habitat surveys over the whole area are conducted on any ongoing basis, so SG100 is most likely not met.		
References		EUNIS, Ifremer, MNHN, AAMP websites, OSPAR website, Arrêté of 22 January 2015 (French E. Channel sole management plan); see Section 2.4.5		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

Evaluation table 25 - PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	P
	Justification	<p>Section 1.1.7 of the main report identifies two potential ecosystem impacts of this fishery: removal of the target species (and other ecologically similar bycatch species such as plaice) and impacts of discarding. Ecologically speaking, sole is not likely to structure ecosystems whether as predator, competitor or prey, since they feed on a wide range of benthic invertebrate species (crustaceans and polychaetes mainly) and are preyed on by a wide range of predators (mainly on the nursery grounds). They are likely to compete, to some extent, with other ecologically similar species such as plaice, but in fact plaice are somewhat more likely than sole to play an ecosystem role, if only because they are ~10 times more numerous, according to ICES estimates for the eastern Channel. However, all four of these stocks (E Channel sole and plaice, North Sea sole and plaice) are in good condition according to the most recent ICES estimates; stocks of other bycatch species (dab, catshark, crab) are also apparently healthy, and even cod is recovering. It is also noteworthy that catches by this fishery on all these stocks (except eastern Channel sole and plaice) are a low proportion of the total catch on the stocks, including discards (North Sea sole, plaice and dab mainly being exploited by beam trawls, cod and catshark by otter trawls and crab by targeted pot fisheries).</p> <p>Discarding can cause ecological changes, mainly by providing a food supplement for scavenging invertebrates, fish, birds and mammals (also by causing organic pollution but this is not considered likely in this high energy environment). This fishery is estimated to discard ~300-350 t a year (see Section 2.4.3 of the main report), which is significant –but low compared to discards by beam trawls in the same area (~10 times higher). The landings obligation will, presumably, reduce or eliminate this discarding, although the details of its implementation remain to be decided (and it may not have a beneficial impact on the ecosystem in any case – see Heath et al., 2014).</p> <p>The team concluded that the fishery is at least 'highly unlikely' (&lt;30% probability) to disrupt ecosystem structure and function to the point of serious or irreversible harm (SG80 is met).</p> <p>Although there is not a specific ecosystem analysis for this particular fishery, there exist ecosystem models applicable to the North Sea and English Channel which consider the role of different species, including flatfish, and the impact of demersal fishing. The team concluded that this constituted partial evidence, hence SG100 is partly but not fully met, giving a score of 90.</p>		

<b>References</b>	ICES, 2015f; ICES, 2015a; ICES, 2015b; ICES, 2015f; ICES, 2015i; ICES, 2015g CEFAS, 2011 Ifremer, 2012b, 2013, 2015 Heath et al., 2014 Ajaulo et al., 2008 Mackinson and Daskalov, 2008
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/A</b>

**Evaluation table 26 - PI 2.5.2**

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	<p>There are management measures in place for this fishery for the target species (see PI 1.2.2) and for the main retained species (see PI2.1.2). The landings obligation, when it comes in, will provide a framework for the reduction/elimination of discards. ETP species and habitats come under the Natura 2000 framework, which is being well implemented, on the French side of the eastern Channel (although less so on the UK side).</p> <p>A more general framework is provided by the Marine Strategy Framework Directive (MSFD) (2008/56/CE). Under the MSFD, each member state should achieve 'good ecological status' by 2020 and establish an action plan on how this will be achieved. For the implementation of the MSFD, four sub-regions have been defined within French waters, including the sub-region of the Channel/North Sea. The action plan for the sub-region includes an initial diagnostics and data gap analysis of the status of the marine environment, a definition of what 'good ecological status' is within the context of the sub-region, environmental objectives and management measures to reach that status (to be established by 2015 and implemented in 2016). The monitoring programme to see how the objectives are being reached has been finalised (DIRM-MEMN,2015). The initial diagnostic for the sub-region provides in-depth analysis on the ecological characteristics and status of the marine environment within the sub-region and the anthropogenic influences acting on this environment (DIRM-MEMN, 2012). Following the issuing of this report a number of objectives were identified in 2012. These objectives are very generic however, and more specific ones are due to be identified during 2015. Similarly, work also continues on the management plan. Although the activities under the MSFD are work in progress, the management measures already in place (e.g. North Sea sole and plaice management plan, French eastern Channel sole management plan, cod recovery plan, CFP MSY framework, landings obligation, Natura 2000) ensure that the fishery does not pose a risk to the wider ecosystem (as described above). The team therefore felt that overall, at least a partial strategy is in place and that SG80 is met. However, there is for the moment no 'sole fishery ecosystem management plan', although there are various plans dealing with various elements, as set out above. Therefore SG100 is not fully met.</p>		

<b>b</b>	<b>Guide post</b>	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The elements of the partial strategy relating to individual stocks (e.g. North Sea sole and plaice management plan, French eastern Channel sole management plan, cod recovery plan, TACs or other management measures for individual species) take into account available information via ICES assessments. ICES also provides mixed species advice, and has a working group on multispecies assessment methods, which aims to deal with fisheries management at a more 'ecosystem' level (i.e. by considering species in the context of mixed fisheries).</p> <p>In relation to the partial strategy for ETP species and habitats (i.e. Natura 2000), risk assessments are underway at present, and these are using all the information available to analyse potential impacts and develop management measures (A. Viera, pers. comm.). The ObsMer observer programme feeds data to, for example, ICES WGBYC and ASCOBANS, via the FilManCet project, allowing evaluation of stock status of species such as harbour porpoise.</p> <p>Overall, given that there is a considerable amount of work ongoing in this area at present, and given that the outcome 80 level is met, the team considered that SG80 is met. Since there is no formal 'plan', SG100 is not met.</p>		

c	<b>Guide post</b>	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The team considered that the partial strategy is likely to work, based on the following arguments:</p> <ul style="list-style-type: none"> <li>• The fisheries management framework requires stocks to be maintained at levels of high productivity (MSY)</li> <li>• Status of the target stock and all stocks of 'main' retained species is good or stable, except cod, which is recovering</li> <li>• A management plan limits effort and protects some nursery grounds in the eastern Channel</li> <li>• Although there is some discarding, it is not significant compared to mobile gear fisheries in this area</li> <li>• There is no evidence of significant impacts on ETP species (porpoise, shad)</li> <li>• The fishing gear is not high impact, and the fishery takes place in habitats which are robust to the impacts of the gear</li> <li>• There is a framework for the protection of representative and vulnerable habitats and ETP species via Natura 2000, with risks and management measures currently being worked out</li> <li>• There is no evidence that the target or main retained species are significant in structuring the ecosystem, either as predators, prey or competitors</li> <li>• The programme of measures for the MSFD – to reach or maintain 'good ecological status' is currently being finalised</li> </ul> <p>Hence SG80 is met. Since the above can be considered 'plausible argument' rather than 'prior experience' or 'information directly from the ecosystem involved' then SG100 is not met.</p>		
d	<b>Guide post</b>		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	<b>Met?</b>		Y	N
	<b>Justification</b>	<ul style="list-style-type: none"> <li>• ICES advice follows the MSY framework or a management plan which has been evaluated against the precautionary principle, or the agreed precautionary framework for data-limited stocks</li> <li>• TACs are set broadly in line with ICES advice</li> <li>• Quotas are rarely exceeded</li> <li>• There is no evidence of IUU (see PI3.2.3)</li> <li>• ObsMer provides information on discarding and ETP interactions</li> <li>• VMS is in place</li> <li>• Management measures are being put in place to comply with EU requirements under Natura 2000 and the MSFD Action Plan</li> </ul>		

		for the Channel and North Sea marine sub-region On this basis, the team concluded that SG80 is met. Since management measures for the SACs and under the MSFD are not yet in place, it is not possible to evaluate how these will be implemented, so SG100 is not met.
<b>References</b>		DIRM-MEMN, 2012. Plan d'action pour le milieu marin. Evaluation initiale des eaux marines. Sous-région marine Manche-mer du Nord. Directive cadre stratégie pour le milieu marin. Direction interrégionale de la mer (DIRM) Manche Est – mer du Nord, 863p. DIRM-MEMN, 2015. Plan d'action pour le milieu marin. Programme de surveillance. Sous-région marine Manche-mer du Nord. Directive cadre stratégie pour le milieu marin. Direction interrégionale de la mer (DIRM) Manche Est – mer du Nord, 442p. North Sea sole and plaice management plan French eastern Channel sole management plan ICES, 2015h Ifremier, 2012b
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

**Evaluation table 27 - PI 2.5.3**

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The ecosystem is considered by most researchers to be driven largely by bottom-up factors (productivity, physical processes and climate), but it is certainly true that fishing pressure has played a significant role in structuring this ecosystem over the years, and most likely continues to do so (see Section 1.1.7 of the main report). At least one ecosystem model of the North Sea exists (Mackinson and Daskalov 2007), based on information about trophic relationships of the main species, which can be used to explore ecosystem function and patterns of productivity, as well as fishery impacts. Information on key elements of the ecosystem continues to be collected under the Marine Strategy Framework Directive (see PI 2.5.2, scoring issue a) and the Habitats and Birds Directives. Information is thus adequate to broadly understand the key elements of the ecosystem. ICES also play a role; e.g. WGBYC evaluate bycatch, WGSAM evaluate species interactions and how to incorporate them into stock assessments. SG80 is met.		
b	Guide post	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	N
	Justification	The main potential impacts of the fishery on the ecosystem are evaluated in 2.5.1 above, and in Section 2.4.6 of the main report. Some are evaluated in detail (e.g. under project FilManCet, via ICES assessments). SG80 is met. Not all have been investigated directly (e.g. impacts of the fishery on benthic ecosystems in sandy areas) so SG100 is not met.		

<b>c</b>	<b>Guide post</b>		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	It is known for sole and all the main retained species and ETP species their main predators and prey, habitat requirements and interactions. It is not thought that any of them play a key role in structuring the ecosystem, although there are likely to be some impacts from fisheries in general. An ecosystem model allows their main function in the ecosystem to be understood. SG100 is therefore met.		
<b>d</b>	<b>Guide post</b>		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	<b>Met?</b>		Y	N
	<b>Justification</b>	As per scoring issue c, sufficient information is available on the impacts of the fishery on retained species, bycatch and ETP species to allow the main consequences for the ecosystem components to be inferred. As such SG80 is met. It is not clear, however, whether all the main consequences can be inferred (e.g. the long-term consequences for benthic ecosystems in sandy areas). SG100 is therefore not met.		
<b>e</b>	<b>Guide post</b>		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	Information on key elements of the ecosystem continues to be collected under the Marine Strategy Framework Directive (see PI 2.5.2, scoring issue a), the EC Habitats and Birds Directives. Sufficient data are therefore collected for any increase in risk level to be detected. SG80 is met. Under the Marine Strategy Framework Directive, information has been collected and analysed for the elaboration of an action plan to achieve 'good ecological status' of the French North Sea/Channel sub-region by 2020. This information is already available is the relevant report for the sub-region: <a href="http://webissimo.developpement-durable.gouv.fr/IMG/pdf/Evaluation_initiale_Manche_-_mer_du_Nord_cle72511e.pdf">http://webissimo.developpement-durable.gouv.fr/IMG/pdf/Evaluation_initiale_Manche_-_mer_du_Nord_cle72511e.pdf</a> . The report provides in-depth analysis on the ecological characteristics and status of the marine environment within the sub-region and the anthropogenic influences acting on this		

		environment. Based on this report, environmental objectives and management measures are being identified which will ultimately permit the achievement of 'good ecological status' by 2020. The available information is therefore sufficient to support the development of strategies to manage ecosystem impacts. SG100 is also met.
<b>References</b>	ICES, 2015h ICES, 2014i Ifremier 2012b. <a href="http://webissimo.developpement-durable.gouv.fr/IMG/pdf/Evaluation_initiale_Manche_-_mer_du_Nord_cle72511e.pdf">http://webissimo.developpement-durable.gouv.fr/IMG/pdf/Evaluation_initiale_Manche_-_mer_du_Nord_cle72511e.pdf</a>	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

Evaluation table 28 - PI 3.1.1

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> <li>• Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and</li> <li>• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>• Incorporates an appropriate dispute resolution framework.</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	<p>The fishery is managed through the comprehensive European Common Fisheries Policy (CFP) regulation and associated directives for ecosystem management ('Birds', Habitats' and MSFD). European fisheries management regulations have direct effect in European member states legal systems, and the directives have all been incorporated into French legislations (Code de la Pêche et Code de l'Environnement). For EU-managed fisheries, the most important cooperation fora are the Advisory Councils, here the North Western Waters (NWWAC) for area VIId (eastern Channel) and the North Sea (NSAC) for area IVc, which bring together interested environmental and social NGOs. All interested stakeholders can have observer status at ICES and the scientists make regular presentations and provide support to the Advisory Councils. Finally, the EU and France contribute actively to the delivery of their commitments to several international Conventions relevant to Principle 2 (see 2.5.1).</p> <p>The French legal framework is given by the Code rural et de la pêche maritime Livre IX and the Code de l'environnement, implemented by the central (DPMA) and devolved administrations (DIRM Manche Est – Mer du Nord, DDTM-DML59, 62 and 76), and fishing industry co-management committees - CRPM Nord Pas de Calais Picardie (NPCP) and Haute Normandie (HN) that together recognise and effectively propose bylaws aimed at achieving sustainable fisheries. Local management measures proposed by the CRPMs in their 'délibérations' become bylaws upon agreement of the government representative (Préfet de région) and concern catch limits, closed areas and closed seasons and other conservation measures for the target and retained species.</p> <p>Individual vessel quotas for the UoC are managed by the Producer Organisation (PO) FROM Nord who has systems aimed to maximize market value and organize sustainable fishing activities. The PO and CRPMs participate to each other's meetings, and have a close working cooperation with scientific and training institutions (through Pôle Aquimer see Table 6).</p> <p>In addition, the CRPMs and PO cooperate with a wide range of parties, routinely and through specific projects (research and training</p>		

		organisations, Ifremer, Protected marine areas Agency (AAMP), Marine Park, European and French fisheries surveillance organisations). Overall, the team considers that i) there is a coherent and effective European and national legal system, ii) there are binding procedures for cooperation at the EU, national and local levels, and iii) the French system delivers effective management of the fishery, consistent with P1 and P2, as shown above, SG 100 is met.		
b	<b>Guide post</b>	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>There are dispute resolution mechanisms in the French management system at local and regional levels (PO “decisions”, CRPEM “deliberations” on gear conflicts and licences, and French administrative decisions from CRPEM recommendations and DIRM-DDTM/DML management measures and enforcement). If a member does not like the approach of the PO, or the decisions taken, the member is free to leave the organisation and take its quota entitlement to another PO. In fact, when FROM Nord introduced individual vessel quotas there was considerable dispute within the membership, and all disputes were eventually resolved by discussion and compromise. In other words, the system has been tested and proved to be effective.</p> <p>The regional and national licensing proposals are examined by mixed government/industry commissions prior to decisions being made, but disputes can be brought up by individuals against the CRPM, the PO, and the authorities and resolved through conciliation, or through administrative or criminal (for non-compliance offences) courts. The PO may also appeal a government decision regarding quota distribution in the administrative courts, which happened in the past. A case may also be brought to the European Court of Justice by individuals or between MS for dispute resolution regarding an interpretation of EU law. SG100 is met.</p>		

d	<b>Guide post</b>	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The European quota system allocates shares of the TACs to member states. The EU quota system allocates national shares of the sole TAC for areas VIId (eastern Channel) and IV (North Sea) on the basis of the member states historical track records.</p> <p>The French national administration distributes sub-quota allocations to POs, and in turn the FROM Nord PO allocates vessel quotas to its membership according to pre-agreed rules and track records that observe legal historic rights explicitly. The smaller artisanal vessels (under 10m) are allocated quota on the same basis as the larger ones. There is a small regulated recreational netting fishery from the shore, with annual netting rights also awarded by the DDTM/DMLs on the basis of historical involvement. SG80 is met.</p> <p>The team considered that the French management system does not 'formally commit' to the customary rights of fishers in relation to quota, because in France the state retains ownership of quota and can in theory redistribute quota on any basis they wish. There is no evidence that this is likely to happen in this fishery, but it has in the past happened in other fisheries that quota has been allocated for political reasons. SG100 is not met.</p>		
<b>References</b>		<p>CFP Regulation (EU) No 1380/2013, 'Birds' Directive 2009/147/EC, 'Habitats' Directive 92/43/EEC, MSFD 2008/56/EC</p> <p>French Code rural et de la pêche maritime Livre IX and Code de l'environnement (see section 2.5.1.1)</p> <p>FR - Arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêche de la sole commune (Solea solea) en Manche Est (division CIEM VII d) and locally CRPM délibérations and arrêtés local systems</p> <p>FR DML62, Arrêté du 21 janvier 2015 complétant l'arrêté du 26 novembre 2014 portant délivrance des autorisations de pose d'un filet fixe dans la zone de balancement des marées dans le département du Pas-de-Calais pour l'année 2015</p>		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 29 - PI 3.1.2

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	N
	Justification	Functions, roles and responsibilities are well understood within the European and French systems. This applies to most areas of activity, as set out in detail in the main report, so SG 80 is met. In relation to SG100, the process for data handling and data entry for small-scale fisheries remains complex and confusing, creating delay and often a need for duplicate data entry between DPMA, France-Agrimer, the DDTM/DMLs, CRPMs and the PO. Until the French data system SIPS is fully functional and FranceAgrimer is able to deliver crosschecked information in a timely fashion, for this aspect, SG100 is not met.		
b	Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	Y
	Justification	The FROM Nord sole fishery is managed at European level, and for French-registered vessels, by the national French administration DPMA with its devolved administrations (DIRM-DDTM/DML), in conjunction with the two CRPMs and the PO. For the French system it is apparent that the functions, roles and responsibilities are clearly defined and are well understood in all areas. At European level, local fishermen and environmental NGOs are actively involved in the Advisory Committees (Western Waters AC for Area VIId, North Sea AC for area IVc) regarding TAC and quotas and EU regulatory measures to reduce the fisheries impacts on the ecosystem. From regular work with French Ifremer and other scientists, stakeholders know how their information are used (or not) at		

		local, national and European levels. SG100 is met.		
c	Guide post		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	Y
	Justification	The PO, CNPEM, regional and local administrative services in charge of data collection and analysis, of monitoring control and surveillance, and the Marine Protected Areas agency (AAMP) are consulted prior to European ministerial meetings, briefed by the DPMA on future implications of outcomes and solicited to help draft local or national management measures (for example 2015 Sole management regime in VIId), MPA management committees also have a wide stakeholder representation. SG100 is met		
References		Code rural et de la pêche maritime application decree n° 2014-1608. Décret n°2011-776 du 28 juin 2011 fixant les règles d'organisation et de fonctionnement du Comité national des pêches maritimes et des élevages marins ainsi que des comités régionaux, départementaux et inter-départementaux des pêches maritimes et des élevages marins; French PO; Arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêche de la sole commune (Solea solea) en Manche Est (division CIEM VII d) Membership, communications and minutes from the North Western Waters and the North Sea Advisory Councils.		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				N/A

Evaluation table 30 - PI 3.1.3

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Guided post	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	Y
	Justification	<p>The CFP has a comprehensive and explicit set of objectives consistent with MSC Principles 1, 2 and 3 that is required by the management system regarding, for example, use of the precautionary approach (required by the European Treaty), protection of the marine environment, ecosystem-based approach to fisheries management, guided by principles of good governance including decision-making based on best available scientific advice, broad stakeholder involvement and a long-term perspective (see 2.5.1.3). The objectives of the French fisheries policy are clearly set out in the Code Rural et de la Pêche and the Code de l'Environnement (in conformity with the CFP and international obligations), to exploit fisheries sustainably. The French Ministry website refers to the 'transition écologique' (ecological transition), which includes among its objectives the preservation and restoration of ecosystems. In addition, the Natura 2000 framework (under the Habitats and Birds Directives) aims to protect ETP species and habitats, and the MSFD sets out the objective for the Manche-Mer du Nord marine sub-region fisheries to reach Good Environmental Status by 2015, 2020 at the latest.</p> <p>Locally, the CRPEMs operate French policy and thus under the CFP. The FROM Nord also has clear objectives as follows:</p> <ul style="list-style-type: none"> <li>to take measures to ensure the sustainable operation of the fishery, and the improvement of conditions of sale for its members</li> <li>to represent members to the EU and the national/local authorities, both collectively and separately as required</li> </ul> <p>Based on the overarching objectives of the reformed CFP, the team concluded that SG100 is met.</p>		
References		<p>EU CFP Reg (CE) n° 1380/2013 du Conseil du 20 décembre 2013 and other EU legislation (including but not limited to, the Habitats Directive, Birds Directive and Marine Strategy Framework Directive)</p> <p>FR Code rural et de la pêche maritime general dispositions Article L911-2 and livre IX, 2014</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				N/A

Evaluation table 31 - PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	Y
	Justification	<p>In terms of positive incentives towards sustainability, the management system provides:</p> <ul style="list-style-type: none"> <li>• A stable and transparent management framework</li> <li>• Reasonable confidence about renewable fishing rights (even though the state retains quota ownership)</li> <li>• A strong monitoring, control and surveillance system (see below for more details)</li> <li>• Strong co-management institutions to organise the market and fishing activities (PO), research and conservation measures (CRPMs) including ecosystem aspects, which link fishing authorisations to good conduct and compliance (see 2.5.1.4).</li> </ul> <p>Potential perverse incentives are as follows:</p> <ul style="list-style-type: none"> <li>• The European Maritime and Fisheries Fund (EMFF; formerly the European Fisheries Fund EFF) subsidies for new engines and fleet withdrawal</li> <li>• Minimum market price - prix de déclenchement (formerly prix de retrait), also through EMFF financing</li> <li>• Fuel duty exemption – an EU wide policy for Agriculture and Fisheries.</li> </ul> <p>Perverse incentives are reviewed at EU level as part of the review and reform of the CFP, in the ex-post evaluation of the EFF and ex-ante evaluation of the EMFF and as part of each member state EU-funding Operational Programme, specifically linking management plans and fishing capacity through annual reporting. On this basis, the team considered that SG100 is met.</p>		
References		<p>EU Regulations 508/2014, Regulation 1380/2013</p> <p>Ernst and Young, et al. 2011. Interim evaluation of the European Fisheries Fund (2007-2013) Synthesis of the 26 national evaluation.</p> <p>Review of EU fisheries subsidies: <a href="http://www.europarl.europa.eu/RegData/etudes/divers/join/2013/513980/IPOL-">http://www.europarl.europa.eu/RegData/etudes/divers/join/2013/513980/IPOL-</a></p>		

PECH_DV%282013%29513980_EN.pdf , and information at <a href="http://cfp-reformwatch.eu/2009/12/the-new-reform/">http://cfp-reformwatch.eu/2009/12/the-new-reform/</a>	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/A</b>

Evaluation table 32 - PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
	Met?	Y	Y	P
	Justification	<p>For Principle 1, objectives are set out in the management plans for the fishery, regarding Fishing mortality minimum levels of Spawning Stock Biomass (SSB), for:</p> <ul style="list-style-type: none"> <li>the eastern Channel in Area VIId (EU Management Plan expected 2015, French MP from 1<sup>st</sup> Feb. 2015), and</li> <li>the North Sea Area IV (EU).</li> </ul> <p>In addition, the target reference point (see PI 1.1.2) can be considered to be a quantitative objective for Principle 1, since the TAC is set in such a way as to maintain the stock at this level. Underlying these fishery-specific objectives is the overarching objective in the CFP of maintaining stocks at the MSY level. The team considered that these objectives are i) clearly defined, ii) measurable (because quantitative), iii) demonstrably consistent with Principle 1 outcome requirements (see scoring for Principle 1), and iv) explicit. On this basis, SG100 is met for Principle 1 objectives.</p> <p>For Principle 2 a series of objectives apply to these stocks under the CFP:</p> <ul style="list-style-type: none"> <li>CFP has the objective of maintaining all commercially exploited stocks at a level consistent with MSY</li> <li>The landing obligation (or 'discard ban') is being introduced in 2016 for this fishery (VIId and IVc), with the objective of reducing unwanted catch and waste and reducing fishing mortality on stocks for which there is extensive discarding.</li> </ul> <p>The fishery has been documented to interact with cetaceans, seabird and other ETP species, for which clear objectives are set under the EU Birds and Habitats Directives that govern the management of numerous Marine Protected Areas (Natura2000 and Marine Park) that overlap with the fishery. Overall, the team concluded that in relation to P2, the fishery operates in a wider general framework that provides a number of P2 objectives (protected areas and species, fisheries regulations and the CFP – see rationale for 3.1.3), while more specific objectives are provided (e.g. in management plans) as required. The team on this basis concluded that these objectives are i) short- and long-term, ii) consistent with the required outcomes for P2 (see scoring for P2), and iii) explicit, hence SG80 is met. Several of these objectives, however, are 'higher-level' objectives (e.g. 'favourable conservation status' under the Habitats Directive), and haven't been quantified yet in the MSFD programme of measures however, so SG100 is not met for P2 objectives.</p>		

	This gives an overall score of 90.
<b>References</b>	Council Regulation (EC) No. 676/2007 - establishing a multiannual plan for fisheries exploiting stocks of plaice and sole in the North Sea; ICES Bycatch WG (see Principle 2) and EU Regs: Regulation 850/1998, Regulation 1380/2013 (CFP) also refs in 3.1.3 NWWAC_ExCom_Drafting_Group_Submission_to_MS_Group_04_02_2015_EN.pdf and Scheveningen Group, 2015. Joint recommendation Discard Plan for Demersal Fisheries in the North Sea MSFD initial assessment and monitoring program for the Channel – North Sea sub-region, see DIRM-MEMN (2012 and 2015).
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	
<b>90</b>	
<b>CONDITION NUMBER (if relevant):</b>	
<b>N/A</b>	

**Evaluation table 33 - PI 3.2.2**

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	<p>There is a clear decision-making process based on the management plan. The management plan is discussed with stakeholders at the Advisory Councils (NWW and NS), reviewed by ICES to ensure conformance with the precautionary approach, and by STECF. The ICES advice and management plan produce a recommended TAC shared between EU member states. The French share of the TAC is divided between the POs (FROM Nord for this fishery), for the PO in turn to divide it between its member vessels according to their track records.</p> <p>For decisions relating to P2, there are established processes both at EU level (e.g. revision of the CFP leading to the landing obligation – discard ban) and at French level there are establish processes for debating and setting local and national fisheries regulations such as for the Natura 2000 system of protected areas, for temporal and seasonal closures, and gear specifications for example.</p>		
b	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	Y
	Justification	<p>At EU level, the system responds to issues on wider implications through the decadal policy review process, regularly through the two advisory committees (NWW and NS) and EC negotiations with MS prior to annual TAC announcements. There is also wide ongoing reform regarding the ‘landing obligation’ particularly in the more difficult mixed demersal fisheries such as for sole. At national level, the French system has been very reactive to the state of the stock in VIID, and has, following negotiations with Belgium, introduced management measures to accompany the EU TAC decrease in area VIID ahead of a forthcoming EU management Plan, through a transparent consultation process involving all co-management institutions. SG 100 is met.</p>		

c	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	The management plan for NS sole (IV) has been reviewed by ICES and is consistent with the precautionary approach. The same process is being used for the forthcoming eastern Channel sole (VIId) management plan. The information used in the stock assessment (used to provide ICES advice) is set out in the rationales for Pls 1.2.3 and 1.2.4 above. SG80 is met.		
d	Guide post	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	Y
	Justification	<p>Stock status: ICES advice and Working Group reports are available online</p> <p>Management actions: The management plan is provided in the ICES advice. Requests for review of revisions to the management plan are available online at the ICES website. Information on previous years' TACs are also in the ICES advice, and information on the current TAC and national quotas are available on the European Commission website, as are relevant regulations (e.g. Regulation 850/1998). French national decisions (e.g. regulations, key for division of quota) is also available publicly via the Journal Officiel of government proceedings. For decisions made at local level in France, the DIRM arrêtés are published in the official journal, and the CRPMs 'comptes rendus' of meetings providing information on decisions made and the basis for these decisions are available to members and to the general public on request.</p> <p>Landings: Information on landings from this fishery for all species is available to stakeholders almost in real time (e.g. members of FROM Nord, DMLs, CROSS, DPMA). It is available to the general public via national statistics after some months' delay. The FROM Nord annual report also includes information about landings of its members, as well as prices etc. This is available to members and to the general public on request.</p> <p>Overall, on this basis, the team considered that SG100 is met.</p>		

e	<b>Guide post</b>	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Stakeholders were not aware of any legal challenges in the fishery, so SG80 is met by default. FROM Nord noted that the issue that has so far caused the most conflict in this fishery is the decision to introduce individual vessel quotas for FROM Nord members. This issue was resolved by negotiation, and is now enforced via the 'surtaxe' system also introduced by negotiation and agreement of the PO members. More generally, the team noted that overall the level of consultation and engagement of stakeholders in the fishery decision-making is high and that this would be likely to result in legal disputes being proactively avoided by consultation and negotiation. A wide range of stakeholders are also involved at European level through the Advisory Committees. SG100 is met.		
<b>References</b>		ICES advice for VIId and IV, NWW and NS AC docs, FR 2015 arrêté for VIId, Deliberations CRPMs with arrêtés on <a href="http://www.prefectures-regions.gouv.fr/normandie/Documents-publications/Recueil-des-Actes-Administratifs/Recueil-des-Actes-Administratifs-2015/Recueil-des-actes-administratifs-2015">http://www.prefectures-regions.gouv.fr/normandie/Documents-publications/Recueil-des-Actes-Administratifs/Recueil-des-Actes-Administratifs-2015/Recueil-des-actes-administratifs-2015</a>		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Evaluation table 34 - PI 3.2.3**

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	N
	Justification	<p>A comprehensive MCS system is in place. The European Fisheries Control Agency (EFCA) is coordinating MCS activities through Joint Deployment Plans (JDP) for in Western Waters (incl. VIIId) and for cod, sole and plaice in the North Sea (incl. IVc).</p> <p>At sea: From 1<sup>st</sup> April 2015 all vessels will be equipped with VMS, which is monitored by CROSS. The vessels are also inspected at sea (by the patrol vessels Armoise and Cormoran) inspection forms</p> <p>Landings: Vessels must report a landing a minimum of two hours in advance, and landings are inspected by DML using risk analyses carried out by CROSS. Skippers must fill out electronic logbooks and logbook data are cross-checked and corrected with landing declarations and sales slips (e.g. data from the auctions and buyers/sellers) by both DPMA and FROM Nord – for the purposes of quota consumption the larger of the two figures is taken where there is a discrepancy. Data are entered into a central database called SIOP ('Système Informatique des OP' – PO IT system) run by DPMA. Gear may also be checked by DML inspectors (e.g. in relation to length and mesh size).</p> <p>Sanctions: Administrative and legal sanctions available, although none have been applied recently in this fishery (conversely, no infractions have been noted recently, according to DML).</p> <p>Overall, the monitoring and control system in this fishery is strong, and it appears to be effective, but there is no risk-based approach that can demonstrate a consistent ability to enforce yet. SG80 is therefore met, but SG100 is not met.</p>		

<b>b</b>	<b>Guide post</b>	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>As noted above, the French system allows for either administrative or legal sanctions, or both. France, along with other Member States of the EU, is in the process of applying a points-based system for applying sanctions. Each infraction results in the allocation of a number of points, depending on the type of infraction, the severity and past record. Licences are suspended for a given period of time depending on the number of point accumulated, from 2 months to permanent, without prejudice to legal procedures (prosecution). In addition, FROM Nord applies sanctions on its members via a 'surtaxe' system in the herring fishery to try and ensure that members comply with the individual vessel quotas, and other rules (e.g. non-declaration of landings, non-payment of membership fees), but it hasn't been necessary for sole. The sanctions range from verbal warning to fine (non-reimbursement of surtaxe) and eventual exclusion from FROM Nord.</p> <p>The team enquired about how these sanctions have been applied in recent years. It was hard to find examples because few infractions occurred – to that extent, the system is successful. From the point of view of FROM Nord, the recent repeated reduction in annual VIId sub-quotas are difficult, and the implementation of VMS will take time, but the measures are seen as important by the fishermen who suggested them.</p> <p>The overall system is said to be effective in the area because the agencies involved (Fisheries patrols, maritime police, customs, CRPMs, PO) collaborate closely and work with the vessels from Boulogne. The team considered that sanctions appear to be consistently applied at several levels, and given that levels of non-compliance in the fishery are very low, demonstrably provide effective deterrence. SG100 is met.</p>		
<b>c</b>	<b>Guide post</b>	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>As noted above, all the evidence suggests that compliance is good. A review of the last two years by DML (pers. comm.) for this fleet showed no compliance issues, and FROM Nord have likewise had no recent issues in relation to quota allocations (pers. comm.). There are inspections at sea, during which catch and gear are inspected (inspection reports provided to the team). Information: The system for providing data via electronic logbooks, landings data from auctions and SIOP is described above, and appears to be effective and reliable. However, the current deadlock between CRPM HN and BN over licensing conditions, which</p>		

		revolve in part around the difference in mesh sizes, need to be resolved to have a high degree of confidence that HN fishers comply in BN waters. Only SG80 is met, and a recommendation is issued, for FROM Nord vessels to do all in their power for common licensing conditions to be agreed as soon as possible.		
d	Guide post		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	The fishery is technically in non-compliance with EU Regulation 812/2004 aiming to understand and reduce incidental catches of cteaceans in netting fisheries, including by placing acoustic deterrent “pingers” on fishing nets including in the Channel and area VIId. However, the fishery tested the pingers available and initiated a research and scientific observation project 'FilManCet' with the French national research institute Ifremer.The FilManCet study provided objective evidence i) that interactions with porpoises are very low in the area of operation of the fishery and ii) that pingers are unlikely to make any difference to by catch rates (ICES WGBYC, 2013, 2014 and 2015). The team concluded that since i) France has presented (and keeps collecting) data to demonstrate a very low level of interactions in VIId (one porpoise in 2212 GTR_Soles observed operations in area VIId between 2008 and 2013, see Morizur et al., 2014 and ICES, 2014i); ii) the Commission (ICES WGBYC, 2014) and French authorities (pers.com. DDTM-DML) do not enforce the compulsory pinger aspect of the regulation, which is currently under review as part of the review of technical measures; then de facto the requirement no longer applies in this fishery. Therefore on this aspect (or other regulatory management measures) there is no evidence of systematic non-compliance. SG80 is met.		
References		EU Points-based system: Regulation 2012/2009 ICES, 2014i. Bycatch of small cetaceans and other marine animals – Review of national reports under Council Regulation (EC) No. 812/2004 and other published documents. Morizur Y., Gaudou O., Demaneche S, 2014. Analyse des captures accidentelles de mammifères marins dans les pêcheries françaises aux filets fixes, 30 p. ICES WGBYC, 2013, 2014 and 2015 French MCS <a href="http://www.developpement-durable.gouv.fr/Encadrement-reglementaire.html">http://www.developpement-durable.gouv.fr/Encadrement-reglementaire.html</a> DIRM Control plan for sole		
OVERALL PERFORMANCE INDICATOR SCORE:				
85				
CONDITION NUMBER (if relevant):				
N/A				

**Evaluation table 35 - PI 3.2.4**

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Guide post</b>	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>ICES is a centre point where research results are shared, priorities are identified and MS research activities are coordinated. The ICES stock assessment process shows that a comprehensive research plan exists with a strategic approach to P1 aspects for the eastern North Sea and Vllid stocks separately (see section 1.1). Data are integrated and analysed for and by ICES WG, including fisheries data collected through the EU Data Collection Framework programmes, and fisheries-independent data. The French national research institute – Ifremer – contributes to joint research cruises and projects, and through the French OBSMER programme of on-board observers research and data collection</p> <p>Further research on P2 does exist at ICES and member state levels; surveys for the assessment of main retained stocks, and ecosystem models of the North Sea (ICES, 2008, Mackinson and Daskalov, 2008) and Channel (Araujo, 2007) ecosystem (see section 1.1). From 2015/2016, ICES will systematically complement its advice on stock assessment with ecosystem considerations. These mechanisms illustrate that P1 &amp; P2 aspects are addressed in a strategic manner in what equates to a research plan. That plan does provide the management system with timely information in order to achieve P1 &amp; 2 objectives. On this basis, SG80 is met.</p> <p>There is some research on P3 issues, but these are not part included in a comprehensive plan, SG 100 is not met.</p>		

<b>b</b>	<b>Guide post</b>	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	As noted above, ICES working group reports and advice are available free of charge online. Ifremer publishes a summary of all ICES's advice for the year in French. Release dates are set out in advance and are respected. Although documented in a written form for all the stocks concerned, the research plan has to be inferred from other documents and therefore cannot be described as 'widely and publically available'.		
<b>References</b>		Ifremer - OBSMER programme Araujo et al, 2007. Exploring fisheries strategies for the western English Channel using an ecosystem model. Ecological Modelling 210(4):465–477; ICES, 2008. North Sea Ecosystem overview, ICES Advice Book 6, 24p.; Mackinson and Daskalov, 2008. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management, 200p.		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation table 36 - PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N
	Justification	EU: extensively reviewed and revised during the renewal of the CFP; ICES advice: reviewed regularly by STECF (Scientific, Technical and Economic Committee for Fisheries); Performance of management: ICES compare annually the status of the stock in relation to targets (reference points). This may result in the review and revision of the management plan, if it is shown not to be working successfully. The performance of management in relation to the functioning of the fishery (e.g. economic) is subject to ongoing review by STECF and the Advisory Committees (NWW and NS). The European Fisheries Control Agency has 5 year reviews. French national system: The French national system was subject to an extensive reorganisation during 2010-12 after an in-depth review. The French government also have an audit system, which may review some aspects of government actions on a periodic basis ('Mission d'enquête ministérielle' and Audit Office). FROM Nord: FROM Nord conducts a review of all their decisions every year (pers. comm.). The team considered that SG80 is met, but that SG100 might not be met on an ongoing basis in relation to the French national management system.		
b	Guide post	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N
	Justification	ICES Scientific advice and resulting management measures are subject to regular internal and periodic external review by STECF. The EU reviews the French (other Member States) system of statistics and data collection, and the French enforcement system periodically. The French government also has a system for periodic external review (Audit Office = Court des Comptes) of their systems. FROM Nord has an internal review system against its own annual management plan, and all POs in France are subject to annual accreditation by DPMA, following an external audit by FranceAgrimer - although this is reported to be something of a formality in practice. However, the client reports that the POs and the DPMA 'review' each others' work on a regular basis, in that they are in		

		constant contact in relation to decisions in the pipeline, the data management system, possible errors and so on (pers. comm.). SG80 is met. Overall, the system has multiple sources of both internal and external review, covering all the significant aspects of the system – however, not all of them can be described as 'regular' or fully 'external'. SG100 is not met
<b>References</b>	ICES, STECF, FROM-Nord. EFCA and CNS annual reports	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

## Appendix 1.2 Conditions

As set out above, the assessment team have concluded provisionally that the fishery should be certified, subject to two conditions, both for Principle 1 for the eastern Channel stock only (VIlId sole). These are given below, together with the corresponding milestones and client action plan.

**Table A1.2: Condition 1 – VIlId sole**

Performance Indicator	PI 1.2.1 There is a robust and precautionary harvest strategy in place
Score	70
Rationale	<p>Whilst there is no formal management plan for VIlId sole, the elements of a harvest strategy are in place (information; stock assessment; harvest control rule and management actions: annual TAC and technical measures linked to defined reference points for SSB and F) with the aim of maintaining SSB above the precautionary level through control of fishing mortality, which is reduced as limit reference points are approached. It is clear that the TAC been varied to respond to ICES' advice, which is based on estimates of the biomass level, and is responsive to the state of the stock (SG80a is satisfied).</p> <p>However, SG80b requires that evidence exists that the harvest strategy is achieving its objectives and, whilst the SSB has been maintained at or above the defined precautionary level for this stock (and is not forecast to drop below <math>MSYB_{trigger}</math> (8000 t) in 2017 under any of the management scenarios set out by ICES in their 2015 advice), fishing mortality has been estimated to be above the <math>F_{pa}</math> (0.4) since 2006 and is well above <math>F_{MSY}</math>, which is the formal target reference point. ICES advice following the MSY approach for 2015 implied a TAC of 2706 t, but the 2015 TAC was set at 3483 t, equivalent to an estimated F of 0.55 (= Flim).</p> <p>Consequently, although the harvest strategy is working to achieve biomass objectives, the objectives of the MSY approach (i.e. <math>F_{MSY}</math>), which has been the basis of scientific advice since 2012, cannot be met by management of the stock as it is at present. Therefore, SG80b is not met and a condition is required.</p> <p>Score: 70</p>
Condition	The actions necessary to achieve the stated long-term (MSY) objectives for the VIlId sole stock need to be clearly defined via a management plan or by some other suitable method, in order to provide evidence that the harvest strategy can achieve its objectives (SG80 scoring issue b).
Milestones	<p>Meeting this condition will require implementation of an appropriate management plan or strategy for VIlId sole. The anticipated milestones are set out below:</p> <p>Year 1: Evidence that the client is working with the French authorities, the AC or other suitable stakeholders to encourage the EU and ICES or the relevant coastal states to develop a management plan or clear strategy for VIlId sole. <b>Likely resulting PI Score: 70</b></p> <p>Year 2: Evidence that a management plan or strategy for VIlId sole is under development. <b>Likely resulting PI Score: 70</b></p>

	<p>Year 3: Evidence of the management plan or strategy being reviewed and evaluated by stakeholders. <b>Likely resulting PI Score: 70</b></p> <p>Year 4: Evidence that the management plan / strategy has been adopted. <b>Likely resulting PI Score: 70</b></p> <p>Year 5: Evidence that the fishery is being managed according to the management plan / strategy and that the harvest strategy is achieving or is likely to achieve its objectives of maintaining SSB at or above <math>MSY_{trigger}</math> (currently 8000 t) and fishing mortality at or below <math>F_{MSY}</math>. <b>Likely resulting PI Score: 80</b></p>
<p><b>Client action plan</b></p>	<p>Year 1 (2015/2016):</p> <ol style="list-style-type: none"> <li>1. Participation and discussions in the NWWAC on measures to be included in the management plan. FROM Nord is represented by François Hennuyer, managing director. FROM Nord is a key stakeholder for the management of eastern Channel sole, given that their quota allocation for 2015 represents 52% of the TAC and 62% of the French quota. At the request of the CRPM Nord-Pas de Calais, DPMA has requested Ifremer to evaluate management measures for the stock. The response of Ifremer (June 2015) is attached (see Appendix 6 Consultation on Conditions). Additional measures have been propose by the three POs and three CRPM. The full set of management options was presented to the NWWAC working group by François Hennuyer (FROM NORD) and Olivier Leprêtre (president of CRPM Nord-Pas-de-Calais), leading to the advice provided by the NWWAC to the Commission (19 June 2015 – see Appendix 6 Consultation on Conditions). This advice is the result of Ifremer's proposals, as well as those from the French, Belgian and English fisheries. (Participation et discussions au sein du Conseil Consultatif pour les Eaux Occidentales Septentrionales (CCEOS) sur les mesures à proposer dans le cadre d'un plan de gestion. Le FROM NORD est représenté par François Hennuyer, directeur délégué. Le FROM NORD est très impliqué dans la gestion de la sole Manche Est dans la mesure où le quota 2015 représente 52% du TAC et 62% du quota national. A la demande du CRPM Nord-Pas-de-Calais, la DPMA a saisi Ifremer sur l'évaluation de mesures de gestion pour le stock de sole Manche Est. Une réponse de l'Ifremer a été rédigée en juin 2015. Cette réponse a été complétée par des mesures supplémentaires émanant des professionnels des trois Organisations de producteurs et des trois CRPM. L'ensemble a été présenté au groupe de travail du CCEOS par François Hennuyer, directeur délégué du FROM NORD et Olivier Leprêtre président du CRPM Nord-Pas-de-Calais (avis du 19 juin 2015).L'avis du 19 juin 2015 est le résultat des propositions d'Ifremer, des professionnels français mais aussi belges et anglais).</li> <li>2. Presentation of advice to and discussions with STECF (Présentation d'un avis et discussions avec le Comité Scientifique, Technique et Economique de la Pêche (CSTEP)).</li> <li>3. Participation in project SMAC (improving information for better management of the stock – eastern Channel sole). This project is being implemented by Ifremer. FROM Nord is represented by François Hennuyer and along with CRPM Nord-Pas de Calais has participated very actively in the project working group, in defining the main research priorities for the stock (see Appendix 6 Consultation on Conditions). The project will start in December 2015 and is foreseen to last 3 years. The English industry is working on the</li> </ol>

	<p>development of a similar research project with their administration.</p> <p>(Participation au projet <b>Sole de Manche Est – Amélioration des Connaissances</b> pour une meilleure gestion du stock (<b>SMAC</b>). Ce projet est porté par Ifremer. Le FROM NORD représenté par François Hennuyer, directeur délégué et le CRPM Nord-Pas-de-Calais ont participé de manière très active au sein du groupe de travail dans l'élaboration des différents axes de recherche du projet. (cf pièce jointe). Début du projet en décembre 2015 pour une durée prévue de 3 ans. Les professionnels anglais ont pris l'engagement de demander à leur administration la mise en place d'une étude similaire.)</p> <p>4. All decisions from the EU will be implemented. (Préparation et mise en place des décisions du Conseil de fin d'année.) Year 2 (2016/2017): Provide evidence that the strategy or management plan is being developed. (Apporter la preuve que la stratégie ou plan de gestion est en cours de développement.)</p> <p>Year 3 (2017/2018): Provide evidence that the strategy or management plan is being evaluated by the relevant stakeholders. (Apporter la preuve que la stratégie ou plan de gestion est en cours d'évaluation par les différentes parties prenantes.)</p> <p>Year 4 (2018/2019): Provide evidence that the strategy or management plan has been adopted by the relevant stakeholders. (Apporter la preuve que la stratégie ou plan de gestion a été adoptée par les différentes parties prenantes.)</p> <p>Year 5 (2019/2020): Provide evidence that the management of the fishery conforms to the management plan and that it is likely to achieve its objectives. (Apporter la preuve que la gestion de la pêche est conforme au plan de gestion et que la stratégie de gestion achève ou va probablement les objectifs.)</p>
<p><b>Consultation on condition – see Appendix 6 Consultation on Conditions</b></p>	<ul style="list-style-type: none"> <li>• Evidence of engagement of CRPM Nord-Pas de Calais, other CRPM and POs in France, and UK and Belgian industries: Document 1. Participation list for NWWAC Working Group 3 (Channel);</li> <li>• Evidence of engagement of NWWAC: Document 2. Advice of NWWAC to Commission on a management plan for eastern Channel sole (19 June 2015).</li> <li>• Evidence of engagement of Ifremer and DPMA: Document 3. Ifremer evaluation of management options for eastern Channel sole, following request of DPMA</li> <li>• Evidence of ongoing collaboration between Ifremer and FROM Nord – presentation of project SMAC (improvement of knowledge for better management of sole in the eastern Channel)</li> </ul>

Table A1.2: Condition 2 – VIld sole

Performance Indicator	PI 1.2.2 There are well defined and effective harvest control rules in place
Score	75
Rationale	<p>For VIld sole, the annual TAC is set on the basis of advice from ICES, using the MSY approach given the state of the stock in relation to reference points that are set with the explicit purpose of maintaining a fully reproductive stock and a sustainable fishery. The TAC is adjusted in relation to the ratio of SSB forecast for the next year and <math>MSY_{B_{trigger}}</math>, with a de facto TAC constraint of 20%. This ensures that the exploitation rate is reduced as limit reference points are approached, and SG80a is met.</p> <p>The main uncertainties that affect the HCR have been the levels of underreporting and misreporting between adjacent areas, which have reduced in recent years and are taken into account in the stock assessment process that underpins the setting of the annual TAC. Discards have also been taken into account in the assessment since 2014 and SG80b is met.</p> <p>The TAC has a good track record of maintaining SSB above <math>MSY_{B_{trigger}}</math>, and there are technical measures (minimum landing size of 24cm and complementary mesh size controls for trawls and fixed trammel nets) and effort controls implemented through the cod recovery plan and the sole and plaice long-term management plan in the form of limitations on effort (kW-days) by demersal gears in the North Sea and Eastern Channel which have reduced effort in recent years. However, the harvest control rules (TAC and other) have not so far been successful at bringing the exploitation rate down to the target level (<math>F &gt; F_{MSY}</math>), and SG80b is not met.</p>
Condition	Controls on the exploitation rate should be better aligned with the status of the VIld sole stock, and there need to be define biomass and fishing mortality management targets that are mutually consistent, in order to provide evidence that the tools in use are effective in achieving the exploitation levels required under the harvest control rules (SG80 scoring issue c).
Milestones	<p>Meeting this condition will require implementation of appropriate biomass and fishing mortality management targets and associated HCR for VIld sole, which would form part of the management plan or strategy required for Condition 1. The anticipated milestones are set out below:</p> <p>Year 1: Evidence that the client is working with the French authorities, the AC or other suitable stakeholders to encourage the EU and ICES or the relevant coastal states to develop a clear, mutually compatible targets and an associated HCR. <b>Likely resulting PI Score: 75</b></p> <p>Year 2: Evidence that ICES has reviewed biomass and fishing mortality reference points and targets for VIld sole that will enable controls on the exploitation rate to be aligned with the status of the stock. <b>Likely resulting PI Score: 75</b></p> <p>Year 3: Evidence of that appropriate reference points and targets are embedded in a management plan or other form of management strategy for VIld sole. <b>Likely resulting PI Score: 75</b></p> <p>Year 4: Evidence that the management strategy has been adopted. <b>Likely</b></p>

	<p><b>resulting PI Score: 75</b></p> <p>Year 5: Evidence that the fishery is being managed according to the management plan and is achieving its objectives of maintaining SSB at or above <math>MSYB_{trigger}</math> (currently 8000 t) and fishing mortality has declined to <math>F_{MSY}</math>.</p> <p><b>Likely resulting PI Score: 80</b></p>
Client action plan	<p>Year 1 (2015/2016):</p> <ol style="list-style-type: none"> <li>1. Participation and discussions in the NWWAC on measures to be included in the management plan. FROM Nord is represented by François Hennuyer, managing director. FROM Nord is a key stakeholder for the management of eastern Channel sole, given that their quota allocation for 2015 represents 52% of the TAC and 62% of the French quota. At the request of the CRPM Nord-Pas de Calais, DPMA has requested Ifremer to evaluate management measures for the stock. The response of Ifremer (June 2015) is attached (see Appendix 6 Consultation on Conditions). Additional measures have been propose by the three POs and three CRPM. The full set of management options was presented to the NWWAC working group by François Hennuyer (FROM NORD) and Olivier Leprêtre (president of CRPM Nord-Pas-de-Calais), leading to the advice provided by the NWWAC to the Commission (19 juin 2015 – see Appendix 6 Consultation on Conditions). This advice is the result of Ifremer's proposals, as well as those from the French, Belgian and English fisheries.</li> </ol> <p>(Participation et discussions au sein du Conseil Consultatif pour les Eaux Occidentales Septentrionales (CCEOS) sur les mesures à proposer dans le cadre d'un plan de gestion. Le FROM NORD est représenté par François Hennuyer, directeur délégué. Le FROM NORD est très impliqué dans la gestion de la sole Manche Est dans la mesure où le quota 2015 représente 52% du TAC et 62% du quota national. A la demande du CRPM Nord-Pas-de-Calais, la DPMA a saisi Ifremer sur l'évaluation de mesures de gestion pour le stock de sole Manche Est. Une réponse de l'Ifremer a été rédigée en juin 2015 (Cf pièce jointe). Cette réponse a été complétée par des mesures supplémentaires émanant des professionnels des trois Organisations de producteurs et des trois CRPM. L'ensemble a été présenté au groupe de travail du CCEOS par François Hennuyer, directeur délégué du FROM NORD et Olivier Leprêtre président du CRPM Nord-Pas-de-Calais (avis du 19 juin 2015).)</p> <ol style="list-style-type: none"> <li>2. Presentation of advice to and discussions with STECF</li> </ol> <p>(Présentation d'un avis et discussions avec le Comité Scientifique, Technique et Economique de la Pêche (CSTEP).)</p> <ol style="list-style-type: none"> <li>3. Participation in project SMAC (improving information for better management of the stock – eastern Channel sole). This project is being implemented by Ifremer. FROM Nord is represented by François Hennuyer and along with CRPM Nord-Pas de Calais has participated very actively in the project working group, in defining the main research priorities for the stock (see Appendix 6 Consultation on Conditions). The project will start in December 2015 and is foreseen to last 3 years. The English industry is working on the development of a similar research project with their administration.</li> </ol> <p>(Participation au projet <b>Sole de Manche Est – Amélioration des Connaissances pour une meilleure gestion du stock (SMAC)</b>)</p>

	<p>Ce projet est porté par Ifremer. Le FROM NORD représenté par François Hennuyer, directeur délégué et le CRPM Nord-Pas-de-Calais ont participé de manière très active au sein du groupe de travail dans l'élaboration des différents axes de recherche du projet. (cf pièce jointe)</p> <p>Début du projet en décembre 2015 pour une durée prévue de 3 ans</p> <p>Les professionnels anglais ont pris l'engagement de demander à leur administration la mise en place d'une étude similaire.)</p> <p>4. All decisions from the EU will be implemented. (Préparation et mise en place des décisions du Conseil de fin d'année). Year 2 (2016/2017): Provide evidence that the strategy or management plan is being developed. (Apporter la preuve que la stratégie ou plan de gestion est en cours de développement.)</p> <p>Year 3 (2017/2018): Provide evidence that the strategy or management plan is being evaluated by the relevant stakeholders. (Apporter la preuve que la stratégie ou plan de gestion est en cours d'évaluation par les différentes parties prenantes.)</p> <p>Year 4 (2018/2019) : Provide evidence that the strategy or management plan has been adopted by the relevant stakeholders. (Apporter la preuve que la stratégie ou plan de gestion a été adoptée par les différentes parties prenantes.)</p> <p>Year 5 (2019/2020) : Provide evidence that the management of the fishery conforms to the management plan and that it is likely to achieve its objectives. (Apporter la preuve que la gestion de la pêche est conforme au plan de gestion et que la stratégie de gestion achève ou va probablement les objectifs.)</p>
<p>Consultation on condition – see Appendix 6 Consultation on Conditions</p>	<ul style="list-style-type: none"> <li>• Evidence of engagement of CRPM Nord-Pas de Calais, other CRPM and POs in France, and UK and Belgian industries: Document 1. Participation list for NWWAC Working Group 3 (Channel).</li> <li>• Evidence of engagement of NWWAC: Document 2. Advice of NWWAC to Commission on a management plan for eastern Channel sole (19 June 2015).</li> <li>• Evidence of engagement of Ifremer and DPMA: Document 3. Ifremer evaluation of management options for eastern Channel sole, following request of DPMA.</li> <li>• Evidence of ongoing collaboration between Ifremer and FROM Nord – presentation of project SMAC (improvement of knowledge for better management of sole in the eastern Channel).</li> </ul>

## Appendix 2 Peer Review Reports

### Appendix 2.1 Peer review 1

#### Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes, in the main	Conformity Response	Assessment	Body
<u>Justification:</u>  The report is very well written and covers most elements comprehensively.  As detailed in the comments, below, I have queried a number of the scores where more information would help justify the existing scores. There are also several places where I think the scores are too high, and a couple where the scores could be increased.				Thankyou.  See response to detailed comments

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes for the conditions raised	Conformity Response	Assessment	Body
<u>Justification:</u>  For the conditions raised, the text is appropriate.  As detailed below, there are a number of places where I think additional conditions should be raised (e.g., PI 3.2.4)				See response to specific comments below

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Conformity Response	Assessment	Body
<u>Justification:</u>  No further comments.				None

### General Comments on the Assessment Report (optional)

1. I have commented and queried on a number of points, but this is nevertheless one of the best written reports I've come across – well done to the team.

#### Thanks

2. Section 3.2.3: *"Both gill nets and trammel nets are set before dark, generally parallel to the tide."* I presume the reference to gill nets could be deleted as the UoC does not include them?

#### **This has been amended in the text.**

3. Section 3.2.4: My expectations were raised when the report stated *"The fishing activity of FROM Nord member vessels targeting sole with trammel nets is mapped in detail in Figure 2."* However, the figure shows only landings by vessels in the UoCs at the level of ICES rectangles, which is quite a coarse measure. Figure 3 could be described more fairly as 'detailed'.

#### **Point taken. Noted and edited accordingly.**

4. Section 3.2.4: *"If, however, the vessel does fish occasionally in Vlle, it will be in separate trips (since trips are short: ~12 hours) and will be easy to separate at auction (see section 0)."* Section 5.2 then states: *"In the unlikely event that the trip take place in both certified and non-certified areas, then the whole catch from that trip (Vlld and Vlle for example), would not be eligible to be bear the MSC ecolabel and enter into further chains of custody"*. How would the risk of fish from a mixed (i.e., UoC area and non-UoC area ) trip entering the COC be managed?

**As stated, the fishing in Vlle is seen as a clerical error. That said the two sentecence highlighted do suggest a contrasting policy being put forward for mixed catches. MEC has deleted the first sentence as it is the one in the Traceability section that is correct (i.e. If a vessel was to fish in MSC and non-MS C waters, then the whole catch would be non-certifiable).**

5. With respect to Section 5, given that FROM Nord members operate trawl vessels also (landing 300-400 t, according to Section 3.2.5, it would be worth highlighting how any risk of transshipping (contrary to regulations) from that fleet will be managed.

**FROM Nord is a large PO which includes as members a wide variety of vessels taking part in different fisheries all around France. In France as elsewhere in Europe, just because these vessels are members of the same PO does not mean that they are likely to operate together. The Boulogne-registered trawlers which belong to FROM Nord are part of complete different fleets and fisheries – i.e. pelagic trawlers participating in the herring fishery, and large offshore whitefish trawlers targeting mainly saithe in the northern North Sea and points north. Incidentally, both these fisheries are MSC certified. It is no more likely that there is transshipment between these vessels and vessels in this UoC than with any other vessels. In relation to the risk of transshipment in general, it is covered in the general analysis of at-sea enforcement in PI 3.2.3.**

6. Section 3.3.4.3: *"...in cases such as this, where recruitment on the SR plot appears to increase with decreasing biomass, and hence there appears to be no danger of recruitment failure at*

*biomass levels around  $B_{loss}$ , they used  $B_{loss}$  as a proxy for  $B_{pa}$* . ‘No danger’ seems to underestimate the actual danger of recruitment failure, given that the statement is based solely on a relatively small number of observations.

**This has been amended.**

7. With respect to small-spotted catshark, Section 3.4.3.4 states: “*studies show that post-discard survival rates are high.*” I agree this is very likely, but a reference to support the statement would be a useful addition.

**This has been added.**

8. Section 3.4.5.3 states “*The programme aimed at 10% observer coverage aboard the concerned fleets*”. Table 11 indicates that the fleet under assessment has not met the 10% target (average = 0.5% for 2011 – 2013). This is understandable given the likely difficulty of carrying out observer work aboard these relatively small vessels, but a comment on the limited usefulness of the actual observer data to detect rare events seems appropriate.

**The point is made in the rationale for 2.3.3 – we have tried to keep the main text of the report to an explanation of the facts, and save the judgements for the rationales and scoring.**

## Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

### Eastern Channel P1

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	N/A		
1.1.2	Yes	Yes	N/A		
1.1.3	Not scored	Not scored	N/A		
1.2.1	Yes	No with respect to SId, otherwise Yes.	N/A	It is not clear that SId is met (only scored at SG100 - " <i>The harvest strategy is periodically reviewed and improved as necessary</i> "). Although the harvest strategy may be reviewed, the continuing high F indicates that it has not been improved 'as necessary'. The text indicates that measures have been proposed to address this issue, but not implemented, which I think precludes a 100 score.	The team agrees that, though France introduced its own management plan from 2015, thusimproving management of the fishery that takes the majority of the catch, measures to achieve a reduction in F have not yet been shown to be successful and SId is therefore not met. The text has been amended accordingly.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.2	Yes	No with respect to Sla, otherwise Yes.	N/A	<p>Section 3.3.4.4 states: "For the past two years (2014 and 2015), the TAC has been set by the EU higher than the ICES advice – this also happened in 2009 and 2010 (Table 8). <b>It appears (Table 8) that in setting the TAC, the EU Fisheries Council have been following a 20% inter-annual TAC constraint, although this is not formalised anywhere</b> – with the exception of 2015 when they reduced the TAC by 28% relative to 2014, although this is still a considerably smaller reduction than the 60% reduction required to fish the stock at FMSY in 2016."</p> <p>Essentially, this text describes the SG60 requirements ("generally understood") for Sla, not the SG80 requirements ("well defined").</p>	The question is – is 'well-defined' necessarily synonymous with being formally written down somewhere? The experience (and MSC scoring) of many small-scale artisanal fisheries suggests not, necessarily. The de facto rule can easily be determined by the decisions made, as done by the team, and does not differ from the HCR for many (probably most) EU fisheries – i.e. the TAC is set following ICES advice (which follows a clear EU-defined framework based on the MSY approach given the state of the stock in relation to reference points that are set with the explicit purpose of maintaining a fully reproductive stock and a sustainable fishery on that stock ) with some constraints in place to avoid very large interannual changes. This seems reasonably well-defined to the team, despite the lack of a formal management plan.
1.2.3	Yes	Yes	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.4	Yes	Yes	N/A		

#### North Sea P1

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.2	Yes	No with respect to Slb, otherwise Yes	N/A	<p>The SG100 requirement is that "The LRP is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues." It is indicated (through stating 'Yes' that the fishery meets this requirement.</p> <p>The scoring text states: "In relation to SG100, the team considered that this estimate of Blim is precautionary, since the stock has recovered from below this level in the past, and since there is not much evidence for any kind of SR relationship."</p> <p>This text does not justify a 100 score for Slb because precautionary issues have been 'considered' – it is only that the stock has recovered from this point in the past. However, overall, it is indicated that the PI scores 80, which does seem appropriate.</p>	The team considered that this estimate of Blim is precautionary not just because the stock has recovered from below this level in the past, but also because there is little evidence for any kind of SR relationship, high biomass values have resulted in some of the highest and some of the lowest year classes in the time series, and ICES revised Blim from 25,000 t to 26,300 t at the 2015 benchmark following the "precautionary approach".
1.1.3	Not scored	Not scored	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	Yes	Yes	N/A		
1.2.2	Yes	Yes	N/A		
1.2.3	Yes	Yes	N/A		
1.2.4	Yes	Yes	N/A		

## Both UoCs, Principles 2 and 3

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	Yes	N/A		
2.1.2	Yes	Yes	N/A		
2.1.3	Yes	Yes	N/A		
2.2.1	Yes	Yes	N/A		
2.2.2	Yes	Yes	N/A		
2.2.3	Yes	Yes	N/A		
2.3.1	Yes	Yes	N/A		
2.3.2	Yes	No	N/A	<p>The report notes that the fishery does not comply with the EU Regulation requiring that fishers in Area VII fit pingers to static nets.</p> <p>Although the report makes an argument as to why complying is not necessary (even though the data indicate that there is some</p>	<p>The situation in relation to this regulation was clarified with the client and with the CRPM Nord-Pas de Calais (Delphine Roncin).</p> <p>It is the case that, technically speaking, the fishery finds itself in non-compliance with the regulation, which requires all nets set in</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>interaction with cetaceans, albeit at an unknown level because the observer coverage is very low) and/or difficult (fair enough, although the requirement remains a requirement), and notes that a derogation request has been submitted.</p> <p>However, a decision on the derogation has yet to be made, and in the absence of that decision it is apparent that the fishery does not have a strategy which achieves “<b><i>national and international requirements</i></b> for the <i>protection of ETP species.</i>”</p> <p>it seems that a condition is required. If the derogation is accepted subsequently, then, fine – the condition can be removed. However, if it isn't then the fishery would remain not in compliance with international requirements.</p>	<p>Division VIId to have pingers.</p> <p>France has presented (and continues to present) all observer data to the Commission – so far, out of more than 1000 observations in the Channel, there has been not a single instance of porpoises entangled in nets in VIId, and a test with pingers resulted in incidental capture of seals which had never previously happened ((Ifremer – synthèse des résultats de programme FilManCet). Ifremer also expressed concern that the habitat quality for cetaceans would be degraded by the widespread presence of pingers, although they present no evidence for this. On this basis, it seems clear that the regulatory requirement to put pingers on the nets makes no sense for the fishery.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					<p>None of the team are lawyers, so we feel a little unqualified to comment on the legal situation of this fishery in regard to this regulation – in practical terms, however, there appears to be a consensus between France and the Commission that there is no reason to enforce this regulation in this fishery.</p> <p>Finally, the team noted that the regulation is in the process of revision, as part of the review of technical measures in EU fisheries currently underway. The FilManCet and observer data have formed part of the submissions to that review process.</p> <p>Overall, therefore, the team took the view that the requirement for pingers is no longer part of the de facto international requirements on this fishery.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	No	N/A	<p>At the SG80 level, SIa requires a quantitative estimate of fishery-related mortality, and SIc requires that information is sufficient to measure trends.</p> <p>Although there is a justification as to why the &lt;1% (the actual average is 0.5% for 2011-2013, according to the data) observer coverage is sufficient to meet the SG80 level of performance, it is not clear that is possible when only 1 in 200 trips is observed.</p> <p>Specifically, are the observed vessels selected randomly or do observers go aboard only a small number of specific vessels? Do the trips occur throughout the year, across the fishery area, and at times when there may be likely to be more cetaceans in the fishery area? How representative, therefore, are the ETP bycatch data likely to be for the fishery as a whole?</p>	<p>All these are excellent questions. To present the data from 2014, trips were observed from 15 out of 44 ports from which the fleet operates, and covered ports all along the coast from Dunkerque to St Vaast. The most important port (Boulogne) covered 45% of observer trips vs. 37% of overall trips, i.e. it was a little over-represented, but not much. Observers covered vessels of a range of sizes in each port (e.g. to take the four most important: Boulogne: 4-17m, Dunkerque 7-18m, Calais 11-15m, Dieppe 8-17m). Overall, Ifremer observed at least one trip on 29% of the fleet (50 vessels out of 175). With 119 trips in total, this means that each sampled vessel has on average just over two trips.</p> <p>In other words, it seems that Ifremer have made a significant effort to make the data as representative of the whole fleet as possible, including geographic area, vessel size and vessel identity.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.1	No	Yes for the given score	N/A	<p>Although there are no direct studies of this fishery, if the team is confident that the fishery occurs on sandy/sandy mud areas, then I would expect there to be evidence in studies globally that shows <i>"the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm."</i></p> <p>Essentially, I think the fishery should score higher here – I would not argue with a 100 score.</p>	<p>This is a difficult PI to score, and the scoring has been very inconsistent in different fisheries over the years. Some accept general global evidence as to impacts of different gears in different environments, while others have required evidence for that particular gear in that particular environment. Then there is the question of where the line is drawn between change and 'serious or irreversible harm'.</p> <p>The Danish sole set net fishery scored 90 for this PI (but without any indication of which bits of SG100 are met vs not met), while Hastings and the CVO plaice fishery both scored 80. For the sake of consistency, the team decided to keep the score at 80 (but the point is taken).</p>
2.4.2	Yes	Yes	N/A		
2.4.3	Yes	Yes	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.1	No	Yes for the given score	N/A	<p>Similar to the comment on PI 2.4.1, I think the fishery could score higher, here. Specifically, in Section 3.5.2.4 the report notes "<i>Ecosystem models of the Eastern Channel and of the North Sea ecosystems exists (Ajaulo et al 2008, Mackinson and Daskalov 2008) and are used to evaluate fisheries impacts.</i>"</p> <p>Given the information presented already on the scale and size of the fishery, the quantities of catch and discards, etc, if the ecosystem modelling work was included then I would not be surprised if a higher score could be justified.</p>	A comparison of other scores for this PI (as above) – 80, 90, 95 – suggest that the team may have been a harsh here. The scoring for this PI was reviewed, information about ecosystem modelling added and the score increased to 90.
2.5.2	Yes	Yes	N/A		
2.5.3	Yes	Yes	N/A		
3.1.1	Yes	Yes	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.2	Yes	No with respect to SIc, otherwise yes	N/A	<p>Although not mentioned in the scoring text for SIc, there is opportunity for environmental stakeholders to participate in fisheries management at the regional level through the Advisory Councils.</p> <p>However, it is not clear that consultation process provides opportunity for all interested and affected parties to be involved at the local level. For example, in England, Ministerial appointments that are made to the IFCA include representatives of environmental NGOs. Is the same or a similar opportunity offered for environmental groups to participate in the management discussions around the FROM Nord fishery – I cannot see evidence that this is the case, and if not then the SI needs to be scored lower, possibly at the SG60 level if there is no opportunity provided for eNGO stakeholders.</p>	<p>Some text added to clarify NGOs opportunities to participate at AC level has been added to section 3.5.1.2 Consultation, roles and responsibilities.</p> <p>The French system differs from the English system in that there is a local co-management system between industry and government, through which the industry bodies (CRPM, POs) work with scientists on joint projects to collect information and devise impact reduction strategies.</p> <p>For the fishery-specific decision making processes, text modified in section 3.5.2.2.</p> <p>Text added to scoring table, and mistake in scoring table for SGa 100 Y corrected with N, thank you.</p>
3.1.3	Yes	Yes	N/A		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.4	Yes	Yes	N/A		
3.2.1	Yes	Yes	N/A		
3.2.2	Yes	Yes	N/A		
3.2.3	N	N	N/A	The report mentions elsewhere that fishermen do not comply with the EU Regulation to use pingers on their nets. Although a derogation request has been submitted, there has been no decision on that. At present, this would seem to be a clear cut example of systematic non-compliance, and it is not clear how the fishery achieves the SG80 level of performance for SIs b, c or d.	As noted above (see response to comment on PI 2.3.2) the team concluded that the de facto situation is that this is not a requirement on this fishery, the requirements of Regulation 812/2004 having been met, in practice, by the data provided by Ifremer to demonstrate that the rate of interactions is very low (none observed to date) and pingers are more likely to be harmful than beneficial. It seems to us a good feature of the system rather than the reverse, that it is able to set aside the enforcement of a regulation which has been clearly demonstrated to be counter-productive.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	N	N	N/A	<p>Under the MSC CR v.1.3, the requirement under CB4.10.3 is that "Teams shall interpret a "research plan" in both SG80 and SG100 to mean a written document that includes a specific research plan for the fishery under assessment, relevant to the scale and intensity and the issues requiring research."</p> <p>The report states "There is no document labelled 'research plan' for the Eastern Channel sole fishery or for the North Sea sole fishery".</p> <p>It is apparent that the fishery does not meet the SG80 requirement for SIa, frustrating (and irrelevant under CR v.2.0) as that may be.</p>	<p>The quote given notwithstanding, in relation to fisheries managed by ICES, the interpretation of this PI has always been that the planning and terms of reference for ICES working groups constitutes a 'research plan' for the fishery, regardless of whether it is brought together in a single document or not. To interpret it otherwise results in nonsense, as the reviewer suggests. The team noted that the scores for the other fisheries (as quoted above) for this PI were 85, 90 and 95, so scoring this PI at the 60 level would also not be consistent with harmonisation. In the view of the team (although this has not been done by MEC here), a wider analysis of scoring of this PI for ICES fisheries would show the same approach across all fisheries and CABs.</p>
3.2.5	Yes	Yes	N/A		

Any Other Comments

Comments	Conformity Assessment Body Response
I have provided the team with a copy of the assessment report with suggestions for a small number of typos/edits.	Much appreciated

## Appendix 2.2 Peer review 2

### Overall Opinion

<b>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</b>	<b>Yes</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<b>Justification:</b> I conclude the team has arrived at the appropriate conclusion but some of the scoring justifications need to be clarified.				

<b>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</b>	<b>Yes</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<b>Justification:</b> Conditions are justified considering the state of the Eastern Channel stock. Condition 1 PI 1.2.1 - At year 5, it is required that SSB should be at or above MSYBtrigger (currently 8000 t) and fishing mortality at or below FMSY, I think this should be clearly stated in the condition, instead or in complement of the general "achieving objectives". This can be the same for condition 2 PI 1.2.2 (which is linked to the previous one).				We take your point, but MSC guidance on condition setting states that the condition should basically restate the wording of the relevant SG80 guidepost, which refers to 'objectives' rather than MSYBtrigger and FMSY specifically. Note that the milestones are auditable, so including it in the milestones has the same effect.

If included:

<b>Do you think the client action plan is sufficient to close the conditions raised?</b>	<b>Yes</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<b>Justification:</b> A large part of the proposed action plan makes reference to a research plan, which is not the main issue here. However, this action plan is likely to work, considering the strong implication of FROM-Nord, which is very proactive, in the process. It seems also that a strong commitment exists from all the parties (ICES, administration and POs) to bring the stock to the precautionary level. The action plan should achieve the objectives in the time frame.				As long as it is sufficient to meet the conditions in the timeframe, that's all that matters.

For reports using the Risk-Based Framework please follow [the link](#).

For reports assessing enhanced fisheries please follow [the link](#).

### General Comments on the Assessment Report (optional)

None provided

## Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
PRINCIPLE 1 - EASTERN CHANNEL STOCK (VIIId)					
1.1.1	Yes	No	N/A	<p>I'm not convinced that "There is a high degree of certainty that the stock is above the point where recruitment would be impaired".</p> <p>I agree that, for the time being, SSB remains above <math>B_{pa}</math>, but, as mentioned, SSB is predicted to decline over the medium term, which means below <math>B_{pa}</math>. Recruitment is considered to be the lowest of the time series and declining. Therefore, the future of this stock is uncertain, especially if F is not reduced.</p> <p>It's difficult to accept that the score is the same as for the North Sea stock, for which the picture is more positive.</p>	<p>ICES has defined <math>B_{pa}</math> (the precautionary level of SSB that will ensure with a high probability that the stock remains above the level below which recruitment could be impaired) as the lowest SSB level observed in the assessment time series (8000 t), since there is a low spread of values within the S/R time series and recruitment tends to increase with decreasing biomass. Hence, there appears to be no danger of recruitment failure at biomass levels around <math>B_{pa}</math>, and all catch forecast scenarios in the 2015 ICES advice indicate SSB in 2017 to be well above <math>B_{pa}</math> (a catch of 4 kt <math>\rightarrow</math> SSB of 8800 t. The scoring comments have been amended to clarify this.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.2	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue.	
1.1.3	N/A	N/A	N/A		
1.2.1	Yes	Yes	Yes	There is no formal management plan for this stock and fishing mortality is above the precautionary target. A score below 80 is logical. The definition and implementation of a management plan leading to a clear harvest strategy is likely to reduce exploitation level and would respond to SG80b	
1.2.2	Yes	Yes	Yes	This PI is linked to the previous one and the comment would be the same.	
1.2.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue.	
1.2.4	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue.	
PRINCIPLE 1 - NORTH SEA STOCK (IV)					

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
1.1.2	Yes	Yes	N/A	As SG100b is met, the score should be 90 (not 80).	
1.1.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
1.2.1	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
1.2.2	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
1.2.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
1.2.4	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
PRINCIPLE 2					

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	Yes	N/A	While I agree with the global score, the fact that the edible crab survives well after discard (SG60d) cannot be considered as part of a strategy, even if it has positive effect to reduce the impact of fishing.	MSC have a fairly wide definition of what can constitute a 'strategy' – fisheries management can take account of discard survival in evaluating, for example, whether discarding should be allowed, whether effort should be put into making gear more selective, and so on.
2.1.2	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
2.1.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
2.2.1	Yes	Yes	N/A	A score of 80 is met by default	
2.2.2	Yes	Yes	N/A	A score of 80 is met by default	
2.2.3	Yes	Yes	N/A	A score of 80 is met by default	
2.3.1	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
2.3.2	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	No	N/A	The observer coverage is low. I don't think that 283 observed trips over three years can be qualified as "considerable", while less than 1% of days at sea are observed. The information seems to be fragmentary and I'm not sure that the impact of fishing can be quantitatively estimated (SG80a). The argumentation should be more convincing.	Point taken – the wording has been changed. Nevertheless, it may be a bit harsh to categorise it as 'fragmentary' – there has been a consistent observer programme over three years which has made considerable effort to cover a representative sample of the fleet (see information given in response to Peer Reviewer 1).  It is a perennial problem to quantify the rate of rare events, but following the logic of this argument would mean that more observer effort would be allocated to fisheries with fewer interactions. The team considered that the observer data available was sufficient to demonstrate that interactions with ETP species were rare enough to ensure that the fishery was not posing a problem to maintaining or recovering these populations, which is the essential question.
2.4.1	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.2	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
2.4.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
2.5.1	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
2.5.2	Yes	Yes	N/A	Most of the argument is based on policies that should be applied in the future, with no guarantee of results, while SG80a requires that the partial strategy is in place. However, as retained species have their own management plan, and as the impact on the ecosystem is minimal, the score of 80 is justified.	
2.5.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
PRINCIPLE 3					
3.1.1	Yes	Yes	N/A	SGd100 is not met, the score cannot be 100.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.2	No	No	N/A	Guide post c refers to all affected and interested parties. Parties actually involved in the process appear to be solely industry representative and administration. It is unclear if other parties, such as NGOs, have the opportunity to participate. This should be clarified.	Some text added to clarify NGOs opportunities to participate has been added to sections 3.5.1.2 Consultation, roles and responsibilities and the fishery-specific decision making processes in 3.5.2.2, and to scoring table
3.1.3	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
3.1.4	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
3.2.1	Yes	Yes	N/A	The score is supported by the evidence for each scoring	
3.2.2	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
3.2.3	Yes	Yes	N/A	According to the text, SGa100 is not met: a "Y" should not be in the table. The global score is correct.	Done, thank you

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	
3.2.5	Yes	Yes	N/A	The score is supported by the evidence for each scoring issue	

### Any Other Comments

Comments	Conformity Assessment Body Response
None provided	None

## Appendix 3 Stakeholder submissions

Prior to publication of the PCDR no stakeholder comments were received, other than those for the general purpose of providing information for the assessment. Following the site visit, there was an ongoing dialogue with the Comité Regional des Pêches Maritimes de Basse Normandie (CRPM-BN) which has been formalised as a stakeholder submission regarding the PCDR (generated by MEC and approved by CRPM-BN). This is further detailed below. The only other comments received are those submitted by the MSC following publication of the PCDR.

### Appendix 3.1 CRPM-BN comments

Les fileyeurs de Haute-Normandie pratiquent une partie de leur activité dans un secteur de pêche situé en Baie de Seine dans le ressort territorial du CRPM de Basse-Normandie. Ils ont toujours contesté la licence mise en place en Basse-Normandie et pratiquent ce secteur sans licence spéciale, en refusant d'appliquer la règle de maillage à 100 mm qui prévaut pour leurs collègues bas-normands. Des conflits récurrents de cohabitation n'ont pas été résolus.

Dans le contexte délicat de l'évolution du stock de soles en VII D et des réductions de TAC et quotas européens, la France à partir de janvier 2015 a pris des mesures d'encadrement de la pêche en instaurant une autorisation nationale « ANP » très contraignante. La recherche de mesures communes pour l'élaboration d'un plan de gestion de la sole en Manche Est n'a pas encore abouti. On peut également s'interroger sur la définition des zones de nurseries à protéger.

Je répète que nous ne voulons pas nous opposer ... mais simplement faire quelques remarques.

Voici en somme les principales récriminations de CRPM-BN :

1. Vu l'absence de recrutement depuis 3 années consécutives, le CRPM-BN a mis en place ou proposer pour 2016 plusieurs mesures de gestion qui ne sont pas en place dans la zone Nord:

- Un maillage des filets de 100 mm est en place en BN, mais pour le Nord le maillage est 90 mm (sous dérogation); les bateaux nord qui exploitent la zone BN refusent le maillage de 100 mm
- Une proposition d'augmentation de taille minimale de 26 cm BN n'a pas été validée; la taille minimum est de seulement 25 cm dans la zone Nord

2. Le plan de gestion français protège plusieurs zones de nourriceries – mais les zones sont définies à minima dans la zone Nord, par rapport aux grandes zones fermées dans la zone BN.

3. Les problèmes de cohabitation entre les bateaux Nord et BN dans notre zone, ou les bateaux du Nord ne respectent pas notre licence

4. CRPM-BN devrait être considéré comme partie prenante:

- Les fileyeurs de la région Nord exploitent la Manche Est sur les zones de BN

- Deux navires de BN sont membres du FROM Nord et pêche en les zones de BN aussi

Aussi deux commentaires fait directement dans le rapport PCDR:

- p24 'Comité Régional de Pêche' : noté que ' LE CRPM Basse Normandie anime également une commission filets et délivre des licences'
- p76 'Site visits and consultations' Tableau 22: noté que ' meeting in Jersey about "Jersey and Normandy Lobster" MSC 4th year audit and reassessment- 2 .5 days on Lobster ... not sole !'

### Translation by MEC :

*The Haute Normandie gillnet fishermen carry out part of their operations in a fishing area located in the Baie de Seine within the jurisdiction of the CRPM-BN. They have always challenged the license in force in Basse Normandie and carry out their operations in this area without a special license, and thus refuse to apply the 100mm mesh size limit which their Basse Normandie colleagues do apply. Recurrent cohabitation conflicts have not been resolved.*

*In the delicate context of the evolution of the sole stock in Division VIId and reductions in the TAC and European quotas, France has put in place a national management plan "ANP" which is very binding and entered into force from January 2015. The search for common measures for the development of an Eastern Channel sole management plan has not yet been completed. One can also question how sole nursery areas are being designated for protection.*

*Again, we do not want to oppose this assessment ... but just make a few remarks.*

*Here in summary are the main issues that we would like to raise:*

*1. Given the lack of recruitment for 3 consecutive years, the CRPM-BN has put in place or proposed for 2016 various management measures which are not in place in the zone 'Nord':*

- *A mesh size limit of 100 mm is required in BN, but in Nord the minimum mesh size is 90 mm (via a derogation); the Nord vessels fishing in the BN zone refuse to use 100 mm mesh nets*
- *CRPM-BN have proposed to increase the minimum size to 26 cm, but this has not been accepted; the minimum size is only 25 cm in Nord*

*2. The French management plan protects several nursery areas from fishing – but these zones have been defined to the minimum possible in Nord, in contrast to the large closed areas which have been put in place in the BN zone.*

*3. There are problems of 'cohabitation' between vessels from Nord and from BN in our zone, because the Nord vessels do not respect our licence requirements.*

*4. CRMP-BN should have been considered as a stakeholder:*

- *Netters from Nord fishing in the ICES zone 'eastern Channel' use BN waters*
- *Two BN vessels are members of FROM Nord and also fishing in BN waters*

*Also two comments made directly into the PCDR:*

- p24 'Comité Régional de Pêche' : noted that the CRPM-BN also has a 'Commission Filets' (netting commission) and gives out licences
- p76 'Site visits and consultations' Table 22: noted that ' meeting in Jersey about "Jersey and Normandy Lobster" MSC 4th year audit and reassessment- 2 .5 days on Lobster ... not sole !'

## MEC response :

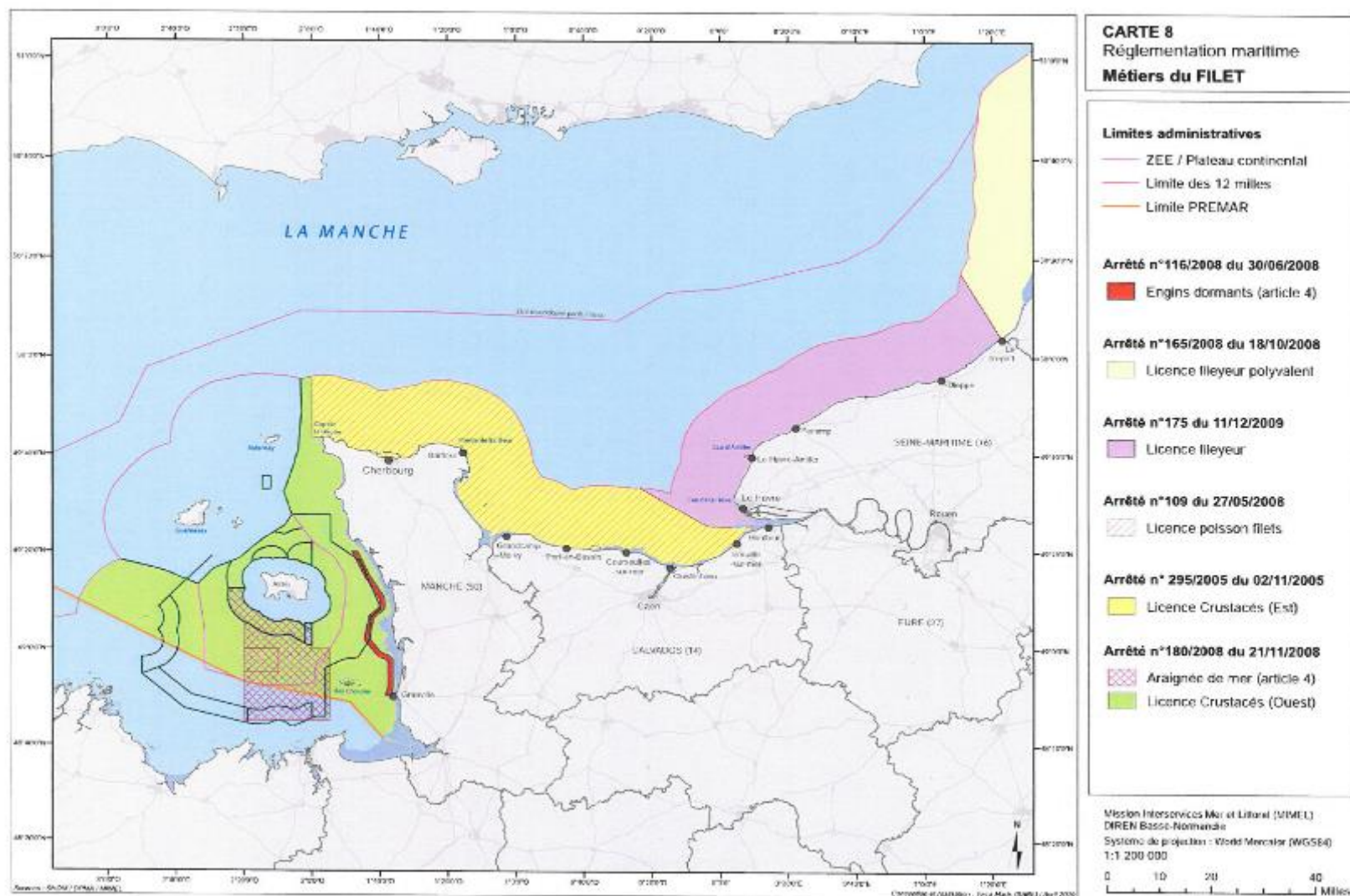
### 1. Licences and mesh size

FROM-Nord provided the map in Figure A below which clarifies the licence requirements for netters in the eastern Channel. The CRPM-managed 12 miles zone for Basse Normandie (BN) in the eastern Channel is shown in yellow / hatched (licence poissons filets and licence crustacés). The Baie de Seine is shared between Haute Normandie (HN; pink) and BN. It is not straightforward with the data available to apportion the catch between the BN and HN zones, because ICES rectangles 28E9, 27E9 and 27F0 in the Baie de Seine straddle the boundary between BN and HN (Figure B).

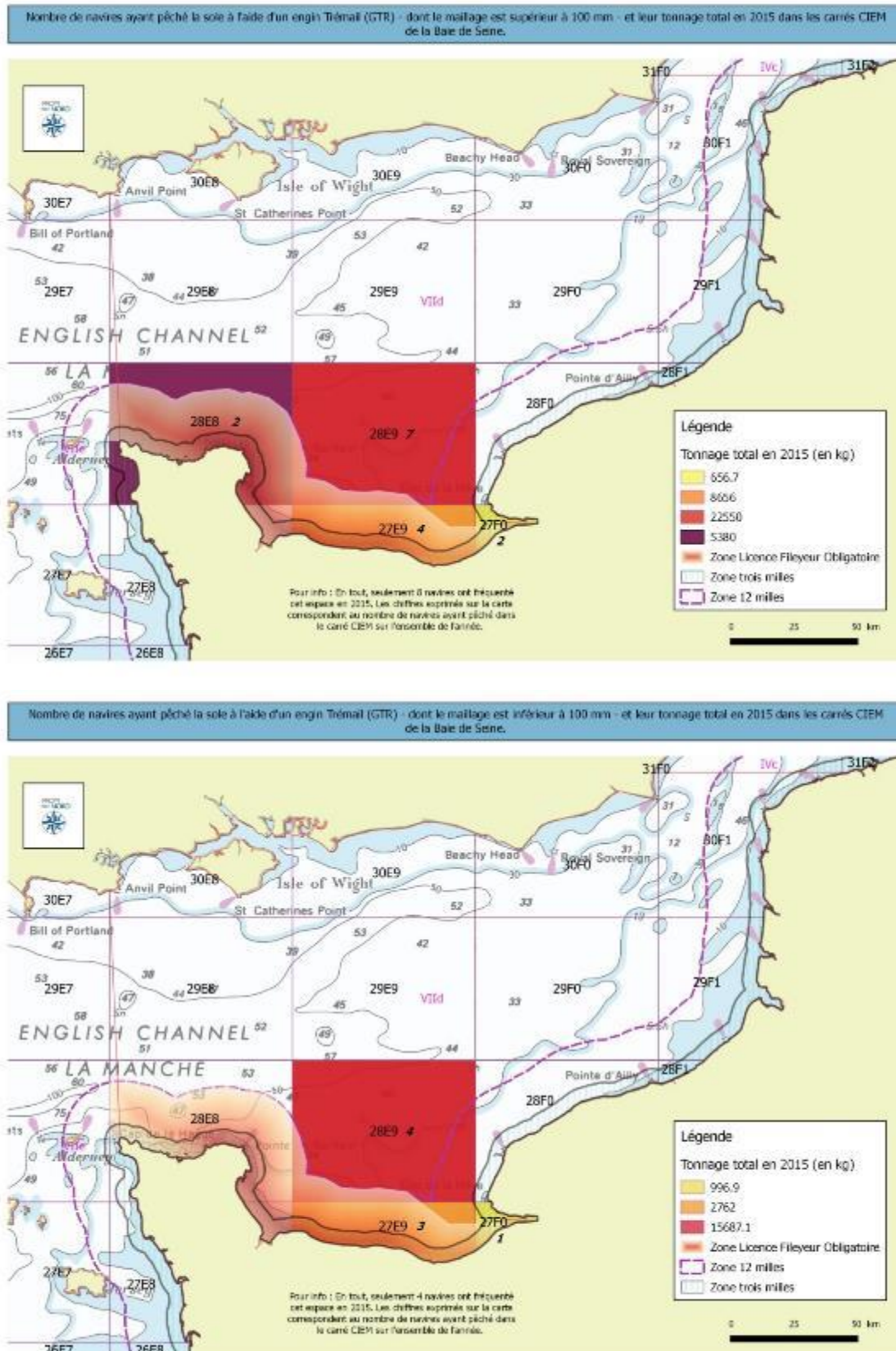
This assessment obviously concerns only vessels that are FROM Nord members. In total, 9 FROM Nord vessels fished in the Baie de Seine using filet trémail, of which two (registered in Cherbourg, see Table 3) have a BN licence (the Marine Camille and the Solitaire I); the others do not. A total of 56 700 t of sole was fished in the Baie de Seine in 2015, of which 46% was taken by the two vessels with BN licences. In terms of mesh size, 66% of the 56 700 t of sole from the Baie de Seine (2015) was taken with a mesh size of 100 mm or more (Figure B – top) and 34% with a smaller mesh size (Figure B – bottom). In other words, it is correct to say that there is fishing in the Baie de Seine with both HN and BN licences, and with both mesh sizes.

Clearly, when fishing in BN waters, HN vessels have to comply with BN rules, in particular use 100mm mesh nets. Recently, there appears to have been delays in the administrative licensing process from the BN side (for reasons unknown to MEC), resulting in HN vessels fishing in BN waters without a licence. The compliance competent authority, the DIRM MEMN, has been acting as a mediator between the two CRPMs, and until the various issues (raised above by CRPM-BN) are resolved, does not consider the temporary lack of BN licence for HN vessels as an infringement. The number of vessels concerned and quantities caught are small and, from DIRM's point of view, catches and areas are reported and no instances of non-compliance with BN rules by HN vessels fishing in BN waters have been detected. Therefore, there are no concerns about the effect of this local disagreement on the stock status, or the ecosystem, which are dealt with under Principles 1 and 2. In any case, the current lack of agreement between the two CRPMs will be resolved as they merge into one in 2017 and agree the terms of a common CRPM "Normandie" netter licence.

Nevertheless, a recommendation has been issued for FROM Nord members to do all in their power for common licensing conditions to be agreed as soon as possible.



**Figure A:** Map of licence requirements in the Nord, Haute Normandie and Basse Normandie areas



**Figure B:** Landings by FROM Nord netters in the Baie de Seine: Top – those using a mesh size of 100mm or more; Bottom – mesh size less than 100 mm.

## 2. Designation of nursery areas for protection

The location and relative contribution of nursery areas to the eastern Channel stock was evaluated by the joint anglo-french (Ifremer/Cefas) research project CHARM (Figure C). The contribution from the north and south coasts of the Channel is approximately equal. On the french side, four main nursery areas have been identified: Boulogne (~25% of the French contribution), Baie de Somme (~40%), Baie de Seine (~15%) and Veys (BN; ~20%).

The closed areas under the French management plan are given in Figure D.

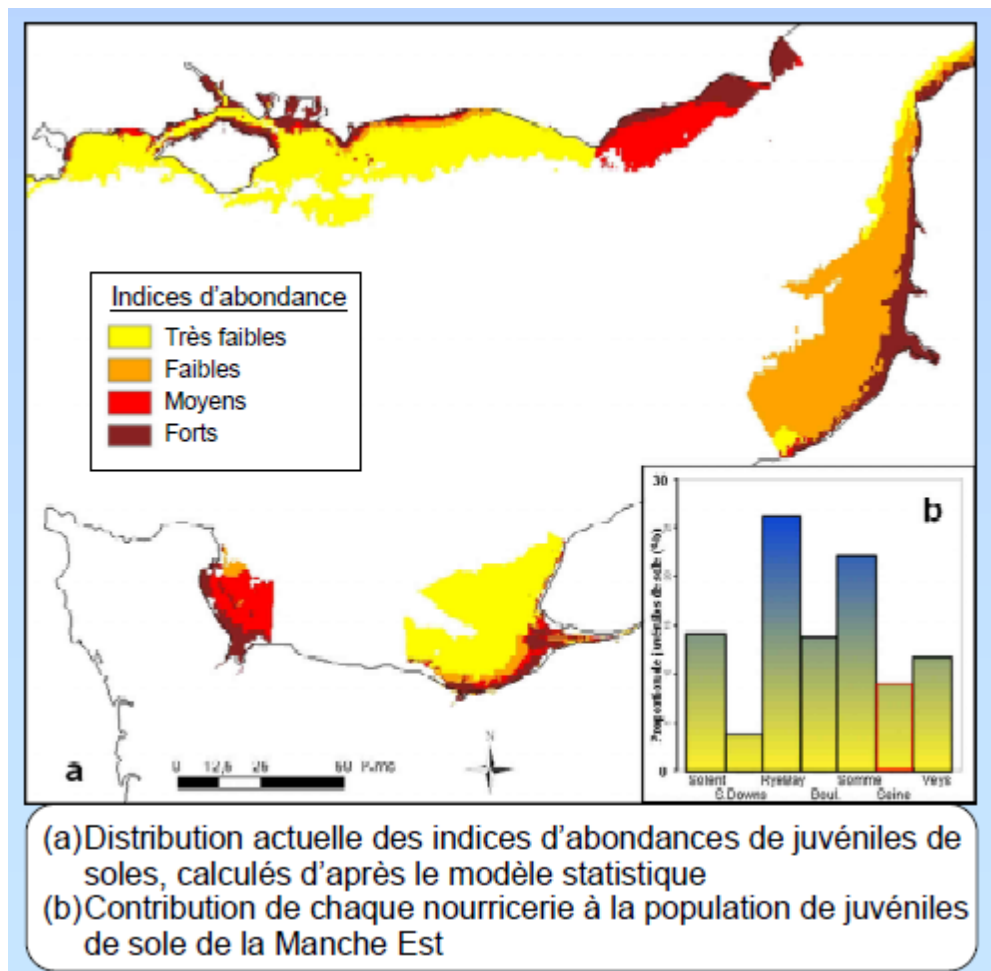
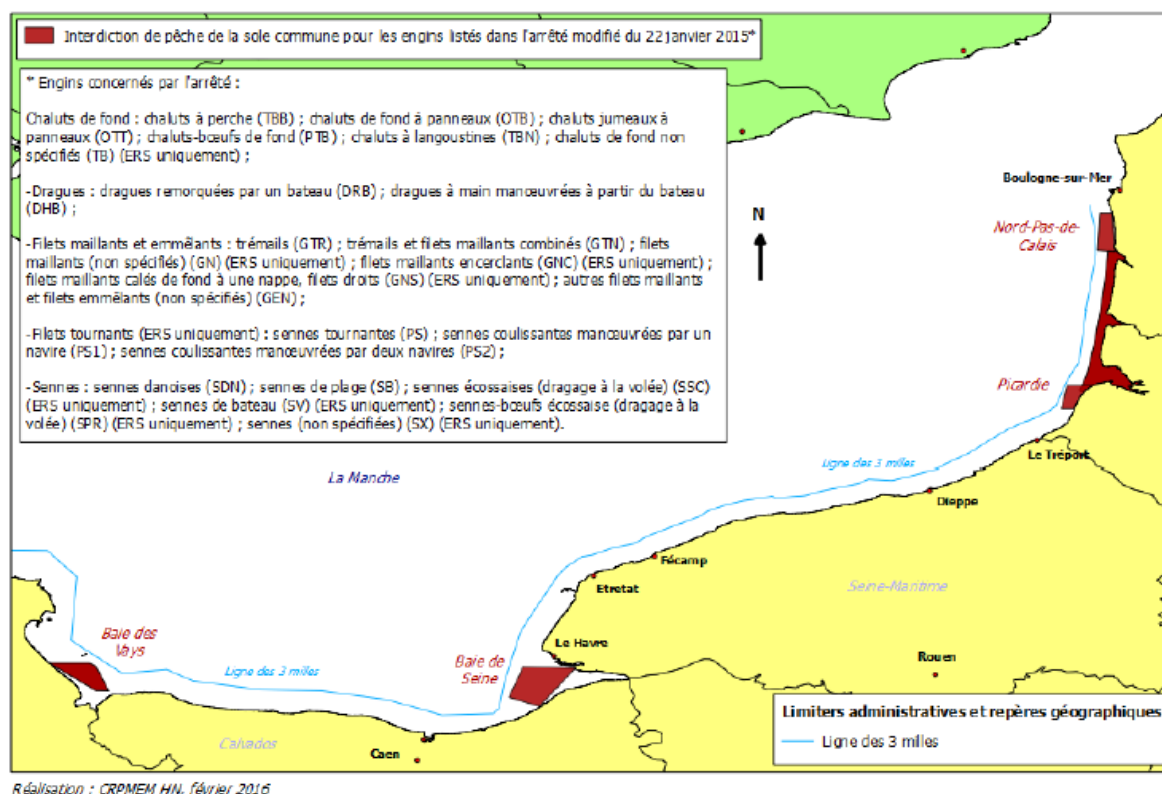


Figure C: Map of distribution of juvenile sole in the various nursery areas around the eastern Channel with chart (b) showing their relative contribution to the eastern Channel stock: from left to right clockwise around the eastern Channel: Solent, South Downs, Ryde Bay (UK), Boulogne (Nord), Somme (Nord / HN), Seine (HN / BN), Veys (BN). Colours represent abundance index of juvenile sole: yellow = very low; orange = low, red = medium, purple = high.

Rochette et al. [http://seine-aval.crihan.fr/web/SilverpeasWebFileServer/Seine-aval\\_A4.pdf?ComponentId=kmelia232&SourceFile=1251962198474.pdf&MimeType=application/pdf&Directory=Attachment/Images/&logicalName=Seine-aval\\_A4.pdf](http://seine-aval.crihan.fr/web/SilverpeasWebFileServer/Seine-aval_A4.pdf?ComponentId=kmelia232&SourceFile=1251962198474.pdf&MimeType=application/pdf&Directory=Attachment/Images/&logicalName=Seine-aval_A4.pdf)



**Figure D: Closed nursery areas under the French VIlId sole management plan (arrêté 22/1/15). Information provided by FROM Nord; map prepared by CRMP-HN.**

As far as MEC can see, there is good correspondence between the closed areas and the areas of medium or high juvenile abundance as identified by Ifremer. MEC could not see any particular evidence of discrimination against BN in terms of the areas closed, which appear on the evidence available to have been selected on objective scientific grounds. MEC is aware that we do not have enough detailed spatial information to evaluate the economic impact of the different closed areas – some may have been more important as fishing grounds than others, and the CRMP-BN may well have a valid point on this basis. Nevertheless, from the MSC point of view, what is significant is that appropriate management measures are taken to protect the stock, based on the best available information, which appears to be the case here.

### 3. Minimum size proposal

The current EU MLS for sole is 24cm (Regulation 850/98). France<sup>42</sup> (Arrêté 22/01/2015) adopted a larger MLS of 25cm for 2016 – the CRPM-BN proposed 26cm but this was not accepted unanimously so was not adopted. It is, therefore, not illegal to retain sole of 25-26cm in BN waters. As in relation to the mesh size, this discussion needs to be seen in the context of an ongoing discussion, within France and more widely (e.g. in the NWWAC) about the management of the eastern Channel stock, in the face of poor recruitment and declining biomass (reflected in the condition on PI 1.2.2). The team concluded that the fact that this discussion is ongoing (with some inevitable disagreement and controversy) is a good thing for the fishery in general, and for the fulfilment of this condition in particular.

<sup>42</sup> Arrêté du 22 janvier 2015 créant un régime national de gestion pour la pêche de la sole commune (*Solea solea*) en Manche Est (division CIEM VIlId)

The team also noted, in relation to this question specifically, that in the context of the landing obligation, management of fisheries via minimum sizes no longer makes much sense (the Commission has proposed converting them to 'conservation reference sizes').

#### **4. Designation and treatment of CRPM-BN as a stakeholder**

MEC apologises for not including the CRPM-BN as a stakeholder from the outset of the assessment process and therefore for not inviting representatives to the site visit. MEC wrongfully assumed that by including the CRPM Nord-Pas-de-Calais and the CRPM Haute Normandie, internal communication between the various CRPMs would ensure relevant information or concerns were shared. It is clear that this was not the case and as soon as MEC were made aware of this omission a dialogue was started with the CRPM-BN. We hope that through the email correspondence, informal consultation at the Normandy and Jersey lobster reassessment site visit, and the present response to the submission made by the CRPM in relation to the PCDR, any outstanding concerns have been addressed.

#### **5. Specific comments**

p24 'Comité Régional de Pêche' : noted that the CRPM-BN also has a 'Commission Filets' (netting commission) and gives out licences

##### **Added**

p76 'Site visits and consultations' Table 22: noted that ' meeting in Jersey about "Jersey and Normandy Lobster" MSC 4th year audit and reassessment- 2 .5 days on Lobster ... not sole !'

**Indeed it was, although useful information was provided on the sole fishery during that meeting. Nevertheless, it was not MEC's intention to mislead, and the wording has therefore been changed.**

## Appendix 3.2 MSC comments

www.msc.org



Marine House  
1 Snow Hill  
London EC1A 2DH  
United Kingdom  
Tel: +44 (0)20 7246 8900  
Fax: +44 (0)20 7246 8901

Date: 04/02/2016

SUBJECT: MSC Review and Report on Compliance with the scheme requirements

Dear Jo Gascoigne

Please find below the results of our partial review of compliance with scheme requirements.

CAB	ME Certification Limited (MEC)
Lead Auditor	Jo Gascoigne
Fishery Name	FROM Nord North Sea and Eastern Channel trammel net sole
Document Reviewed	Public Comment Draft Report

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
19462	Major	168	CR-27.10.5.3 v.1.3	27.10.5 The team shall score individual PIs. 27.10.5.3 If all of the SG80 scoring issues are met, the PI must achieve at least an 80 score and the team shall assess each of the scoring issues at the SG100 level. a. If not	Scoring issue c is not met at the 100 level therefore a score of 100 is not justified.	3.1.1	Apologies, this was a mistake, which has been corrected. The correct score is 95.

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
				all of the SG100 scoring issues are met the PI shall be given an intermediate score (85, 90 or 95) reflecting overall performance against the different SG100 scoring issues. i. Award 90 where performance against the scoring issues is mid-way between SG80 and SG100 (some scoring issues are fully met and some are not fully met); and ii. Award 95 when performance against the scoring issues is almost at SG100 most scoring issues are fully met but a few are not fully met); and iii. Award 85 when performance against the scoring issues is slightly above SG80 (a few scoring issues are fully met but most are not fully met). iv. If all of the SG100 scoring issues are met, the PI shall be given a 100 score.			
19463	Major	181	CR-CB4.10.3 v.1.3	Teams shall interpret a "research plan" in both SG80 and SG100 to mean a written document that includes a specific research plan for the fishery under assessment, relevant to the scale and intensity and the issues requiring research.	The research plan must be a written document specific to the fishery under assessment to meet the SG80 requirement. However, the rationale does not indicate that there is any such document.	3.2.4	The main research concern for this fishery is issues around the dynamics of the target stocks – notably recruitment, definition of reference points and other issues pertaining to the management of the eastern Channel stock in particular. It is clear that research on the dynamics of this stock is a priority in

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
							<p>the context of improving management and generating an appropriate management plan – and this is underway. None of this research is specific to this fishery, and it makes much more sense for this research to be coordinated at a much larger international level (i.e. ICES, NWWAC) as set out in the rationale for this PI.</p> <p>Furthermore, this fishery specifically does not have its own research capacity, nor does it have the capacity to request that research be undertaken on its behalf by the French national marine research agency (Ifremer), since it is an explicit policy of Ifremer that they do not undertake research specifically to support MSC certifications. They could commission research privately, but this would make no sense since the research is already underway as described above.</p> <p>MEC has reviewed the approach to scoring this scoring issue (3.2.4a) in other MSC assessments on stocks shared between more than one fishery. 15 of these fisheries were reviewed (list given at the end). Not one of these fisheries cite a 'written</p>

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
							document specific to the fishery in question'. All the fisheries score 80 or above, based on the fact that there is a coherent approach to research over at least P1 and P2 issues, coordinated by ICES (or in the case of NEA fisheries, by ICES and the joint Russian-Norwegian Fisheries Commission). This is identical with the approach that we have taken. It therefore appears that MSC's comment is not consistent with the approach that has been taken by any of the CABs on other similar fisheries, presumably without comment from MSC (although only a subsample were reviewed – there is a considerable number of these fisheries). On this basis, the score was not changed.
19464	Minor	139	CR-27.10.5.3 v.1.3	27.10.5 The team shall score individual PIs. 27.10.5.3 If all of the SG80 scoring issues are met, the PI must achieve at least an 80 score and the team shall assess each of the scoring issues at the SG100 level. a. If not all of the SG100 scoring issues are met the PI shall be given an intermediate score	The plaice (east channel) scoring element received two 80 scores and two 100 scores which would be a 90 and not 95.	2.1.3	Actually, the error was in the summary scoring table underneath; Eastern Channel plaice scored 100 under scoring issue c, not 80. This has been clarified in the rationale and corrected in the summary table. The overall score for the PI was correct.

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
				(85, 90 or 95) reflecting overall performance against the different SG100 scoring issues. i. Award 90 where performance against the scoring issues is mid-way between SG80 and SG100 (some scoring issues are fully met and some are not fully met); and ii. Award 95 when performance against the scoring issues is almost at SG100 most scoring issues are fully met but a few are not fully met); and iii. Award 85 when performance against the scoring issues is slightly above SG80 (a few scoring issues are fully met but most are not fully met). iv. If all of the SG100 scoring issues are met, the PI shall be given a 100 score.			
19465	Major	91, 180	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 1.1.1 Scoring issue b for VIId: In this case rationale does not support the teams conclusion. How are Bpa and Fpa considered as targets, inconsistent with the intent of those reference points? Fmsy is also recognised as a target, however, the graph shown in the rationale shows that Fmsy is consistently exceeded, rather than 'fluctuating around'		CB2.3.2.3: <i>In some cases, in the absence of explicit biomass targets used for managing a stock, the biomass target or limit reference point for scoring PI 1.1.2 or pre default tree PI equivalents can be implied from fishing mortality reference points, or other proxies, adopted in the management strategy.</i>  The team took this to mean that

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
					<p>the target.</p> <p>PI 3.2.3 Scoring issue d: In principle two, and in comments to the peer reviewer the CAB acknowledges that It is the case that the fishery finds itself in non-compliance with the regulation, which requires all nets set in Division VIIId to have pingers. Yet this is not mentioned in the justification for 3.2.3 d.</p>		<p>biomass reference points should take precedence over F reference points where they exist. In this case there is a reference point set at Bpa / MSY Btrigger, which therefore seemed the most appropriate method by which to score this scoring issue.</p> <p>There is no management plan, so there is nothing that sets the 'intent' of reference points for this stock explicitly. ICES provides advice following the MSY approach (i.e. using FMSY) because this is the framework that has to be applied, but notes that FMSY (and indeed the other F reference points) are poorly defined. This is certainly evident if you inspect the results of the PlotMSY runs (used to estimate F reference points) – these are given in the Figure below, taken from WGNSSK 2014.</p> <p>The intent of MSYBtrigger, in terms of the ICES MSY framework, is to provide a point below which the stock biomass would be outside the normal range expected for BMSY – hence it is a 'trigger' for management</p>

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
							<p>action. As shown in the figure provided in the rationale, the stock biomass has been estimated to be above MSYBtrigger (Bpa) for the entire time series, aside from one year – in other words, it is not outside that normal range for BMSY. Hence SG80 is met.</p> <p>In relation to SG100, this is where the team wished to take into account the fact that F also remains above agreed reference points (pointing out the fact that the F reference points are inconsistent with the biomass 'target' – as noted by ICES) and make this argument as to why SG100 should not be met, despite the biomass trends in relation to MSYBtrigger.</p> <p>Some expansion of the rationale for 1.1.1b has been provided to explain our reasoning more clearly. The scoring has not been changed.</p> <p>3.2.3d A rationale has been added to justify that de facto the requirement no longer applies in this fishery. Justification and references are also given in section 3.5.2.3 of the main</p>

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
							report.
19466	Minor	82, 83	CR-27.12.2.1 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.3 The opportunity of substitution of certified with noncertified fish prior to or at landing fraudulent claims from within and outside ther certified fishery.	The report states on page 83 that the MSC fishery traceability requirements are met up to the point of landing, and that separate chain of custody is required after the first change in ownership. However the report also explains on page 82 that there are auctions and agents in between landing and the first change of ownership. The report should clarify if first sale takes place at auction, and do the auctions have or require CoC? Are there processes in place to maintain separation of certified and non-certified species at auction (i.e. past landing and prior to first sale)?		The agents mentioned (these are in Boulogne only) do not take ownership of the product and do not make any claim to the MSC; they merely handle the product and assist in the identification of buyers. the actual sale (which is indeed the 1 <sup>st</sup> sale) happens at the auctions. The agents therefore do not require separate CoC. In the case of Boulogne, all invoicing happens through SOFETRA which will be listed on the certificate. This has also been clarified in the report. The auctions themselves have traceability and separation systems in place (as described in the report), and product will be clearly marked as MSC both physically and on accompanying documentation. All auctions eligible to sell MSC sole from this fishery have been mentioned in the report and will be listed on the certificate. Further clarifications have been added regarding traceability and the separation between certified and non-certified species post-landing and pre-sale.

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
19467	Guidance	6, 81, 83	CR-27.12.1.3 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.3 The opportunity of substitution of certified with noncertified fish prior to or at landing fraudulent claims from within and outside ther certified fishery.	Page 6 mentions plaice and dab are main retained species. How are these separated on-board from sole, to ensure these non-certified species are not substituted for certified species and do not enter certified chains of custody? Also, if fishing occurs in certified and non-certified areas as mentioned on page 81 and 83, what is the process to ensure the whole catch from that trip is designated as ineligible?		<p>With regard to the potential substitution of plaice and dab with certified sole, the team can really not see how sole could be substituted for either of these species. They are morphologically very different. As the fish are also not processed, any substitution would be immediately noticeable by the fishermen, auctioneers and buyers.</p> <p>The risk of fishing occurring in both certified and non-certified areas is very low, as detailed in the report. In fact, where the team noted (in the logbooks) that a vessel had fished in Division VIIe it is more likely to have been an error in data entry rather than an actual occurrence. Furthermore, a copy of the logbook data accompanies the fish to the auction and fish caught in waters outside the UoC could this way be identified. Should such an incident happen, this will become clear in the logbook data which is entered into the SIOP system. The PO will have primary responsibility for ensuring that only VIId and IVc sole are sold as MSC and this will be verified by MEC at surveillance audits through</p>

Ref	Type	Page	Requirement	Reference	Details	PI	CAB response
							review of the logbook and SIOP data.

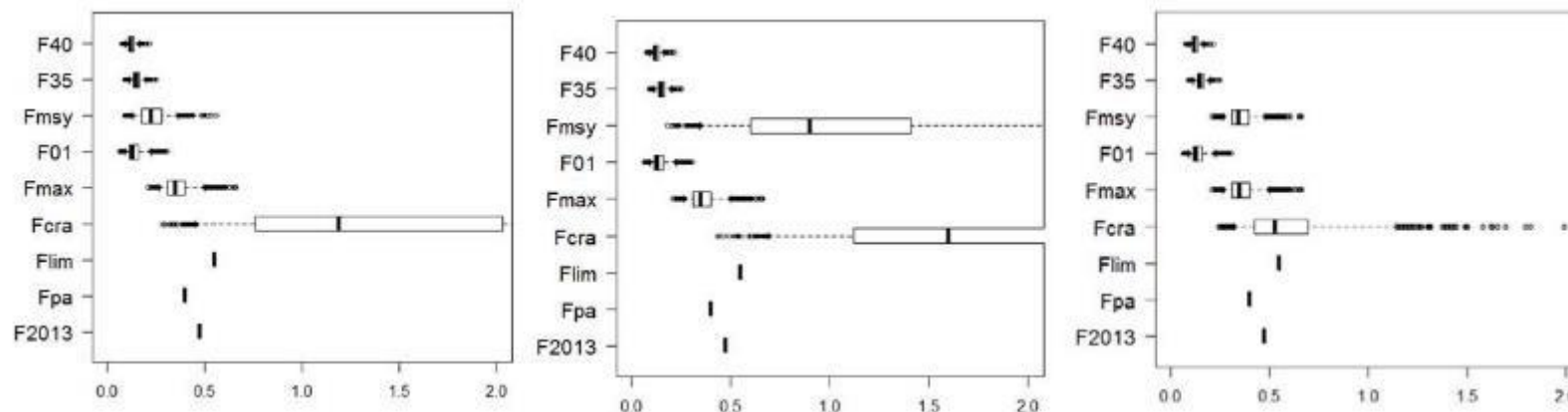


Figure (see comment on 1.1.1 from MSC): Results of  $\text{Plot}_{\text{MSY}}$  in providing estimates of F-based reference points ( $F_{\text{MSY}}$  is third one down): Left – Beverton-Holt stock-recruit curve; Middle – Ricker; Right – smoothed hockey stick. From the report of WGNSSK 2014, Chapter 9 (VIlId sole), Figures 9.8.2-9.8.4.

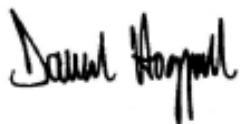
List of fisheries reviewed for approach to scoring of 3.2.4a:

- AGARBA Spain Barents Sea cod (score 100 on the basis of research coordinated by JRNFC)
- Barents Sea cod and haddock (ditto)
- CVO North Sea plaice and sole (score 80 on the basis of research coordinated by ICES)
- Cornish hake gillnet (ditto)
- CSHMAC Celtic Sea herring (ditto)
- DPPO Atlanto-Scandian herring (score 100 – ICES )
- DPPO NEA mackerel (ditto)
- Danish North Sea herring (score 80 – ICES)

- DFPO eastern Baltic cod (ditto)
- DFPO North Sea plaice (ditto)
- DFPO North Sea haddock (ditto)
- Ekofisk North Sea plaice (ditto)
- Estonia NEA prawn (score 80 – joint Russian-Norwegian research and ICES)
- Euronor saithe (score 80 – ICES)

This report is provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and this review should not be considered a checking service. If any clarification is required, please contact Megan Atcheson at [megan.atcheson@msc.org](mailto:megan.atcheson@msc.org) for more information.

Best regards,  
Fisheries Oversight Director  
Dan Hoggarth  
Marine Stewardship Council



cc: Accreditation Services International

## Appendix 4 Surveillance Frequency

1. The report shall include a rationale for any reduction from the default surveillance level following FCR 7.23.4 in Table 4.1.
2. The report shall include a rationale for any deviations from carrying out the surveillance audit before or after the anniversary date of certification in Table 4.2
3. The report shall include a completed fishery surveillance program in Table 4.3.

Table 4.1 : Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
e.g.3	e.g. On-site audit	e.g. 1 auditor on-site with remote support from 1 auditor	e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.

Table 4.2: Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
e.g. 1	e.g. May 2014	e.g. July 2014	e.g. Scientific advice to be released in June 2014, proposal to postpone audit to include findings of scientific advice

Table 4.3: Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
e.g. Level 5	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit & re-certification site visit

## Appendix 5 Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED  
AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection.

(Reference: FCR 7.19.1)

## Appendix 6 Consultation on Conditions

### Document 1

MEMBERS OF THE NWWAC WORKING GROUP 3 (Channel)			
	Member State	Organisation	Main Representative
1	Belgium	Rederscentrale	Emiel Brouckaert
2	EU	Blue Fish	Olivier Le Nézet
3	EU	European Anglers Alliance	John Crudden
4	France	Association Nationale des Organisations de Producteurs	Jacques Pichon
5	France	Comité Départemental des Pêches et des Élevages Marins: CDPMEM 14	Paul François
6	France	Comité Départemental des Pêches Maritimes et des Élevages Marins du Finistère	Romain Le Blois / Manu Kellérine
7	France	Comité Départemental des Pêches Maritimes et des Élevages Marins des Côtes d'Armor	Alain Coudray
8	France	Comité National des Pêches Maritimes et des Élevages Marins	Caroline Gambin
9	France	Comité Régional des Pêches Maritimes et des Élevages Marins de Basse Normandie	Daniel Lefèvre
10	France	Comité Régional des Pêches Maritimes et des Élevages Marins de Bretagne	Olivier Le Nézet
11	France	Comité Régional des Pêches Maritimes et des Élevages Marins de Haute-Normandie	Alexis Maheut
12	France	Comité Régional des Pêches Maritimes et des Élevages Marins du Nord / Pas de Calais / Picardie	Dolphine Roncin
13	France	Coopératives Maritimes Eclopsées & Armement Coopératif Artisanal du Nord	Dominique Thomas
14	France	Copeport Marée OPBN	Richard Brouzas
15	France	Fédération des Organisations de Producteurs de la Pêche Artisanale	Victor Bouvard
16	France	France Pêche Durable et Responsable	Jacques Bigot
17	France	FROM Nord	Thierry Missionier
18	France	OP COBRECORD	Damien Verzele
19	France	Les Pêcheurs de Bretagne SA	Jacques Pichon
20	Ireland	Irish Fishermen's Organisation	John Lynch
21	Ireland	Irish South and East Fish Producers Organisation	Hugo Boyle
22	Netherlands	Dutch Elasmobranch Society	Irene Kingma
23	Netherlands	Stichting van de Nederlandse Visserij - Dutch Fisheries Organisation (1)	Anton Dekker
24	Netherlands	Stichting van de Nederlandse Visserij - Dutch Fisheries Organisation (2)	Geert Meun
25	Spain	Fundació ENT	Stéphane Beauchet
26	UK	Cornish Fish Producers Organisation	Paul Trebblecock
27	UK	National Federation of Fishermen's Organisations	Barrie Deas

MEMBERS OF THE NWWAC WORKING GROUP 3 (Channel)			
	Member State	Organisation	Main Representative
28	UK	New Under Ten Fishermen's Association	Dave Cuthbert
29	UK	Scallop Association	John Hemme
30	UK	Scottish Fishermen's Federation	Bertie Armstrong
31	UK	The Scottish White Fish Producers Association	Anne-Margaret Anderson
32	UK	South West Fish Producers Organisation	Jim Portus
33	UK	World Wildlife Fund	Lyndsey Dodds / Helen McLachlan



## North Western Waters Advisory Council

19 June 2015

### ADVICE

#### ***Towards a Management Strategy for the sustainable exploitation of the stock of sole (Solea solea) in ICES Division VIId (East Channel)***

#### **Background**

The [June 2014 advice](#)<sup>1</sup> from the International Council for the Exploration of the Sea (ICES) indicated that for two successive years (2012 & 2013) recruitment for the sole stock in ICES Division VIId was very low. Recruitment has always fluctuated without trend and there is no obvious explanation for this present evident drop in recruitment compared to recent years of good recruitment. Since 2005, fishing mortality ( $F$ ) has been above  $F_{pa}$  (0.4) but below  $F_{lim}$  (0.55), with a noted increase in 2013. The SSB was at its highest level in 2012 since 1982, well above  $MSY B_{trigger}$ , but showed a steep decline in 2013. From 2011, ICES advice moved away from being based on  $F_{pa}$  (0.4) in transition to  $F_{MSY}$  (0.29), the Fishing Mortality deemed necessary for long-term maximum sustainable yield. Stock sustainability objectives of the CFP aimed to achieve  $F_{MSY}$  by 2015, or as soon as possible thereafter. Other objectives of the CFP should also be observed, such as those in Article 2 that "fishing... activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies".

At the December Council 2014 the French authorities committed to implementing as of 1 January 2015 a set of management measures aimed at those vessels targeting sole in VIId. These include a specific licensing permit scheme for sole fishers, a 10% reduction in the number of days at sea compared to 2014 for the static gear and beam trawl metiers, and the obligation for the vessels with a sole-licence to use VMS, and, the setting of a maximum net length for all static gear metiers and the year-round closure to fishing of four inshore sole nursery areas.

The Belgian authorities committed to increasing the mesh size in the lengthening piece from 80 mm to 120 mm for beam trawlers targeting sole in VIId and joined France in supporting the closure of the four nursery areas.

<sup>1</sup> Advice ICES. 2014. Sole in Division VIId (Eastern Channel). In Report of the ICES Advisory Committee, 2014. ICES Advice, 2014. Book 6, Section 6.4.1.



DG Mare contacted the NWWAC by letter (Ref. Ares(2015)2062834 - 18/05/2015) to indicate the need for further work, taking into account the current transitory measures and expanding them to cover all relevant métiers and Member States. This is especially relevant since early indications for ICES advice are for a further decrease of the TAC. The NWWAC is asked to design an advice on a proposal for management measures for this stock by the middle of June, in time for preparation of the STECF plenary 6-10 July. This would allow for a finalized, refined proposal in time for the December Council.

### Scope

Sole stocks in the North Sea, the Western channel and the Bay of Biscay (Area IV and Divisions VIIe and VIIIab) are managed through (proposed) management plans. These plans are unique to the stocks but the NWWAC is aware of these plans and the positive results of plans that were developed in cooperation with stakeholders and scientists. The NWWAC would be looking for management based on voluntary stakeholder input as is done for sole in the Bay of Biscay. Learning from the experience of a rigid plan as used for the Western channel, annual adjustments of management should be possible to avoid unintended consequences arising from rigidity of multiannual objectives.

The Eastern Channel sole stock may be influenced by potential mixing of North Sea and western sole into the area. It is anticipated that the fishable biomass for sole in the area will respond well to the recovery of biomass in the North Sea and Western channel sole stocks.

Multi-annual plans (MAPs) are an objective in the CFP. For the North Sea, work is in progress on a MAP using a multi-species approach. In the views on how to address stocks from adjacent areas it is intended to include Sole VIIId in the North Sea plan. Being part of a multi-species plan means that  $F_{MSY}$  ranges for this stock will be assessed instead of pinpointed reference points.

Management should encompass all métiers that fish for sole in the Eastern Channel. In respect of applying different measures to different gears it is up to Member States holding Sole VIIId quota to define their national static gear, beam trawl and other trawls.

### Objectives

The NWWAC considers management should aim to achieve the CFP objectives for this stock by 2020 at the latest by means of proportionate and appropriate measures.

Additionally, further improvement of the exploitation pattern (avoiding juvenile sole by means of improved selectivity or adapted fishing patterns) should be an objective within a management strategy for Sole in the Eastern Channel.



## Measures in place in 2015

1. Cod management plan ((EC) 1342/2008): for the Eastern Channel in combination with the North Sea effort restrictions are in place for all métiers implied in the plan.
2. French measures (licensing, effort restrictions and nursery closures as mentioned above)
3. Belgian measures (technical measures and nursery closures, as mentioned above)
4. Relevant to fisheries management in the area, in the UK there are Sussex IFCA Byelaws, with certain exceptions and for the purposes of protecting juveniles of all fish species, prohibiting trawling within 0.25 miles seaward of the line of Lowest Astronomical Tide from 1st May to 31st October each year. Similarly the UK Southern IFCA Byelaws with certain exceptions prohibit trawling within 1 mile of the coast between 1st May and 31st August. Around 45% of the UK quota (9% of the TAC) is MSC certified through the Hastings sole fisheries.

## Advice

The work of the NWWAC was helped by an evaluation of different management measures for the Eastern channel Sole stock prepared by IFREMER<sup>2</sup>. The NWWAC advises to focus on a TAC management strategy in the IFREMER document targeting  $F_{MSY}$  by 2020:

- A. Reduce the TAC in 2016 to 3000 t (14% reduction).
- B. Keep the TAC constant to reach  $F_{MSY}$  in 2020 at the latest.

The NWWAC considers that management measures should not preclude the taking into account any new circumstances or availability of updated information.

Additionally, technical measures as the evaluated by STECF should be considered if these are considered appropriate such as:

1. Closed nursery areas on the French coast as already defined,
2. Nursery areas on the UK coast to be defined, to be closed seasonally or year-round, taking into account that Marine Conservation Zones (MCZs) that may benefit sole stocks are being established by the UK in this area in 2015,
3. For beam trawlers – if fitted, a lengthening piece should consist of at least 3 meters of 120 mm, as evaluated by STECF<sup>3</sup>,
4. Length of static gear should be maximized to avoid increase (like 1 km/m vessel length),

<sup>2</sup> Vermard Youen, Savina-Rolland Marie, Biseau Alain (2015). Evaluation de mesures de gestion pour le stock de sole en Manche est. Réponse de l'Ifremer à la saisine DPMA 15-8452. 18p.

<sup>3</sup> Scientific, Technical and Economic Committee for Fisheries (STECF) – 48th Plenary Meeting Report (PLEN-15-01). 2015. Publications Office of the European Union, Luxembourg, EUR 27220 EN, JRC 95802, 75 pp.



5. Biomass safeguard – in case the TAC rule in itself would not be evaluated to reach  $F_{MSY}$  as planned, then a biomass threshold could be included in the rule under B in order to reduce risks of depleting biomass to less than 5%,
6. Recreational sole fisheries may be restricted or closed,
7. Redress lack of scientific data/surveys – the NWWAC promotes cooperation between industry/science to improve data collections. Reinstating the international contribution of the UK-YFS is advised by ICES to improve the assessment.

#### Conclusions

- This first advice for a management strategy has been prepared in a fast track to be available in time for the STECF plenary session in July 2015 and the NWWAC would appreciate an evaluation of the measures.
- NWWAC welcomes the opportunity to be involved in further development of a management strategy in order to come to a conclusion in time for the December Council 2015.

**--END--**

Document 3



Dossier de dépôt de projet – Appel à projets 2015

## PRESENTATION DU PROJET (1 PAGE)

### NOM et ACRONYME DU PROJET

Sole de Manche Est: amélioration des connaissances pour une meilleure gestion du stock (SMAC)

### RESUME (1/2 page maximum)

La sole commune (*Solea solea*) fait partie des espèces commerciales majeures de la Manche Est. La mortalité par pêche, supérieure au  $F_{RMD}$ , et les faibles recrutements récents ont conduit experts et gestionnaires à proposer plusieurs baisses successives du Total Autorisé de Captures (TAC) depuis 2013. Ces baisses répétées sont difficiles à supporter par la profession, les principales flottilles concernées étant devenues très dépendantes de la sole du fait des mesures du plan de restauration du cabillaud et d'autres mesures de gestion, comme les TAC restrictifs sur les raies.

Ce projet est le fruit de discussions entre scientifiques de l'Ifremer et les représentants de la profession, portant sur les principaux manques de connaissances et les incertitudes dans la compréhension de la dynamique du stock de Sole Manche Est. Les recherches proposées visent à améliorer les connaissances biologiques et écologiques, et à les intégrer dans les modèles d'évaluation des stocks. Le projet s'articule autour de trois axes de recherche:

- 1 Structure spatiale des populations et connectivité : (a) Quelles sont les frayères et les nurseries de provenance des adultes capturés en Manche Est, quelle est la contribution des différentes nurseries côtières au recrutement total en Manche Est ? (b) Quels sont les mouvements des adultes (1) intra Manche Est, et (2) avec la Manche Ouest et le sud Mer du Nord ? Comment intégrer les connaissances sur la structure spatiale dans les modèles d'évaluation des stocks, et quelles conséquences pour les avis scientifiques sur la gestion du stock et des habitats essentiels à son renouvellement ?
- 2 Recrutement : Quelle est la variabilité spatio-temporelle des densités de larves et de juvéniles, et comment l'unique campagne actuelle d'évaluation du recrutement (NOURSOM) en rend compte ? Est-il possible de mettre en place une 2<sup>e</sup> campagne pérenne en collaboration avec les professionnels, et quels gains peut-on en espérer ?
- 3 Pratique de pêche et sélectivité : Quelle est la sélectivité des engins utilisés ? Comment l'améliorer ? Quelles sont les pratiques des professionnels (différences régionales et évolution) ? Quelle est l'efficacité des mesures de gestion en cours et à venir (spatiales, temporelles) en termes de sélectivité ?

Le travail de terrain nécessaire dans les différents axes de travail sera réalisé dans le cadre de collaborations scientifiques-professionnelles (travail embarqué, ateliers de discussion).

L'ensemble de ces données sera utilisé pour améliorer les modèles de dynamique de stock et d'expertise pour l'aide à la décision en lien avec le CIEM.

### PORTEUR DU PROJET

IFREMER HMMN

### BUDGET GLOBAL DU PROJET (euros)

1.501.386 euros

### AXE (S) THEMATIQUE(S) DU PROJET :

- ☒ Acquisition de connaissances halieutiques
- ☒ Acquisition de connaissances dans un objectif d'évaluation et de gestion des principaux stocks exploités
- ☒ Amélioration des prévisions de recrutement
- ☒ Développement des moyens d'acquisition de données
- ☒ Diminution des rejets pour les espèces soumises à l'obligation de débarquement
- ☒ Sélectivité des engins de pêche
- ☒ Amélioration des connaissances sur les stratégies d'évitement
- ☐ Caractérisation des espèces à haut taux de survie
- ☐ Amélioration des connaissances sur les effets de l'utilisation des principaux engins trainants sur les habitats

#### OBJECTIFS ET FINALITES DU PROJET (5 à 6 lignes)

Ce projet vise à renforcer notre compréhension de la dynamique du stock de sole de Manche Est et de son exploitation. En lien avec le groupe de travail Manche Est Mer du Nord du CIEM (WGNSSK), les connaissances acquises sur les structures spatiales de la ou des populations au cours du cycle de vie, sur la sélectivité de la pêche ainsi que sur les diagrammes d'exploitation permettront d'améliorer les modèles d'évaluation des stocks. D'autre part, ce projet vise également à définir et mettre en place une campagne d'évaluation du recrutement conjointe (professionnels – scientifiques) qui se poursuivrait à l'issue du projet, et qui compléterait l'unique campagne existante.

#### Durée du projet(en mois)

36

#### Date de démarrage envisagée

Décembre 2015

#### LABELLISATION par un Pôle de compétitivité (oui/non, lequel)

Une demande de labellisation de ce projet par le pôle Aquimer est déposée conjointement à ce projet

## LE PORTEUR ET PARTENAIRES TECHNIQUES DU PROJET

	Nom entreprise/organisme N° SIRET Adresse de l'organisme	Nom et fonction du contact	Assujetti / Non Assujetti à la TVA	Rôle du porteur/partenaire dans le projet
1	IFREMER - Centre Manche Mer du Nord 150, quai Gambetta BP 699 62321 Boulogne sur Mer cedex 330 715 368 000 24	Marie Savina-Rolland Cadre de recherche	Non assujetti	Porteur, travaux scientifiques
2	Agrocampus Ouest 65, rue de Saint Briec CS 84215 35042 Rennes cedex SIRET : 13000512700019	Olivier Le Pape Professeur	Non assujetti	Travaux scientifiques
3	CRPM Nord Pas de Calais/Picardie 12 rue Solférino 62200 BOULOGNE SUR MER SIRET : 420 958 738 000 23	Delphine Roncin Secrétaire générale	Non assujetti	Coordination/facilitation des contacts scientifiques professionnels (co-organisation et participation aux ateliers, coordination des embarquements et affrètement de bateaux), communication sur la campagne de marquage et sur le projet.
4	CRPM Haute Normandie 26 quai Gallieni 76200 DIEPPE Siret : 400 781 902 000 38	Sonia Muller Secrétaire générale	Non assujetti	Coordination/facilitation des contacts scientifiques professionnels (co-organisation et participation aux ateliers, coordination des embarquements et affrètement de bateaux), communication sur la campagne de marquage et sur le projet.
5	CRPM Basse Normandie 9, quai du général Lawton Collins. BP 44550104 Cherbourg cedex 322 365 602 000 59	Béatrice Harmel Secrétaire générale	Non assujetti	Coordination/facilitation des contacts scientifiques professionnels (co-organisation et participation aux ateliers, coordination des embarquements et affrètement de bateaux), communication sur la campagne de marquage et sur le projet.
6	Organisation de Producteurs « FROM Nord » 16 rue du Commandant CHARCOT 62200 Boulogne Sur Mer Siret : 783 953 086 00023	François HENNUYER Directeur Délégué Manon JOGUET Chargée de mission	Non assujetti	Coordination/facilitation des contacts scientifiques professionnels (co-organisation et participation aux ateliers, coordination des embarquements et affrètement de bateaux), communication sur la campagne de marquage et sur le projet.

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7	CME Port de Capécure - 25, Bd de Chatillon B.P. 203 62203 Boulogne-sur-Mer Siret : 61592004800019	Dominique Thomas	Non assujetti	Coordination/facilitation des contacts scientifiques professionnels (co-organisation et participation aux ateliers, coordination des embarquements et affrètement de bateaux), communication sur la campagne de marquage et sur le projet.
8	OPBN 4, quai Philippe Oblet 14520 Port en Bessin SIRET : 506 720 044 00011	Mathieu Vimard Directeur adjoint	Non assujetti	Coordination/facilitation des contacts scientifiques professionnels (co-organisation et participation aux ateliers, coordination des embarquements et affrètement de bateaux), communication sur la campagne de marquage et sur le projet.
9	UMR BOREA Museum National d'Histoire Naturelle - DMPA 61, Rue Buffon, CP 53 75231 Paris Cedex 05	Philippe Koubbi Professeur	Non assujetti	Travaux scientifiques

Sous-Traitants éventuels et rôles :

Autres acteurs impliqués dans le projet (sans implication financière) (ex : collaboration scientifique via des groupes de travail, ....)

Les résultats de ce projet seront présentés et discutés au groupe d'évaluation Manche Est Mer du Nord du CIEM (WGNSSK).

## CONTEXTE DU PROJET

### Contexte économique

Trois pays contribuent aux captures de sole en Manche Est : la France, majoritaire, la Belgique et la Grande Bretagne. Depuis 2000, la part de la France dans les débarquements totaux fluctue autour de 60%. En 2012, 268 navires français, embarquant 885 marins, ont débarqué de la sole de Manche Est.

Les filets contribuent à hauteur de deux tiers des débarquements français, les chaluts de fond à hauteur d'un quart, le reste étant capturé par divers engins.

#### Flottes concernées par le projet

Dans la zone Nord Pas de Calais Picardie :

- 72 fileyeurs purs, basés principalement dans les ports de Dunkerque, Calais et Boulogne-sur-Mer, dépendent à 80 % en moyenne de la sole. Ce sont des navires de 12 mètres environ, travaillant en zone IVc, et surtout en VIId.
  - une trentaine de navires polyvalents (chalutiers de fond, ou à perche), basés à Boulogne-sur-Mer et en Baie de Somme/Le Tréport, d'environ 12 mètres, pêchent également cette espèce mais pas à titre principal pour la plupart.
- En 2014, le chiffre d'affaires (CA) "Sole" de l'ensemble des adhérents FROM Nord était de 5 997 600 € pour 735 tonnes de soles débarquées.

En Haute Normandie :

- 94 navires travaillent la sole, dont 40 fileyeurs purs, 51 chalutiers purs, et 3 navires polyvalents (2013). Ils sont basés dans les ports du Tréport, de Dieppe, de Fécamp, d'Antifer et du Havre, et pêchent quasiment exclusivement dans le VIId. Parmi ces navires, 18 ont un taux de dépendance à la sole compris entre 25 et 50 %, et 6 entre 50 et 75 %.
- En 2014, le CA "Sole" de l'ensemble des adhérents FROM Nord (largement majoritaire en Haute Normandie) était de 2 379 744 € pour 260 tonnes de soles débarquées.

Enfin, en Basse Normandie :

- 150 chalutiers polyvalents de 10 à 16 mètres ciblent plus ou moins la sole en alternance avec le maquereau ou le « divers » durant les mois d'été. Ils travaillent exclusivement en zone VIId.
- Quelques navires de 7 à 16 mètres utilisent le filet maillant à sole le plus souvent en alternance avec d'autres métiers : casier, drague ; seuls 2 navires pratiquent ce métier à l'année
- Enfin, quelques navires utilisent le chalut à perche, également en alternance avec la drague et en alternance avec la zone VIIe, et le chalutage hauturier réalise des captures accessoires.

Le total des captures de sole venant de la zone VIId sont de l'ordre de 500 tonnes annuelles pour 5 millions d'euros pour les adhérents de l'OPBN (les débarquements hors OPBN sont estimés à 130 tonnes). Les débarquements sont répartis dans tous les ports du Calvados et de l'Est Cotentin. Pour la flottille de chalutiers-dragueurs côtiers de Baie de Seine, la sole représente environ 15 à 20% de leur CA annuel mais 50 à 75% durant les mois d'activité au chalut.

Les flottilles de fileyeurs purs ont été fragilisées ces dernières années à la fois par les mesures du plan de restauration du cabillaud et les mesures de gestion sur les raies. Ainsi, auparavant, leurs activités étaient réparties selon les saisons entre la sole, le cabillaud, le turbot, la raie et divers autres poissons (plie, roussette,...). Ces dernières années, la pêche s'est centrée sur la sole, d'où l'importance de cette espèce pour les armements et les difficultés économiques engendrées par la décroissance rapide du TAC depuis 2 ans et, plus généralement, par l'instabilité des mesures de gestion de cette espèce.

Pour le chalutage côtier de fond, les possibilités de diversification sont très faibles vu la réduction générale des quotas en Manche Est (cabillaud, raies, merlan, plie ...). Seul le maquereau pourrait le permettre actuellement mais avec un nouvel engin (OTM) et sous réserve de présence de la ressource et de marchés.

#### Importance économique du stock au sein de la flottille concernée par le projet

La sole VIId représente en moyenne 32% du chiffre d'affaire total des flottilles débarquant ce stock (données SIH 2012).

La sole est la première espèce en valeur débarquée à Boulogne-sur-Mer ces dernières années (plus de 8 millions d'euros facturés en criée en 2013 et 2014), avec des débarquements enregistrés à Boulogne aux alentours de 1 000 tonnes en 2013 – 2014 (CRPM NPdC Picardie)

### Contexte scientifique

Les procédures d'évaluation et de gestion de la sole de Manche Est considèrent l'existence d'un stock homogène en Manche Est (biomasse totale estimée en 2013 : 14 662 tonnes), séparé du stock de Mer du Nord à l'Est (biomasse totale estimée en 2013 : 48 873 tonnes) et du stock de Manche Ouest (biomasse totale estimée en 2013 : 3 489 tonnes).

Le stock de Manche Est est considéré comme étant globalement surexploité. La mortalité par pêche sur ce stock fluctue sur l'ensemble de la période étudiée (1980-2014) à des niveaux supérieurs à la valeur retenue pour  $F_{RMD}$  (Figure 1,  $F_{RMD}=0.3$ ).

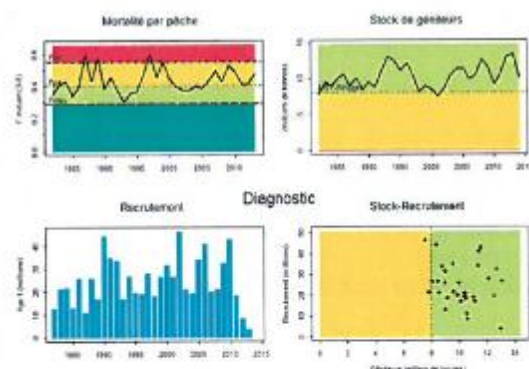


Figure 1 : Diagnostic CIEM 2014 pour la sole 7D.

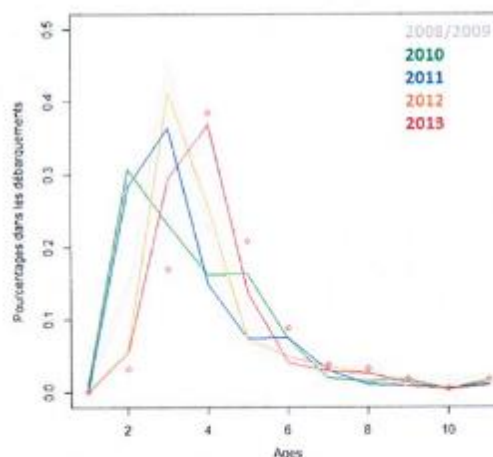


Figure 2 : Structure en âge des débarquements pour 2008 à 2013.

Dans les 5 dernières années, les captures ont été principalement portées par la classe d'âge née en 2009, dernière année à avoir montré un recrutement important (Figure 2, individus d'âge 1 en 2010 sur le graphique « Recrutement »). Les valeurs des recrutements récents (individus nés en 2010-2012), sont peu précises, mais elles sont estimées inférieures à la moyenne de la série étudiée (1980-2014). A exploitation constante, une décroissance de la biomasse est attendue dans les prochaines années.

Aujourd'hui, l'évaluation du recrutement est en large partie basée sur une campagne d'estimation d'abondance des juvéniles réalisée sur une seule zone de nurserie côtière (la baie de Somme), alors que plusieurs nurseries de productivités différentes, et non synchrones selon les années, participent au recrutement du stock de Manche Est. Ainsi, améliorer notre connaissance de la dynamique spatio-temporelle du recrutement devrait contribuer à la qualité des évaluations.

Par ailleurs, si le stock de Manche Est est aujourd'hui considéré comme une entité homogène, des travaux scientifiques récents suggèrent l'existence d'une forte structuration spatiale du stock de Sole en Manche Est, marquée par une faible connectivité entre plusieurs sous-populations, chacune alimentée par un pool distinct de nurseries côtières (Figure 3). Si l'existence d'une forte structuration spatiale est avérée, une gestion proposant une optimisation de la répartition spatiale de l'exploitation pourrait permettre de mieux adapter l'exploitation au potentiel de production de chaque sous-population. Ainsi, l'amélioration des connaissances sur la structure spatiale du stock de Manche Est et de la connectivité entre différentes sous-populations, et l'intégration de ces connaissances dans les modèles d'évaluation sont des enjeux importants pour améliorer la qualité des avis scientifiques pour la gestion. Enfin la dynamique spatiale de la pêcherie et la sélectivité des principaux engins de pêche est encore mal connue, ce qui rajoute à la difficulté d'anticiper l'effet de mesures de gestion.

Un benchmark sur l'évaluation de ce stock a été demandé par le groupe de travail concerné du CIEM (WGNSSK) pour 2016, dans l'objectif de faire évoluer les méthodes d'évaluation de ce stock pour améliorer la qualité des avis scientifiques rendus et d'optimiser la gestion de l'exploitation.

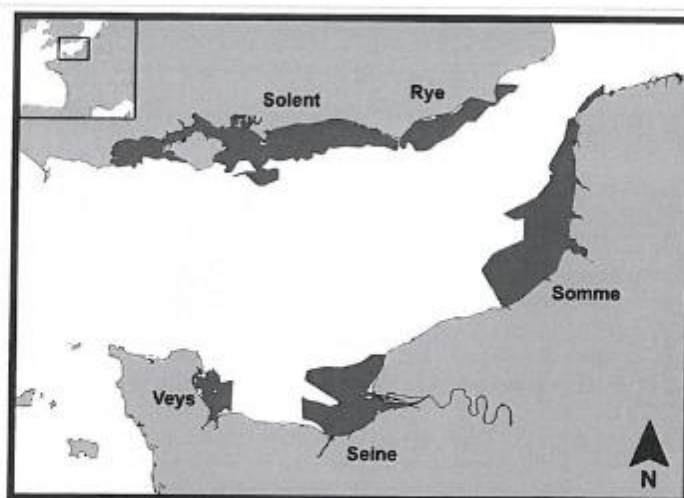


Figure 3 : Répartition des principales zones de nurricerie de la sole en Manche Est

#### Contexte réglementaire

La sole de Manche Est n'est actuellement soumise à aucun plan de gestion.

L'avis scientifique rendu par le CIEM en 2014, en se basant sur l'application de l'approche de transition (réduction progressive de la mortalité par pêche pour atteindre  $F_{RMD}$  en 2015), recommandait une baisse de 60% du TAC pour 2015. Sous l'égide de la DPMA, la profession et ses représentants (CRPM, CNPM et OP) se sont mobilisés pour proposer un ensemble de mesures de gestion, à appliquer à partir de 2015, en contrepartie d'une baisse moindre du TAC. Dans ce cadre, l'IFREMER a été saisi à deux reprises pour évaluer les mesures proposées. Une baisse de 28% a finalement été décidée à l'issue du conseil des ministres européens de la pêche en décembre 2014, et un régime national de gestion pour la pêcherie de la sole commune en Manche Est a été créé par l'arrêté du 22 janvier 2015 incluant des éléments de gestion spatialisée. Ce régime de gestion doit encore être validé par le CSTEP et les professionnels sont toujours en demande d'amélioration de la connaissance et de l'impact de ces plans de gestion sur la dynamique du stock de Sole de Manche Est et sur les flottilles qui l'exploitent. Ces demandes nationales rejoignent un questionnaire international autour de la mise en place d'un plan de gestion communautaire. Dans le cadre de la définition de ce plan de gestion communautaire, les professionnels français ont ciblé leur effort sur une réduction de l'effort de pêche de 10% des flottilles ciblant la Sole, une interdiction de pêche dans les zones de nurriceries et l'équipement VMS obligatoire pour tous les navires ciblant la Sole. Les professionnels belges ont quant à eux opté pour des augmentations de maillage de leurs engins de pêche. Toutes ces mesures doivent être évaluées par le CSTEP et serviront de base à la mise en place d'un réel plan de gestion de cette espèce dans cette zone.

En revanche, la connectivité induite par les mouvements des stades adultes et son influence sur la structure spatiale des populations est beaucoup moins connue. Des travaux de marquages anciens et ne couvrant qu'une faible partie de la Manche Est ont semblé montrer des déplacements et des échanges limités (Kotthaus, 1963<sup>14</sup>; Burt et Millner, 2008<sup>15</sup>) avec toutefois des échanges avec la mer du Nord au niveau du Pas de Calais. Les travaux menés jusqu'à ce jour sur la base d'analyses génétiques n'ont pas permis de mettre en évidence l'existence d'une structuration des populations de Manche Mer du Nord (Cuveliers et al., 2012<sup>16</sup>). Ainsi, l'amélioration des connaissances sur la structure spatiale du stock de Manche Est et de la connectivité entre différentes sous-populations, et l'intégration de ces connaissances dans les modèles d'évaluation sont des enjeux importants pour améliorer la qualité des avis scientifiques pour la gestion.

La dynamique du recrutement en Manche Est reste aussi encore assez mal connue. Une série de travaux antérieurs à ce projet a permis de développer une bonne connaissance de la vie juvénile des soles en Manche Est. A l'issue de la dérive larvaire et de la métamorphose, les juvéniles se concentrent dans des nourriceries côtières et estuariennes (Riou et al., 2001 ; Rochette et al., 2010<sup>17</sup>) où ils subissent une mortalité densité dépendante (Archambault et al. 2014<sup>18</sup>) avant de quitter les nourriceries à l'âge moyen de 2 ans. A partir de campagnes d'échantillonnage et de données sur la structure et la surface des habitats de nourriceries, la contribution relative moyenne de différents secteurs de nourricerie des côtes françaises et anglaises en terme de nombre de juvéniles produits est elle aussi estimée (Riou et al., 2001 ; Rochette et al., 2010 ; Rochette et al., 2013). Mais malgré cette bonne connaissance de l'écologie des juvéniles de sole pendant leur phase sur nourricerie, les fluctuations interannuelles d'abondance au sein des différents secteurs de nourricerie ont été relativement peu étudiées. En conséquence, si les méthodes quantitatives d'évaluation de stock (basées sur le suivi des captures aux âges) permettent une bonne estimation du recrutement a posteriori (c'est-à-dire plusieurs années après la naissance de la classe d'âge), l'évaluation du recrutement de la sole Vlid pour les années récentes est emprunte d'une large incertitude. En effet, elle est basée sur une campagne d'estimation d'abondance des juvéniles réalisée sur une seule zone de nourricerie côtière (la baie de Somme), la seule campagne annuelle depuis l'arrêt de la campagne anglaise en 2006. L'analyse des variations interannuelles sur des secteurs distincts (e.g. sur les côtes françaises, baie des Veys, estuaire de Seine, baie de Somme) a pourtant montré que plusieurs nourriceries de productivités différentes, et non synchrones selon les années, participent au recrutement du stock de Manche Est (Rochette et al., 2010 ; Rochette et al. 2013, et références associées). Ainsi, une estimation d'abondance de juvéniles sur un site donné ne permet pas de déduire le recrutement à l'échelle du stock.

Enfin, la dynamique spatiale et la sélectivité de la pêcherie de sole en Manche Est restent encore assez mal connues. Si le CIEM considère que les rejets sont négligeables à l'échelle du stock, cela n'est pas généralisable à tous les métiers concernés. Ainsi, les observations effectuées à bord des navires de pêche montrent qu'en 2012 (OBSMER, 2013<sup>19</sup>) les rejets de sole du métier 'Chalutiers de fond inférieurs à 18 m en Manche-Est et Mer du Nord (OT DEFY)' représentent 44% des captures de cette espèce. Ce taux de rejets important est le fait de soles de petites tailles. Les conséquences sur le stock de ce taux de rejet important sont cependant à relativiser car la contribution de ce métier aux débarquements de sole internationaux est relativement faible (14%). Malgré tout, il montre que les captures de petites soles peuvent être localement importantes [la plupart des observations ont eu lieu en Baie de Seine]. C'est très vraisemblablement le cas également pour les captures des dragues à dents (non échantillonnées) engin peu sélectif et qui est opéré en Baie de Somme, autre zone de nourricerie. Des travaux préliminaires montrent que les captures effectuées dans les zones de nourricerie se différencient, à la fois au niveau des débarquements et des rejets, de celles effectuées plus au large. Cette différence reste cependant mesurée, et son estimation précise se

<sup>13</sup> Le Pape O., Cognez, N. (2015, sous presse). The range of juvenile movements of estuarine and coastal nursery dependent flatfishes: estimation from a meta-analytical approach. *Journal of Sea research*

<sup>14</sup> Kotthaus, A. (1963) Tagging experiments with the North Sea sole (*Solea solea*) in 1959 and 1960. Spec. Publ. Int. Commn. NW. Atlantic Fish 4:123-129.

<sup>15</sup> Burt, G.J. and Millner, R.S. 2008. Movements of Sole in the Southern North Sea and Eastern English Channel from Tagging Studies (1955-2004). Lowestoft: CEFAS, 44 pp.

<sup>16</sup> Cuveliers E, Larmuseau M, Hellemans B, Verherstraeten S, Volckaert F, Maes G. 2012. Multi-marker estimate of genetic connectivity of sole (*Solea solea*) in the North-East Atlantic Ocean. *Marine Biology* 159(6):1239-53.

<sup>17</sup> Rochette S, Rivot E, Morin J, Mackinson S, Riou P, Le Pape O (2010) Effect of nursery habitat destruction on flatfish population renewal. Application to common sole (*Solea solea*, L.) in the Eastern Channel (Western Europe). *Journal of Sea Research* 64 : 34-44.

<sup>18</sup> Archambault B, Le Pape O, and Rivot E (2014) Density dependence can be revealed by modeling the variance in the stock-recruitment process. An application to flatfishes. *ICES Journal of Marine Sciences*, 71(8), 2127-2140.

<sup>19</sup> OBSMER (2013) Observations à bord des navires de pêche professionnelle. Bilan de l'échantillonnage 2012, 368p.

heurt à l'absence d'une géolocalisation de l'ensemble des activités et d'une quantification des captures réalisées sur les zones de nourriceries. Dans ce projet, la valorisation des données issues de l'obligation d'équipement en VMS des bateaux ciblant la sole (plan de gestion) devrait permettre d'affiner la connaissance de la structure spatiale des captures.

Même si les fileyeurs semblent beaucoup plus sélectifs avec des taux de rejets inférieurs à 5% (2.2% en 2012, OBSMER, 2013), une question subsiste sur la valorisation économique de la plus petite catégorie commerciale (variation importante du prix au kilo entre cette catégorie et les autres).

Si des études de sélectivité sur les chaluts capturant la sole existent (Mortreux, 2001<sup>20</sup>, Vieira et al, 2010<sup>21</sup>, Leonardi, 2009<sup>22</sup>, Weiller et al, 2014<sup>23</sup>), il est plus difficile d'avoir une idée de la sélectivité des filets utilisés et de la structure en taille des individus capturés par ceux-ci (Madsen et al. 1999<sup>24</sup>, Erzini, 2006<sup>25</sup>, Hovgard and Lewy, 1996<sup>26</sup>). En outre, l'influence de la nature du matériau de la nappe interne (« flue »), en mono ou multi-filaments, sur la sélectivité des trémails à sole, n'a jamais été étudiée. Les pêcheurs les utilisant affirment pourtant que des différences existent. Ces études de sélectivité et de diagramme d'exploitation sont essentielles pour anticiper l'effet de mesures de gestion relative à des augmentations de maillage et de type de matériaux utilisés.

Enfin les diagrammes d'exploitation spatio-temporels en fonction des engins utilisés permettraient de mieux comprendre l'exploitation de ce stock et de donner des pistes de valorisation des opportunités de captures sur une espèce telle que la Sole qui présente une très forte variabilité de prix en fonction des gammes de taille débarquées.

### Description des méthodes scientifiques développées et/ou utilisées dans le projet

#### 1. Analyse de la connectivité

##### 1.1 Marquage

Des campagnes de marquage de sole en Manche Est seront mises en œuvre afin d'estimer les taux d'échange et de ségrégation entre différentes sous entités potentielles de ce stock, ainsi qu'avec les stocks adjacents, et notamment celui de mer du Nord.

L'analyse des données de marquage-recapture permet d'analyser la variabilité interindividuelle des traits de vie comme la mortalité, la croissance, ou les déplacements (Seber, 1982<sup>27</sup>; Gimenez et al., 2007<sup>28</sup>). De nombreux exemples de la littérature halieutique montrent l'intérêt d'analyser les données de marquage-recapture pour estimer les taux de croissance, de mortalité ou de dispersion pour des espèces de poissons exploitées (Polacheck et al., 2010<sup>29</sup>; Sippel et al., 2014<sup>30</sup>; Dortel et al., 2015<sup>31</sup>; Goethel et al. 2015<sup>32</sup>). Les outils de modélisation intégrée offrent

<sup>20</sup> MORTREUX S., 2001. SAUPLIMOR : Rapport de Synthèse. Ifremer.

<sup>21</sup> Viera A., Meillat M., Coppin F., Delpech J-P., Morandeau F., Le Garrec A., 2010.

SELECCAB – Volet Hauturiers - Amélioration de la sélectivité des chalutiers hauturiers travaillant en Mer du Nord de façon à limiter les captures de cabillaud, 25+14 pp. ET Viera A., Meillat M., Coppin F., Delpech J-P., Morandeau F., Gamblin C., 2010. SELECCAB – Volet Artisans - Amélioration de la sélectivité des chalutiers artisanaux travaillant en Manche - Mer du Nord de façon à limiter les captures de cabillaud., 61 + 48pp.

<sup>22</sup> LEONARDI S., 2009. SELECMER : Amélioration de la sélectivité des chalutiers Pêche multispécifique – Manche - Mer du Nord. Comité National des Pêches Maritimes et des Elevages Marins Nord Pas de Calais / Picardie. Rapport d'étude, 118p.

<sup>23</sup> WEILLER Y.(1), REECHT, Y.(2), VERMARD (2), Y., COPPIN, F.(2), DELPECH, J.P.(2), MORANDEAU, F.(3), 2014. SELECFISH : Amélioration de la sélectivité des chalutiers de Manche est - Mer du Nord afin de limiter leurs rejets. (1) Comité Régional des Pêches Maritimes et des Elevages Marins Nord-Pas de Calais/Picardie, (2) IFREMER Boulogne, (3) IFREMER Lorient, 82 + 55pp.

<sup>24</sup> Madsen N, Holst R, Wileman D, Moth-Poulsen T (1999) Size selectivity of sole gill nets fished in the North Sea. Fisheries Research 44 : 59-73

<sup>25</sup> Erzini K, Goncalves JMS, Bentes L et al (2006) Size selectivity of trammel nets in southern European small-scale fisheries. Fisheries Research 79 : 183-201.

<sup>26</sup> Hovgard H, Lewy P (1996) Selectivity of gillnets in the North Sea, English Channel and Bay of Biscay. DFO-Rapport nr. 26-96.

<sup>27</sup> Seber, G. A. F. (1982). The estimation of animal abundance and related parameters (2nd ed.). New York, USA: Macmillan.

<sup>28</sup> Gimenez, O., Rossi, V., Choquet, R., Dehaes, C., Doris, B., Varella, H., ... Pradel, R. (2007). State-space modelling of data on marked individuals. Ecological Modelling, 206(3-4), 431-438.

<sup>29</sup> Polacheck, T., Paige Eveson, J., & Laslett, G. M. (2010). Classifying tagging experiments for commercial fisheries into three fundamental types based on design, data requirements and estimable population parameters. Fish and Fisheries, 11(2), 133-148.

<sup>30</sup> Sippel, T., Paige Eveson, J., Galuardi, B., Lam, C., Hoyle, S., Maunder, M., Nicol, S. (2014). Using movement data from electronic tags in fisheries stock assessment: A review of models, technology and experimental design. Fisheries Research, 163, 152-160.

<sup>31</sup> Dortel, E., Sardenne, F., Bousquet, N., Rivot, E., Million, J., Le Croizier, G., & Chassot, E. (2015). An integrated Bayesian modeling approach for the growth of Indian Ocean yellowfin tuna. Fisheries Research, 163, 69-84.

<sup>32</sup> Goethel, D. R., Legault, C. M., & Cadrin, S. X. (2015). Demonstration of a spatially explicit, tag-integrated stock assessment model with application to three interconnected stocks of yellowtail flounder off of New England. ICES Journal of Marine Science: Journal Du Conseil, 72(1), 164-177.

aujourd'hui la possibilité d'intégrer directement l'analyse des données de marquage-recapture au sein des modèles de dynamique de population construits pour l'évaluation des stocks, afin de pouvoir estimer simultanément les paramètres démographiques classiquement estimés (taux de mortalité par pêche, reconstruction des abondances et du recrutement) ainsi que les paramètres de dispersion entre plusieurs entités spatiales (Cunningham et al., 2007<sup>33</sup>; Lee et al., 2011<sup>34</sup>; Eveson et al., 2012<sup>35</sup>; Hendrix et al., 2012<sup>36</sup>; Hulson et al., 2013<sup>37</sup>; Sippel et al., 2014; Goethel et al. 2015).

Ce projet permettra de mettre en œuvre deux campagnes de marquage annuelles (première année et deuxième année du projet) et de mettre en place la procédure de collecte des poissons marqués et recapturés par les professionnels. Le marquage utilisera des marques passives à lecture externe. Les opérations de marquage devront porter sur les principales classes d'âge exploitées (idéalement âges 2-6), et devront couvrir l'ensemble des zones de frayères connues de Manche Est. La collecte des données de recapture par les professionnels devra idéalement couvrir la plus grande surface possible de façon à maximiser l'étendue spatiale des dispersions qu'il sera possible d'estimer.

Les données de marquage recapture seront analysées au travers de modèles intégrés (Eveson et al., 2012; Hendrix et al., 2012; Hulson et al., 2013; Sippel et al., 2014; Goethel et al. 2015) permettant de valoriser conjointement les données classiquement utilisées dans les modèles d'évaluation (matrice de captures aux âges, et indices d'abondance) et les données de marquage recapture, afin d'intégrer explicitement la dispersion dans le modèle de dynamique de population.

Le couplage avec les approches de modélisation sera réalisé en deux phases successives:

- Dans un premier temps, une approche basée sur des données simulées sera mise en œuvre pour optimiser le protocole de marquage (nombre de marques posées, répartition spatiale des marquages). Les critères d'optimisation porteront sur les possibilités d'estimer les flux entre différentes entités spatiales (sous-populations).
- Dans un deuxième temps, les données de marquage-recaptures seront analysées de façon à estimer les taux d'échange entre les sous-populations constituant le stock de Manche Est. In fine, les résultats seront intégrés dans un modèle de dynamique de population spatialisé pour le stock de Sole de Manche Est.

### 1.2 Morphométrie des otolithes

La forme des otolithes est déterminée à la fois par des facteurs génétiques (génotype, Campana et Casselman 1993<sup>38</sup>) et l'influence de l'environnement (phénotype, Cardinale et al. 2004<sup>39</sup>). L'analyse de forme des otolithes peut donc permettre de distinguer les stocks, mais aussi, avec un échantillonnage plus fin, d'identifier au sein d'un stock, de potentielles sous-populations, occupant des régions distinctes. Cette méthode consiste à décrire le contour de l'otolithe sous la forme d'une fonction mathématique; chaque otolithe se distinguant par la valeur des paramètres de cette fonction (Lestrel, 2008<sup>40</sup>). Avec la matrice de données ainsi obtenue, des analyses discriminantes seront utilisées pour expliquer et prédire l'appartenance à des groupes prédéfinis (zones géographiques) d'un ensemble d'observations (individus) à partir d'une série de variables prédictives (coefficients de Fourier). La qualité de la discrimination et le taux de reclassement des individus dans les groupes prédéfinis permettront de distinguer ou non différentes populations.

### 1.3 Microchimie des otolithes

La signature chimique des otolithes sera utilisée comme support d'information pour caractériser la structuration

<sup>33</sup> Cunningham, C., Reid, D., McAllister, M., Kirkwood, G., & Darby, C. (2007). A Bayesian state-space model for mixed-stock migrations, with application to Northeast Atlantic mackerel *Scomber scombrus*. *African Journal of Marine Science*, 29(3), 347–367.

<sup>34</sup> Lee, H.-H., Maunder, M. N., Piner, K. R., & Methot, R. D. (2011). Estimating natural mortality within a fisheries stock assessment model: An evaluation using simulation analysis based on twelve stock assessments. *Fisheries Research*, 109(1), 89–94.

<sup>35</sup> Eveson, J. P., Basson, M., & Hobday, A. J. (2012). Using electronic tag data to improve mortality and movement estimates in a tag-based spatial fisheries assessment model. *Canadian Journal of Fisheries and Aquatic Sciences*, 69(5), 869–883.

<sup>36</sup> Hendrix, A. N., Straley, J., Gabriele, C. M., & Gende, S. M. (2012). Bayesian estimation of humpback whale (*Megaptera novaeangliae*) population abundance and movement patterns in southeastern Alaska. *Canadian Journal of Fisheries and Aquatic Sciences*, 69(11), 1783–1797.

<sup>37</sup> Hulson, P.-J. F., Quinn, T. J., Hanselman, D. H., & Ianelli, J. N. (2013). Spatial modeling of Bering Sea walleye pollock with integrated age-structured assessment models in a changing environment. *Canadian Journal of Fisheries and Aquatic Sciences*, 70(9), 1402–1416.

<sup>38</sup> Campana, S.E., and Casselman, J.M. 1993. Stock discrimination using otolith shape analysis. *Can. J. Fish. Aquat. Sci.* 50: 1062–1083. doi:10.1139/f93-123.

<sup>39</sup> Cardinale, M., Doerin-Arjes, P., Kastowsky, M., and Mosegaard, H. 2004. Effects of sex, stock, and environment on the shape of known-age Atlantic cod (*Gadus morhua*) otoliths. *Can. J. Fish. Aquat. Sci.* 61: 158–167. doi:10.1139/F03-151.

<sup>40</sup> Lestrel, P.E. 2008. Fourier Descriptors and their Applications in Biology. Cambridge University Press, Cambridge.

spatiale et le réseau de connectivité de la sole entre ses différents stades de vie sur la Manche-Est. Le principe méthodologique repose sur le transfert des éléments traces de l'environnement dans la matrice protéocalcique de l'otolithe de manière chronologique et pérenne (Campana 1999<sup>41</sup>, Thorrold et al. 2002<sup>42</sup>, 2007<sup>43</sup>, Chittaro et Hogan 2013<sup>44</sup>). Le procédé se décompose en deux temps : 1- construire un référentiel géolocalisé des signatures chimiques des habitats essentiels (signatures des frayères et des nourriceries référencées), 2- rechercher dans les otolithes des individus collectés aux stades d'intérêt (juvéniles, adultes) des correspondances de signature avec ce référentiel. Le référentiel frayères sera élaboré à partir d'échantillons d'eau et d'otolithes de larves prélevés sur ou à proximité des frayères ciblées (Baie de Seine, zone des trois estuaires et Dunkerquois). Le référentiel nourriceries sera constitué à partir d'échantillons d'eau et d'otolithes de juvéniles prélevés sur 5 nourriceries d'intérêt. La frayère de provenance des juvéniles et des adultes collectés sera alors recherchée en comparant les signatures chimiques déposées dans leurs otolithes pendant la phase larvaire, au référentiel frayères. Sur le même principe, la nourricerie de provenance des adultes sera recherchée en comparant la signature déposée dans leurs otolithes pendant la phase juvénile au référentiel nourricerie.

## 2. Modèles de dynamique de population de la sole de Manche Est :

Une démarche de modélisation sera mise en œuvre pour intégrer l'ensemble des données déjà disponibles ainsi que l'information recueillie au cours du projet sur la biologie du stock de sole de Manche Est, sa dynamique et son exploitation, et pour étudier l'impact de la prise en compte de ces nouvelles connaissances sur la dynamique de la sole. La démarche de modélisation comprendra trois axes complémentaires :

- (1) Le modèle actuellement utilisé (modèle XSA : « Exploratory Extended Survivors Analysis ») pour l'évaluation au sein du groupe WGNSSK du CIEM sera actualisé avec les nouvelles données ;
- (2) En s'appuyant sur les travaux de modélisation de la dynamique de population déjà réalisés sur ce stock (Rochette et al., 2013 et références associées), un modèle de population intégré sera développé dans un cadre statistique Bayésien, afin d'intégrer de l'ensemble des données disponibles pour représenter la dynamique du stock de Manche Est dans un cadre spatialement explicite. Ce modèle de cycle de vie devrait intégrer l'ensemble des phases du cycle de vie : la ponte, la dérive larvaire, la vie juvénile et la phase adulte. Il permettra d'estimer simultanément les paramètres démographiques classiquement estimés (taux de mortalité par pêche, reconstruction des abondances et du recrutement) ainsi que les paramètres de dispersion entre plusieurs entités spatiales. Le cadre d'inférence Bayésien permettra de valoriser les données disponibles pour estimer les principaux paramètres dans un cadre probabiliste adapté pour la quantification des incertitudes et l'analyse des risques (Punt et Hilborn, 1997<sup>45</sup>). Ce modèle permettra aussi de simuler des scénarios sur la dynamique de ce stock de sole en intégrant différentes mesures de gestion, allant de la préservation-réhabilitation des nourriceries côtières et estuariennes jusqu'à la gestion spatialisée de la mortalité par pêche sur la fraction adulte pour adapter les prélèvements à la productivité locales des sous-entités composant le stock de Manche Est.
- (3) Enfin, la plateforme ISIS-Fish (Pelletier et al, 2009<sup>46</sup>, isis-fish.org) pourra ensuite être mobilisée pour tester les performances relatives de diverses stratégies de gestion de la pêche spatialisées. Il s'agit d'une plateforme de simulation bio-économique permettant la description spatialisée de la dynamique des populations ainsi que de l'activité de pêche avec en particulier la description explicite de la sélectivité. Une application a été développée pour les pêcheries démersales de Manche est, incluant la majorité des flottilles ciblant la sole (Lehuta et al. 2015<sup>47</sup>). Il décrit la dynamique spatio-temporelle de la population de sole à partir des stades recrutés sur la base des hypothèses du modèle CIEM avec un pas de temps mensuel.

<sup>41</sup> Campana, S.E. (1999). Chemistry and composition of fish otoliths: pathways, mechanisms and applications. Marine Ecology Progress Series 188, 263-297.

<sup>42</sup> Thorrold, S.R., Jones, G.P., Hellberg, M.E., Burton, R.S., Swearer, S.E., Neigel, J.E., Morgan, S.G. and Warner, R.R. (2002). Quantifying larval retention and connectivity in marine populations with artificial and natural markers. Bulletin of Marine Science 70, 291-308.

<sup>43</sup> Thorrold, S.R., Zacherl, D.C. and Levin, L.A. (2007). Population connectivity and larval dispersal using geochemical signatures in calcified structures. Oceanography 20, 80-89.

<sup>44</sup> Chittaro, P.M. and Hogan, J.D. (2013). Patterns of connectivity among populations of coral reef fish. Coral Reefs 2, 341-354.

<sup>45</sup> Punt, A. E., & Hilborn, R. (1997). Fisheries stock assessment and decision analysis: the Bayesian approach. Reviews in Fish Biology and Fisheries, 7, 35-63.

<sup>46</sup> Pelletier Dominique, Mahevas Stephanie, Drouineau Hilaire, Vermard Youen, Thebaud Olivier, Guyader Olivier, Poussind Benjamin (2009). Evaluation of the bioeconomic sustainability of multi-species multi-fleet fisheries under a wide range of policy options using ISIS-Fish. Ecological Modelling, 220(7), 1013-1033.

<sup>47</sup> Sigrid Lehuta, Youen Vermard and Paul Marchal (2015) A spatial model of the mixed demersal fisheries in the Eastern Channel, in Marine Productivity: Perturbations and Resilience of Socio-ecosystem, Proc. 15th French-Japan. Oceanogr. Symposium, H.-J. Ceccaldi et al. (eds.), p187-195.

#### Description des aspects novateurs du projet

Outre les différentes techniques novatrices (e.g. otolithométrie, modélisation, sélectivité des filets en fonction du matériau) présentées ci-avant, ce projet aura pour intérêt de coupler ces différentes approches au sein d'un projet intégré afin de répondre au questionnement des acteurs de cette pêcherie. Les approches qui seront couplées dans ce projet portent sur l'ensemble du cycle de vie de la sole. Elles permettront :

- D'analyser la structure spatiale du stock de sole de Manche Est en tenant compte des différentes phases (larves et adultes) auxquelles les échanges et mouvement peuvent se produire ;
- D'intégrer l'ensemble des pressions affectant ce stock (pressions sur les habitats du fait de la dégradation liée aux activités humaines, pêche) ;
- D'envisager les opportunités de nouvelles méthodes de gestion de l'exploitation de cette ressource (anticipation du recrutement, spatialisation de la pression de pêche, amélioration de la sélectivité).

Seule une approche intégrée comme celle proposée ici permet d'exploiter des travaux scientifiques dans une approche opérationnelle. L'association, sur les différentes phases du projet, des professionnels de la pêche et des scientifiques et l'intégration de leur connaissance experte sera de plus un gage de succès et de transfert des acquis.

## RESULTATS ATTENDUS DU PROJET (1 PAGE)

#### Description des principaux résultats attendus

- Caractérisation du mouvement des adultes dans le 7D et avec les zones adjacentes ; de la contribution des différentes frayères et nourriceries au stock, conséquences sur la dynamique du stock et de son exploitation.
- Variabilité spatio-temporelle des densités de juvéniles sur 2 ans, et lien sur 1 an avec larves. Distribution spatiale et saisonnière des frayères et des zones de dérive larvaire et comparaison avec les données antérieures. Protocoles d'estimation du recrutement dans le cadre d'une nouvelle campagne recrutement.
- Amélioration de la connaissance sur la structure et la dynamique spatiale du stock de sole de Manche Est en interaction avec les variations environnementales et la dynamique de la pêcherie.
- Profils de sélectivité des filets existants, et d'engins alternatifs.
- Meilleure compréhension des stratégies de pêche par régions, et variation spatio-temporelle des captures et rejets de soles, proposition de mesures de gestion efficaces.

#### Bénéfices du projet d'un point de vue professionnel et scientifique à court (issue du projet), moyen (quelques mois) et long terme (plusieurs années) après la période de réalisation du projet

A court terme, le projet permettra de rassembler les scientifiques, les professionnels et leurs représentants autour de travaux communs, de partager les connaissances disponibles et d'optimiser l'acquisition de nouvelles données.

A moyen terme, les connaissances acquises (en particulier sur la structure spatiale du stock de sole de Manche Est ainsi que sur les diagrammes d'exploitation et la sélectivité des engins) permettront de tester de potentielles mesures de gestion spatio-temporelles avec plus de certitude que par le passé.

A long terme, les connaissances acquises au cours de ce projet seront valorisées dans le cadre de l'évaluation annuelle du stock de sole Manche Est au groupe WGNSSK du CIEM (identité du stock, diagramme d'exploitation) et un indice supplémentaire sera disponible pour évaluer le recrutement, si toutefois nous parvenons à assurer financièrement la pérennité de la campagne conjointe.

## STRATEGIE DE VALORISATION ET DE COMMUNICATION

Au niveau de la filière pêche

*Précisez le type de valorisation (données, résultats...) et de communication (presse, support médias...)*

Les représentants des professionnels participant au projet communiqueront autour du projet, et en particulier des ateliers scientifiques-professionnels et des campagnes auprès de leurs adhérents.  
Une campagne de communication sur le projet sera organisée auprès des professionnels français mais aussi anglais, belges et hollandais. Les travaux de marquage seront en particulier présentés, de manière à optimiser le retour des soles marquées.  
Des communiqués de presse seront produits pour diffuser les temps forts du projet et les résultats obtenus à destination de la presse spécialisée.

Au niveau scientifique

*Précisez le type de valorisation (données, résultats, publications...) et de communication (presse, colloque...)*

Les résultats de ce projet seront validés dans le cadre du groupe de travail WGNSSK du CIEM. Ils feront également l'objet de publications dans des journaux scientifiques de rang A, et de colloques nationaux et internationaux.

Au niveau du grand public (éventuellement)

Des communiqués de presse seront produits pour diffuser les temps forts du projet et les résultats obtenus à destination de la presse spécialisée.

## ACCORDS ENTRE LES PARTENAIRES

UN OU DES PARTENARIAT SONT ILS PREVUS ?

OUI ☒ NON ☐

Description globale de cet ou de ces accords

*Propriété intellectuelle, industrielles, partage des données, brevets...*

Les données brutes collectées au cours du projet sont la propriété de l'ensemble des partenaires du projet. Néanmoins, tout usage, par un partenaire, autre que celui prévu dans le cadre de ce projet devra faire l'objet d'une information auprès des autres partenaires. Quoiqu'il en soit, les données individuelles ne pourront être diffusées à l'extérieur que sous forme agrégée. Une convention entre les partenaires peut être envisagée pour préciser ces points.

## PLANIFICATION DU PROJET

N° phase	Nom de la phase	Planification																																						
		2015				2016				2017				2018																										
		dec	janv.	fev.	mars	avrèl	mai	juin	juil.	août	sept.	oct.	nov.	déc.	janv.	fev.	mars	avrèl	mai	juin	juil.	août	sept.	oct.	nov.	déc.	janv.	fev.	mars	avrèl	mai	juin	juil.	août	sept.	oct.	nov.			
1	Marquage																																							
	Morphométrie des otolithes (prélèvements et analyse labo)																																							
	Microchimie des otolithes (prélèvements et analyse labo)																																							
	Analyse et modélisation																																							
2	Ateliers et préparation des campagnes																																							
	Campagnes																																							
	Analyse labo oeufs et larves																																							
	Analyses et Modélisation																																							
3	Préparation et Ateliers																																							
	Campagnes en mer																																							
	Essais bassins																																							
	Analyse et modélisation																																							

## ORGANISATION DU PROJET : DESCRIPTION DES PHASES

### PHASE 1 : CONNECTIVITE

Objectif général de la phase : Caractériser la structure spatiale des populations et leur connectivité

Partenaires impliqués : Agrocampus Ouest, CME, CRPM Nord Pas de Calais-Picardie, Haute Normandie, Basse Normandie, FromNord, IFREMER, OPBN

#### Description détaillée de la phase :

Trois techniques seront utilisées de manière à répondre aux questions suivantes : (a) Quelles sont les frayères et les nurseries de provenance des adultes capturés en Manche Est, comment les nurseries côtières alimentent-elles le stock (b) Quels sont les mouvements des adultes (1) intra Manche Est, et (2) avec la Manche Ouest et le sud Mer du Nord ?

#### 1. Le marquage

Deux campagnes de marquage (1ère année et 2e année du projet) seront organisées. Le marquage utilisera des marques passives à lecture externe (de type T-bar), et sera réalisé à bord des bateaux professionnels par des agents IFREMER et Agrocampus Ouest, avec le soutien technique des équipages, selon un calendrier mis au point par l'ensemble des partenaires. Les opérations de marquage devront porter sur les principales classes d'âge exploitées, et devront couvrir l'ensemble des zones de frayères connues de Manche Est.

Le plan d'échantillonnage sera défini à l'aide entre autres du modèle bayésien de dynamique de population développé à Agrocampus Ouest (Rochette et al., 2013), dans le cadre d'un stage de M2 et d'un post-doctorat (prévus dans la présente demande) tous deux encadrés conjointement par Agrocampus Ouest et IFREMER.

La collecte des données de recapture par les professionnels devra idéalement couvrir la plus grande surface possible de façon à maximiser l'étendue spatiale des dispersions. C'est pourquoi l'ensemble des flottilles pêchant la sole en Manche et sud Mer du Nord seront mobilisées pour la recapture au moyen d'une campagne de communication réalisée par l'ensemble des partenaires. Les résultats seront analysés dans le cadre du post-doctorat précédemment mentionné.

#### 2. Morphométrie des otolithes

Des otolithes seront prélevés sur des soles fournies par les professionnels lors des 4 trimestres de l'année 2016 selon un plan d'échantillonnage spatial préalablement défini (entre 50 et 100 adultes par site de prélèvement). Ces prélèvements auront lieu aux laboratoires Ifremer de Port en Bessin et de Boulogne sur mer et seront complétés par des mesures biologiques complémentaires (portant notamment sur la maturité sexuelle).

En 2017, les otolithes collectés feront l'objet d'une analyse numérique à l'aide du logiciel TNPC (Traitement Numérique des Pièces Calcifiées, <http://www.tnpc.fr/fr/tnpc.html>) développé par l'IFREMER. A partir de ces images, les formes des otolithes seront extraites selon l'analyse elliptique de Fourier, puis les données seront analysées par région.

#### 3. Microchimie des otolithes

Des otolithes seront prélevés sur des soles adultes (en 2016 et 2017), sur des juvéniles prélevés au cours des campagnes d'études du recrutement (cf. phase 2), et sur des larves collectées au cours de la campagne d'évaluation des abondances larvaires. Le « référentiel frayères » (cf. section « Description des méthodes scientifiques ») sera formé sur une année de collecte. Chacune des 3 zones de frai sera échantillonnée à 2 moments de la saison de ponte (3 échantillons d'eau et 10 à chaque fois). Le « référentiel nurseries » sera constitué sur 2 années de collecte à partir de juvéniles de l'année et de l'année précédente (10 juvéniles, 3 échantillons d'eau sur 3 sites de chacune des 5 nurseries ciblées sur les 2 ans). La composition chimique en éléments majeurs, mineurs et traces des échantillons d'eau et des otolithes sera ensuite analysée par ICP-MS (inductively coupled plasma mass spectrometer) et Laser-ICP-MS respectivement. Le post-doctorant recruté sur cette question aura en charge de coordonner et de participer aux collectes puis de réaliser les analyses et le traitement des résultats.

Les modèles spatialisés (présentés dans la section « Description des méthodes scientifiques ») permettront, en intégrant les informations issues des travaux listés précédemment, d'analyser les conséquences de la structure spatiale (i.e., ségrégation du stock de manche Est en entités séparées, échanges avec la mer du Nord) sur la dynamique de population.

## Phase 2:

Objectif général de la phase : Améliorer les connaissances sur la variabilité spatio-temporelle du larvaires et de juvéniles de la sole et mettre en place une campagne conjointe (professionnels- scientifiques) d'évaluation du recrutement

Partenaires impliqués : Agrocampus Ouest, CME, CRPM Nord Pas de Calais-Picardie, Haute Normandie, Basse Normandie, FromNord, IFREMER, OPBN

### Description détaillée de la phase :

Les travaux antérieurs de modélisation des habitats de juvéniles de sole en Manche Est (Riou et al., 2001 ; Rochette et al., 2010) seront exploités. Ces travaux ont permis de centraliser l'intégralité des données disponibles portant sur l'évaluation des abondances de ces juvéniles dans les secteurs côtiers et estuariens où ils se concentrent, lors de campagnes scientifiques menées sur les côtes françaises et anglaises, le plus souvent à bord de navires professionnels côtiers. En utilisant ces données pour modéliser la répartition spatiale des soles nées dans l'année (Rochette et al., 2010) et des juvéniles âgés de un an (Riou et al., 2001) à partir des caractéristiques de l'habitat, ces approches ont permis de disposer de deux types d'information : une cartographie quantitative de la répartition de ces juvéniles et des indices d'abondance annuels. L'utilisation, après réactualisation, de ces séries historiques de plus de trois décennies permettra d'analyser l'asynchronisme des fluctuations du recrutement de la sole sur les différents secteurs de nurserie en Manche Est, en tenant compte de leur capacité respective (surface et qualité d'habitat issues de la cartographie quantitative). Ces analyses permettront d'argumenter l'optimisation de la localisation d'une nouvelle campagne d'estimation du recrutement pour compléter au mieux les données de la campagne scientifique annuelle en baie de Somme (Noursom) et affiner la prédiction du recrutement à venir.

Une revue des méthodes et protocoles d'estimation existante sera également réalisée et l'ensemble sera présenté au cours d'un atelier de discussion, scientifiques – professionnels, dont l'objectif sera de proposer une/des stratégie(s) d'évaluation à tester au cours du projet.

Les campagnes seront menées en Septembre-Octobre 2016 et 2017 sur des bateaux professionnels, et un protocole optimisé (scientifiquement et financièrement) sera proposé à l'issue du projet pour la mise en place d'une campagne sentinelle pérenne.

Parallèlement, une campagne océanographique d'échantillonnage des œufs et larves de sole sera organisée au printemps 2017 pendant le pic de reproduction de la sole au mois d'Avril et Mai. Cette campagne couvrira l'ensemble des côtes Françaises de la Manche Est depuis la Baie de Seine jusqu'à l'estuaire de l'Escaut afin de couvrir l'ensemble de la zone de reproduction. Elle visera à estimer les densités et la répartition des œufs et larves de poissons afin de localiser et cartographier les zones de frayères et de dérive larvaire. Les paramètres environnementaux (température, salinité, chlorophylle...) et le mésozooplancton seront également collectés afin de caractériser ces zones d'un point de vue hydrobiologique. L'identification et le dénombrement par stade des œufs et larves de sole collectées in situ le long des côtes françaises de la Manche Est seront réalisés sous loupe binoculaire au centre IFREMER de Boulogne sur Mer. Les données obtenues seront comparées aux données de larves antérieures de 1995 afin d'étudier l'évolution de l'activité des différentes zones. Ces données seront également comparées à la distribution des juvéniles estimées à l'automne suivant, ainsi qu'aux résultats d'un modèle de transport de larves de soles développé dans le cadre d'une collaboration IFREMER – Agrocampus (Rochette et al., 2012).

Enfin, une revue de l'évolution de la qualité des nurseries de soles de la Baie de Seine sera réalisée et complétée par les résultats de projets en cours qui seront jumelés au projet présenté ici.

### Phase 3 :

Objectif général de la phase : Evaluer et améliorer la sélectivité des flotilles ciblant la sole de Manche Est : aspects technologiques et stratégies de pêche

Partenaires impliqués : CME, CRPM Nord Pas de Calais-Picardie, Haute Normandie, Basse Normandie, FromNord, IFREMER, OPBN

#### Description détaillée de la phase :

##### Sélectivité et stratégies de pêche :

Les ateliers de discussions entre scientifiques et les professionnels des différentes régions permettront de détailler et spécifier les particularités de l'exploitation dans les différentes zones de Manche Est. Ces particularités seront mises en relation avec les diagrammes d'exploitations observés lors de différentes marées échantillonnées. Ces deux étapes permettront d'identifier les potentielles améliorations en termes de sélectivité et de valorisation des opportunités de capture qui pourraient être réalisées dans les différentes flotilles.

Des campagnes d'échantillonnage des captures (de type OBSMER : structure en taille des rejets et débarquements) seront menées en 2016 et 2017. Elles permettront de mieux caractériser la variabilité spatio-temporelle des captures de soles, et de tester les stratégies d'optimisation discutées au cours des ateliers.

##### Sélectivité et engins de pêche :

Un premier atelier permettra d'identifier les problèmes rencontrés et de discuter des améliorations possibles.

Les modifications proposées seront ensuite réalisées sur des prototypes de filets de 2m puis 4 m de long qui seront préparés et testés respectivement au bassin d'essai de Lorient puis une démonstration et un échange autour de ces prototypes aura lieu au bassin de Boulogne lors d'un second atelier.

Des tests pourront ensuite avoir lieu en mer. Il est proposé de réaliser 4 campagnes de 5 jours de pose de filets tests et témoin, deux en Normandie et deux en Nord Pas de Calais/Picardie. Dans les deux zones, il s'agirait de tester des trémails en mono et multi-monofilaments, actuellement utilisés par les professionnels, ainsi que de nouveaux montages/dispositifs (comme un trémail en mailles tournées à 90°). Ces dispositifs et les maillages à tester devront être validés et testés lors des ateliers avec les différents partenaires et en fonction de l'avancement de la réflexion sur un protocole détaillé. Les captures de soles et de plie seront échantillonnées, de nouveau selon un échantillonnage de type obsmer.

Le nouveau type de montage proposé, i.e. le montage à 90° des nappes de filets permettrait d'obtenir une ouverture des mailles beaucoup plus allongée horizontalement et serait donc susceptible de laisser échapper les petites plies et petites soles.

##### Intégration au modèle ISIS-Fish et évaluation d'impact à l'échelle de la pêcherie :

Les courbes de sélectivités estimées pour les nouveaux dispositifs sélectifs seront intégrées au modèle ISIS-Fish.

L'impact sur la dynamique du stock et le rendement de la pêche de ces dispositifs ainsi que de différents scénarios de gestion spatialisés sera évalué sous différentes hypothèses de structure spatiale de population et de recrutement.

## ANALYSE STRATEGIQUE DU PROJET

### SWOT

*Strength, Weakness, Opportunities, Threat*

**Forces, Faiblesses, Opportunités, Menaces**

FORCES	FAIBLESSES
<p>Collaboration scientifiques – professionnels Représentation de la profession dans le projet Expérience des équipes scientifiques participantes sur les thématiques abordées. Approche multidisciplinaire et intégrée</p>	<p>Le projet ne couvre que les flottilles françaises et leurs zones d'exploitation par les flottilles françaises.</p>
OPPORTUNITES	MENACES
<p>Nécessité de renforcer les connaissances sur ce stock pour améliorer sa gestion. Nécessité de renforcer la collaboration « scientifiques – professionnels » autour de ce stock</p>	<p>Résultats du projet dépendants d'un travail conséquent en mer, risques associés : manque d'opportunités d'embarquements pour le marquage, l'échantillonnage (mauvais temps, ...). Incertitude sur le taux de recaptures des soles marquées.</p>



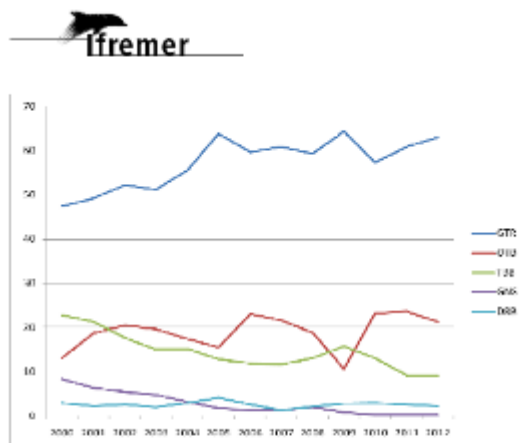


Figure 2 : Contribution des principaux engins aux débarquements français de sole en Manche Est (GTR=filets trémails, GNS=filets maillants, OTB=Chaluts de fond, DRB=dragues, TBB=code des chaluts à perche)

Voir plus de détail dans la réponse à la saisine 14-6732 (Biseau, 2014).



## 1. Détermination de la réduction de la mortalité par pêche nécessaire pour l'atteinte de l'objectif du Rendement Maximum Durable ( $F_{RMD}$ ) entre 2016 et 2020

### Données utilisées :

Les simulations ont été réalisées sur la base de l'évaluation 2014 du CIEM (WGNSSK-2014) et des hypothèses retenues par le CIEM pour les projections du stock et des captures. La mortalité par pêche en 2014 est supposée égale à la moyenne sur les trois années précédentes (2011-2013). Les simulations effectuées dans cette note débutant en 2016, il est considéré, pour 2015, que la mortalité par pêche soit au niveau permettant la consommation du TAC 2015. La mortalité par pêche ainsi supposée pour 2015 est de 0.55 (soit une augmentation de 28% par rapport à la moyenne 2011-2013)<sup>4</sup>.

Le recrutement est supposé constant sur l'ensemble de la période de la simulation et égal à la moyenne de la série historique (23.9 millions) lorsque la biomasse de reproducteur est supérieure à Bpa et décroît linéairement lorsque la biomasse de reproducteur est en dessous de ce seuil (dans ce cas  $R = 23.9 * B / Bpa$ ).

La mortalité par pêche  $F$  est la moyenne des mortalités sur les âges 3 à 8. La valeur de  $F_{RMD}$  est celle estimée par le CIEM en mars 2015 ( $F_{RMD} = 0.30$ ) (ICES, 2015).

Les simulations ne prennent pas en compte les incertitudes. Les résultats peuvent néanmoins être considérés comme une approximation de ce que seraient les valeurs de la médiane de simulations stochastiques.

### Résultats des simulations :

#### a) Atteinte progressive du $F_{RMD}$

Les figures 3 et 4 illustrent les principaux résultats des simulations selon que le  $F_{RMD}$  est atteint dès 2016, ou progressivement en 2017, 2018, 2019 ou 2020.

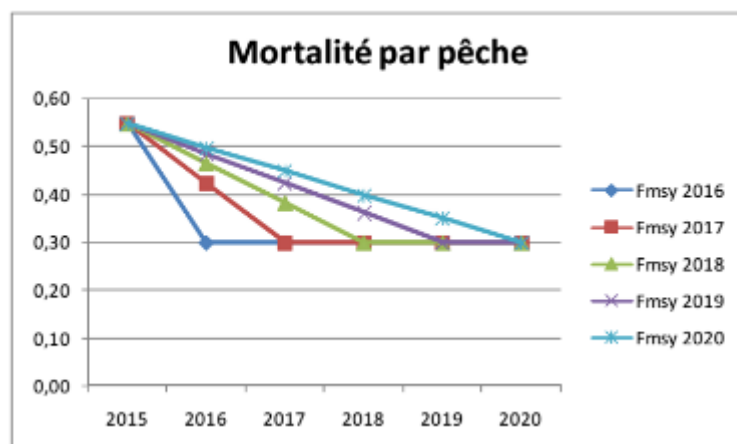


Figure 3. Sole de Manche Est - Evolution de la mortalité par pêche selon que le  $F_{RMD}$  est atteint en 2016, 2017, 2018, 2019 ou 2020.

L'atteinte du  $F_{RMD}$  en 2016 supposerait une réduction de la mortalité par pêche de 45% par rapport à la mortalité par pêche supposée en 2015, et de 31% par rapport à la mortalité moyenne 2011-2013 (0.43).

<sup>4</sup> Les possibles modifications du diagramme d'exploitation consécutives aux mesures de gestion n'ont pas été considérées dans ces simulations, leur effet réel n'étant pas quantifiable avant l'évaluation du stock de 2016.



Avec un objectif 2020 et sur la base d'une réduction progressive (à pas égaux), la mortalité par pêche en 2016 devrait être de 0.50, soit une baisse de 9% par rapport à la mortalité par pêche supposée en 2015, puis continuer de baisser d'un peu plus de 10% tous les ans jusqu'en 2020.

Si l'objectif d'atteinte du  $F_{RMD}$  est fixé entre les deux (2017-2019), la réduction de  $F$  en 2016 (par rapport au  $F$  supposé en 2015) serait respectivement de 22%, 15% et 11%

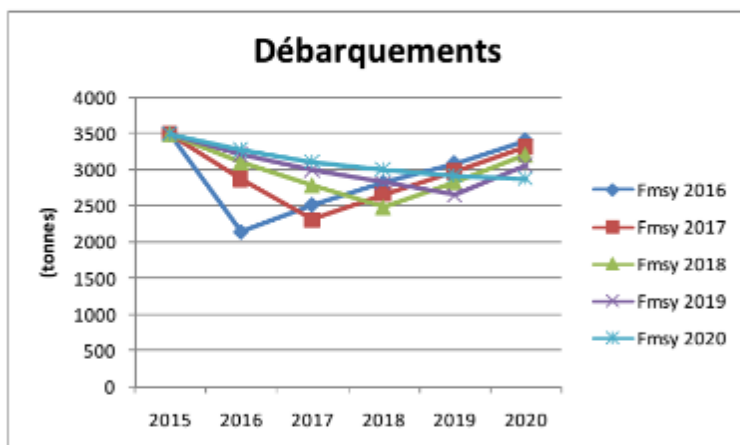


Figure 4 : Sole Manche Est - Débarquements estimés selon les mortalités par pêche correspondant respectivement à une stratégie d'atteinte de  $F_{RMD}$  en 2016, 2017, 2018, 2019 ou 2020.

Les débarquements prévus en 2016, selon la date d'atteinte de  $F_{RMD}$  (2016–2020), sont respectivement de 2136, 2866, 3092, 3202 et 3267 tonnes (tableau 2), soit une réduction par rapport au TAC 2015 variant de 39 à 6%.

Le tableau 2 donne la valeur des débarquements sur la période 2016-2020 selon différents scénarios (atteinte du RMD en 2016, ou progressivement en 2017, 2018 ou 2020).

	2016	2017	2018	2019	2020
Fmsy en 2016	2136	2508	2815	3084	3401
Fmsy en 2017	2866	2315	2665	2972	3312
Fmsy en 2018	3092	2780	2480	2828	3198
Fmsy en 2019	3202	2990	2816	1650	3054
Fmsy en 2020	3267	3110	2996	2913	2876

Tableau 2 : Sole Manche Est- Débarquements (TAC) 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$  (tonnes).

#### b) Atteinte progressive du $F_{RMD}$ et application de la règle de décision du CIEM (AR)

Lorsque, pour une année de la simulation, la biomasse féconde est estimée inférieure au seuil  $MSY-B_{trigger}$ , le CIEM applique une règle de précaution qui minore la valeur de  $F$  de cette année par le ratio  $SSB_{année}/MSY-B_{trigger}$ <sup>5</sup>.

Dans les simulations présentées ici, la biomasse de reproducteurs n'est inférieure à ce seuil qu'en 2016, et l'application de cette règle ne concerne que cette année, les autres valeurs de  $F$  étant inchangées (figure 5). La mortalité par pêche, en appliquant cette règle, est réduite de 8% supplémentaire.

<sup>5</sup> Cette règle est dénommée en anglais 'ICES Advice Rule', ou 'AR'

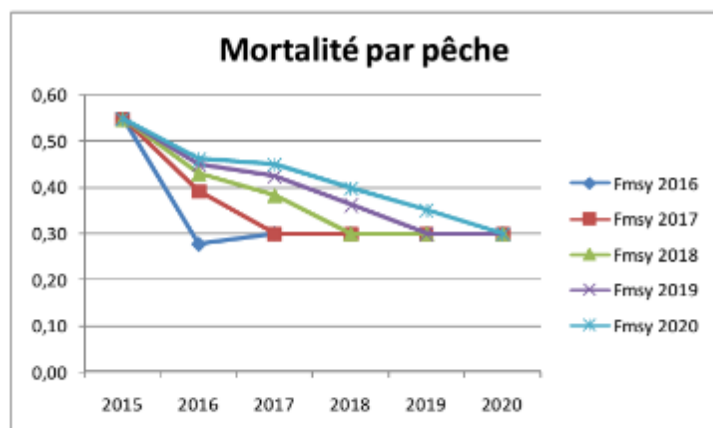


Figure 5 : Sole de Manche Est - Evolution de la mortalité par pêche selon que le  $F_{RMD}$  est atteint en 2016, 2017, 2018, 2019 ou 2020 et en appliquant la règle de précaution du CIEM.

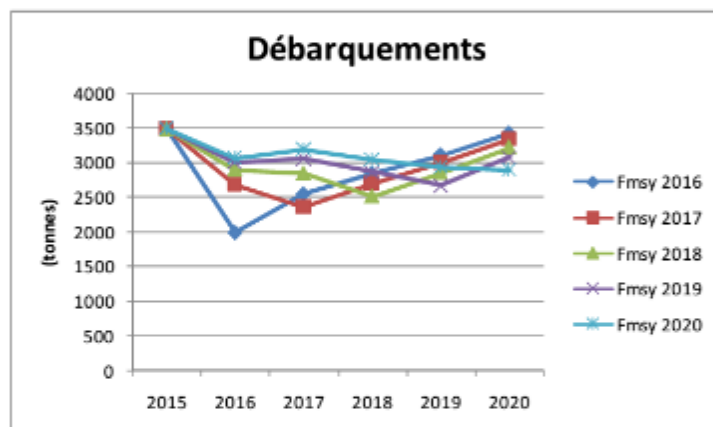


Figure 6 : Sole Manche Est - Débarquements estimés selon les mortalités par pêche correspondant respectivement à une stratégie d'atteinte de  $F_{RMD}$  en 2016, 2017, 2018, 2019 ou 2020 et en appliquant la règle de précaution du CIEM.

Les débarquements 2016 sont quant à eux réduits d'environ 6% supplémentaire. Les débarquements des années ultérieures sont également affectés<sup>6</sup>, mais légèrement, de l'ordre de 1 à 2%.

Le tableau 3 donne la valeur des débarquements sur la période 2016-2020 selon différents scénarios (atteinte du RMD en 2016, ou progressivement en 2017, 2018, 2019 ou 2020 et en appliquant la règle de précaution du CIEM).

	2016	2017	2018	2019	2020
Fmsy en 2016 (x ratio)	1994	2546	2844	3106	3418
Fmsy en 2017 (x ratio)	2684	2363	2702	3000	3334
Fmsy en 2018 (x ratio)	2899	2843	2516	2855	3219
Fmsy en 2019 (x ratio)	3004	3060	2858	2676	3074
Fmsy en 2020 (x ratio)	3066	3184	3042	2941	2895

Tableau 3 : Sole Manche Est- Débarquements (TAC) 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$  (tonnes) et en appliquant la règle de précaution du CIEM.

<sup>6</sup> Car même si la mortalité est inchangée pour ces années, le fait que la mortalité en 2016 soit plus faible conduit à une biomasse plus importante et permet donc, à mortalité égale, des débarquements plus élevés.



c) Atteinte progressive du  $F_{RMD}$  par TAC constant

Le maintien du TAC 2015 (3843 tonnes) jusqu'en 2020 conduirait à une légère diminution de la mortalité par pêche (la biomasse étant supposée augmenter légèrement), mais qui resterait très largement supérieure à  $F_{RMD}$  (0.47 en 2020) (Figure 7). L'atteinte de  $F_{RMD}$  fin 2017 supposerait, toutes choses étant égales par ailleurs, un TAC constant de 2450 tonnes en 2016 et 2017. Avec un objectif 2020, il faudrait un TAC constant de 3000 tonnes sur la période 2016-2020 (Figure 8 et tableau 4).

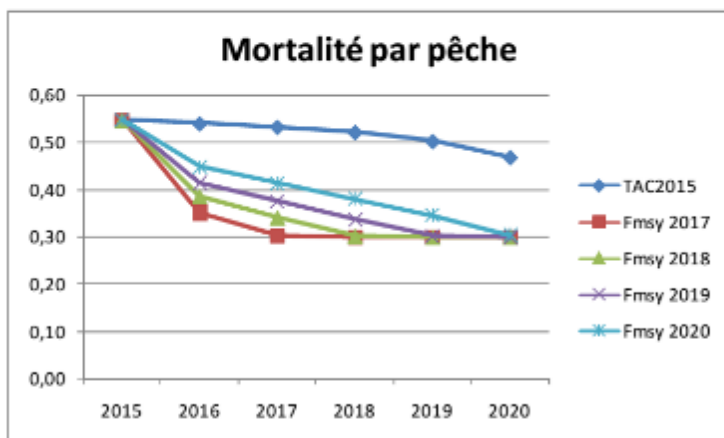


Figure 7. Sole de Manche Est – Evolution de la mortalité par pêche selon divers scénarios de TACs constants.

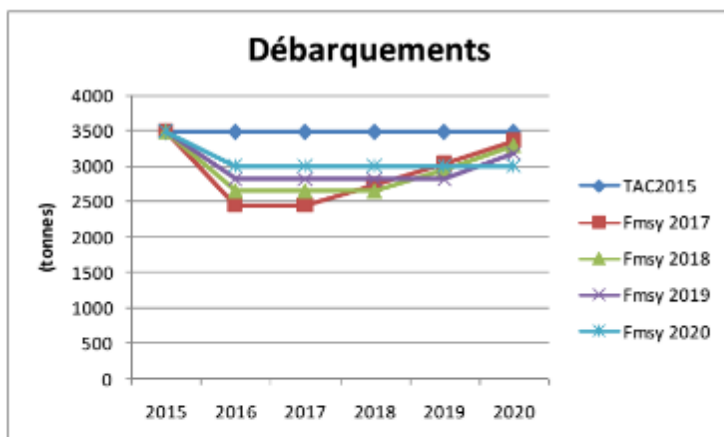


Figure 8. Sole de Manche Est – Scénarios de TACs constants jusqu'à l'atteinte du  $F_{RMD}$  en 2017, 2018, 2019 ou 2020.

	2016	2017	2018	2019	2020
Fmsy en 2017	2450	2450	2744	3031	3358
Fmsy en 2018	2650	2650	2650	2944	3289
Fmsy en 2019	2820	2820	2820	2820	3173
Fmsy en 2020	3000	3000	3000	3000	3000

Tableau 4 : Sole Manche Est- Débarquements (TAC) 2016-2020 permettant l'atteinte de  $F_{RMD}$  (tonnes).



d) Impact à long terme d'une pêche à  $F_{RMD}$

Comme le laissent supposer les graphiques précédents montrant l'évolution des débarquements, les gains espérés par une exploitation à  $F_{RMD}$  ne résident pas dans une augmentation des débarquements, mais bien dans une (très) forte augmentation, à terme, de la biomasse (+76%) (ce qui permet une atténuation des effets de la variabilité recrutement) et une forte augmentation de gros poissons dans le stock et dans les captures (gage d'un fort potentiel de reproduction et probablement d'une meilleure valorisation des captures). Le principal avantage (pour le pêcheur) réside dans la très forte augmentation des rendements des navires (permettant des débarquements identiques avec un effort de pêche réduit, donc des coûts réduits, conduisant à une augmentation des bénéfices de +85% à terme) (Figure 8) [voir également les réponses aux saisines DPMA 14-6732 et 14-7340].

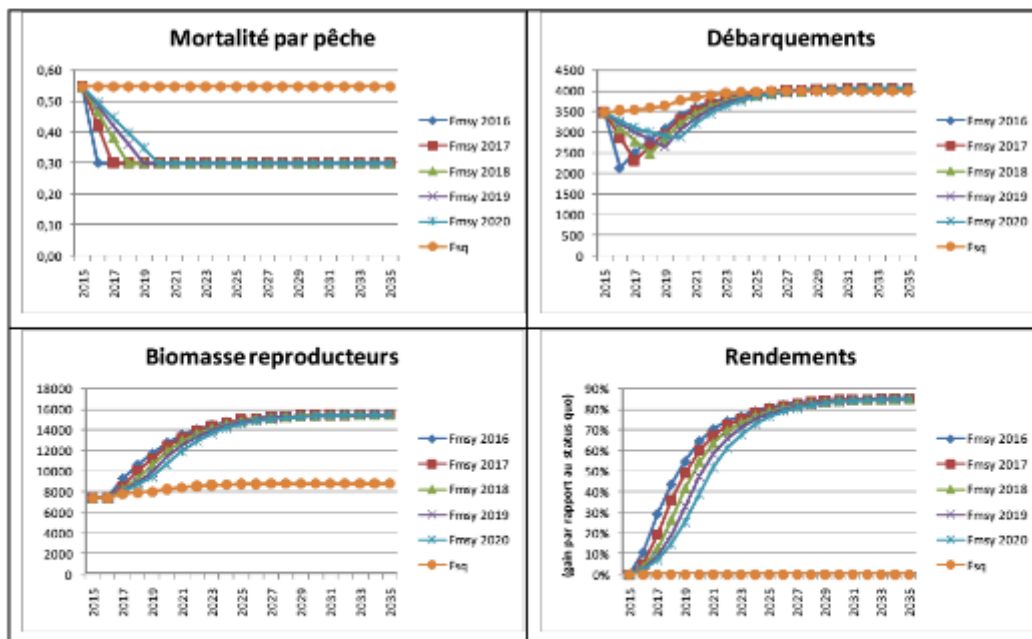


Figure 9. Sole de Manche Est – Evolution du stock, des débarquements et des rendements en fonction des scénarios permettant l'atteinte du  $F_{RMD}$  en 2017, 2018, 2019 ou 2020.

NB. La valeur absolue de tous ces résultats est conditionnée à la valeur réelle des recrutements (supposés ici quasi-constants) et des autres paramètres environnementaux influant la dynamique du stock (croissance, mortalité naturelle) ainsi qu'à l'hypothèse du maintien du diagramme d'exploitation (sélectivité) actuel.



## 2. Quantification de l'effort de pêche par métier en fonction des scénarios

La mortalité par pêche est proportionnelle à l'effort de pêche ; ainsi, toute baisse requise de mortalité par pêche nécessite une baisse équivalente de l'effort de pêche. Cette proportionnalité suppose que la capturabilité (combinaison de la vulnérabilité/accessibilité de l'espèce ciblée et de l'efficacité des engins) reste constante (c'est l'hypothèse la plus couramment utilisée).

L'hypothèse retenue ici est que le même pourcentage de variation s'applique à tous les métiers concernés (y compris étrangers).

Pour les navires français, le tableau 5 donne le nombre de navires par métier et classe de longueur titulaires d'une licence sole.

Flottille/Métier	Taille navire (m)	Nbe navires 2013	Nbe navires 2014
DRB_DES_>=80_0	10-12	45	38
GTR_DEF_100_119_0	10-12	13	10
GTR_DEF_90_99_0	10-12	156	156
OTB_DEF_70_99_0	10-12	161	181
TBB_DEF_70_99_0	10-12	33	35
DRB_DES_>=80_0	12-15	12	11
GTR_DEF_100_119_0	12-15	3	5
GTR_DEF_90_99_0	12-15	19	22
OTB_DEF_70_99_0	12-15	55	48
TBB_DEF_70_99_0	12-15	11	4
DRB_DES_>=80_0	15-18	6	7
GTR_DEF_100_119_0	15-18	1	2
GTR_DEF_90_99_0	15-18	14	12
OTB_DEF_70_99_0	15-18	66	56
TBB_DEF_70_99_0	15-18	11	9
GTR_DEF_100_119_0	18-24	4	4
GTR_DEF_90_99_0	18-24	0	1
OTB_DEF_70_99_0	18-24	80	76
OTB_DEF_70_99_0	24-40	19	16
TBB_DEF_70_99_0	24-40	2	2
DRB_DES_>=80_0	<10	12	8
GTR_DEF_100_119_0	<10	14	14
GTR_DEF_90_99_0	<10	28	21
OTB_DEF_70_99_0	<10	18	19
TBB_DEF_70_99_0	<10	5	5

Tableau 5 : nombre de navires titulaire d'une licence sole en 2015 par classe de longueur et métier (ciblant la sole) en 2013 et 2014. (NB. Un navire peut être compté plusieurs fois s'il a utilisé plusieurs engins au cours de l'année).



Le tableau 6 donne les débarquements en sole provenant de Manche Est des différentes flottilles/métiers et leur contribution moyenne aux débarquements internationaux de ce stock. La dernière colonne indique le nombre de jours de mer de ces métiers (moyenne 2013-2014).

Métier	Débarquements 2013 (tonnes)	Débarquements 2014 (tonnes)	Contribution moyenne	Effort (moyenne 2013-2014) (jours)
GTR_DEF_90_99_0	1 133	946	23.2%	6962
OTB_DEF_70_99_0	384	307	7.7%	13474
DRB_DES_>=80_0	217	170	4.3%	1591
OTH	129	151	3.1%	32143
GTR_DEF_100_119_0	76	96	1.9%	620.5
TBB_DEF_70_99_0	53	55	1.2%	872

Tableau 6. Sole de Manche Est. Débarquements 2013-2014 et effort moyen

Les débarquements de sole des bateaux français titulaires d'une licence sole représentent un peu plus de 40% des débarquements internationaux de sole. Les débarquements Français sont majoritairement réalisés par les fileyeurs 90-99mm qui représentent entre 20 et 25% des débarquements internationaux entre 2013 et 2014

La contribution de chaque flottille/métier à la mortalité par pêche totale est supposée proportionnelle à sa contribution aux débarquements totaux [sans prise en compte des diagrammes d'exploitation respectifs].

Pour un niveau de mortalité par pêche totale visée ( $F^*$ ), l'effort du métier  $m$  est donné par :

$$\text{Effort}_m(F^*) = \text{Effort}_m(F_{\text{actuel}}) \times F^* / F_{\text{actuel}}$$

Dans le cas où seuls les navires français titulaires d'une licence réduisent leur effort de pêche, alors :

$$\text{Effort}_m(F^*) = \text{Effort}_m(F_{\text{actuel-français}}) \times F^* / F_{\text{actuel-français}}$$

Les navires français titulaires d'une licence sole contribuant à un peu moins de la moitié des débarquements internationaux de sole en Manche est, la réduction de la mortalité (de l'effort de pêche) par les navires français seuls (l'effort des autres flottilles étant inchangés) serait un peu plus de deux fois plus importante que si la réduction est répartie/partagée par tous les acteurs.



a) Effort de pêche des fileyeurs 90-99mm

Dans l'hypothèse où le TAC 2015 est consommé, l'effort de pêche de ce métier serait, en 2015, de 7508 jours.

La figure 10 et le tableau 7 donnent les niveaux d'effort annuels nécessaires pour atteindre l'objectif FRMD en 2016, 2017, 2018, 2019 ou 2020.

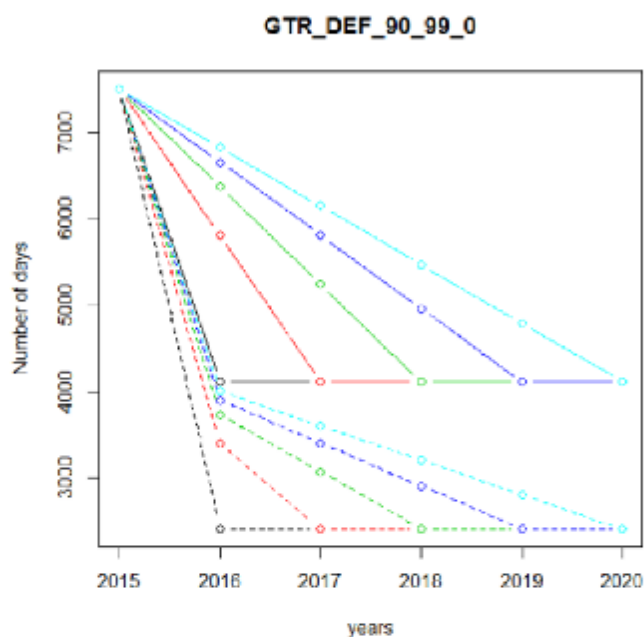


Figure 10 : Sole Manche Est. Effort de pêche (jours de mer) pour les fileyeurs 90-99mm en fonction de la date d'atteinte du  $F_{RMD}$ . (trait plein : réduction identique pour tous, pointillés : seuls les navires français ciblant la sole réduisent leur effort)

	2016	2017	2018	2019	2020
Fmsy en 2016	4116	4116	4116	4116	4116
Fmsy en 2017	5812	4116	4116	4116	4116
Fmsy en 2018	6377	5246	4116	4116	4116
Fmsy en 2019	6660	5812	4964	4116	4116
Fmsy en 2020	6829	6151	5472	4794	4116

Tableau 7 : Sole Manche Est- Effort de pêche (jours de mer) des fileyeurs 90-99mm en 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$ . (hypothèse où la réduction d'effort est appliquée à tous les acteurs)

Dans l'hypothèse où seuls les navires français devraient réduire leur effort de pêche, le niveau d'effort répondant à l'objectif  $F_{RMD}$  est, pour ce métier, de 2412 jours de mer.



b) Effort de pêche des chalutiers 70-99mm

Dans l'hypothèse où le TAC 2015 est consommé, l'effort de pêche de ce métier serait, en 2015, de 14542 jours.

La figure 11 et le tableau 8 donnent les niveaux d'effort annuels nécessaires pour atteindre l'objectif FRMD en 2016, 2017, 2018, 2019 ou 2020.

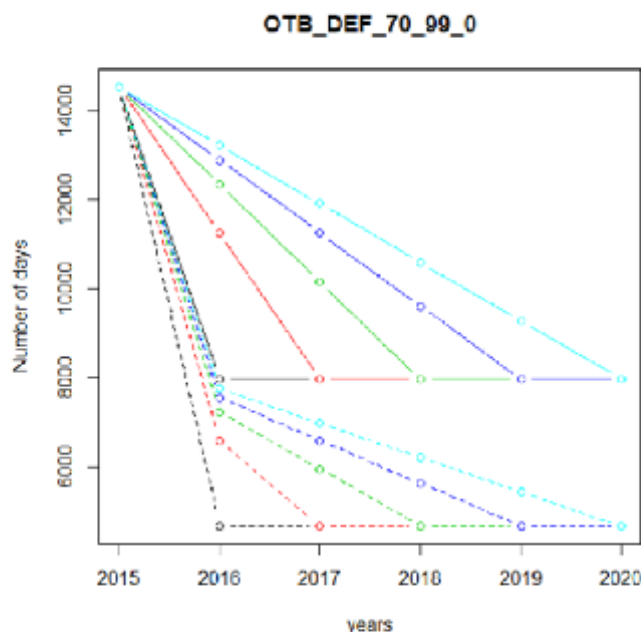


Figure 11 : Sole Manche Est. Effort de pêche (jours de mer) pour les chalutiers 70-99mm en fonction de la date d'atteinte du  $F_{RMD}$ . (trait plein : réduction identique pour tous, pointillés : seuls les navires français ciblant la sole réduisent leur effort)

	2016	2017	2018	2019	2020
Fmsy en 2016	7971	7971	7971	7971	7971
Fmsy en 2017	11256	7971	7971	7971	7971
Fmsy en 2018	12352	10161	7971	7971	7971
Fmsy en 2019	12899	11256	9614	7971	7971
Fmsy en 2020	13228	11914	10599	9285	7971

Tableau 8 : Sole Manche Est- Effort de pêche (jours de mer) des chalutiers 70-99mm en 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$ . (hypothèse où la réduction d'effort est appliquée à tous les acteurs)

Dans l'hypothèse où seuls les navires français devraient réduire leur effort de pêche, le niveau d'effort répondant à l'objectif  $F_{RMD}$  est, pour ce métier, de 4673 jours de mer.



### c) Effort de pêche des dragueurs >80mm

Dans l'hypothèse où le TAC 2015 est consommé, l'effort de pêche de ce métier serait, en 2015, de 1705 jours.

La figure 12 et le tableau 9 donnent les niveaux d'effort annuels nécessaires pour atteindre l'objectif FRMD en 2016, 2017, 2018, 2019 ou 2020.

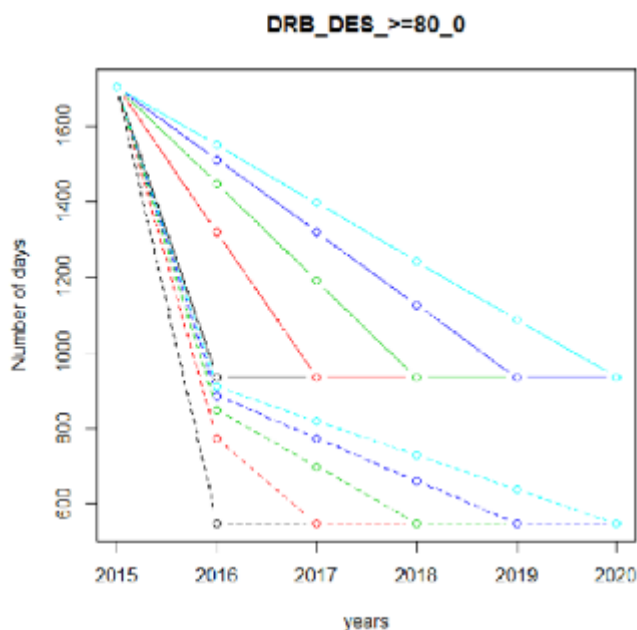


Figure 12 : Sole Manche Est. Effort de pêche (jours de mer) pour les dragueurs >80mm en fonction de la date d'atteinte du  $F_{RMD}$  (trait plein : réduction identique pour tous, pointillés : seuls les navires français ciblant la sole réduisent leur effort)

	2016	2017	2018	2019	2020
Fmsy en 2016	934	934	934	934	934
Fmsy en 2017	1319	934	934	934	934
Fmsy en 2018	1448	1191	934	934	934
Fmsy en 2019	1512	1319	1127	934	934
Fmsy en 2020	1550	1396	1242	1088	934

Tableau 9 : Sole Manche Est- Effort de pêche (jours de mer) des dragueurs >80mm en 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$  (hypothèse où la réduction d'effort est appliquée à tous les acteurs)

Dans l'hypothèse où seuls les navires français devraient réduire leur effort de pêche, le niveau d'effort répondant à l'objectif  $F_{RMD}$  est, pour ce métier, de 548 jours de mer.



#### d) Effort de pêche des fileyeurs 100-119mm

Dans l'hypothèse où le TAC 2015 est consommé, l'effort de pêche de ce métier serait, en 2015, de 661 jours.

La figure 13 et le tableau 10 donnent les niveaux d'effort annuels nécessaires pour atteindre l'objectif FRMD en 2016, 2017, 2018, 2019 ou 2020.

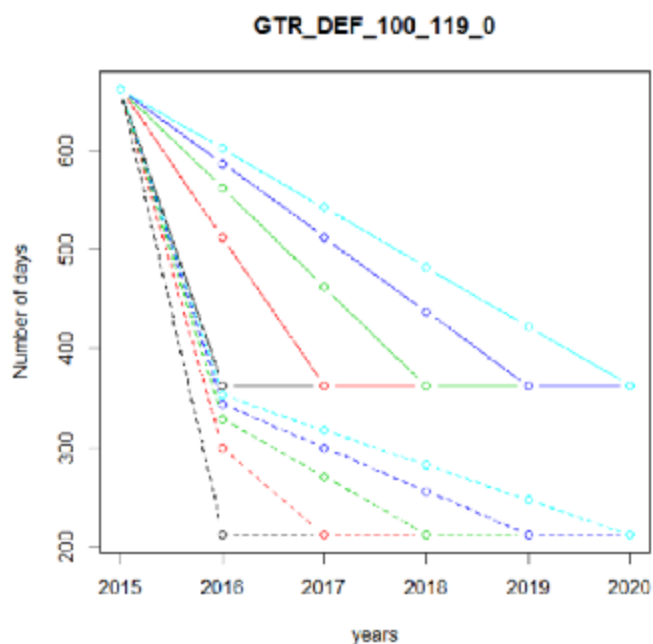


Figure 13 : Sole Manche Est. Effort de pêche (jours de mer) pour les fileyeurs 100-119mm en fonction de la date d'atteinte du  $F_{RMD}$  (trait plein : réduction identique pour tous, pointillés : seuls les navires français ciblant la sole réduisent leur effort)

	2016	2017	2018	2019	2020
Fmsy en 2016	362	362	362	362	362
Fmsy en 2017	512	362	362	362	362
Fmsy en 2018	562	462	362	362	362
Fmsy en 2019	587	512	437	362	362
Fmsy en 2020	602	542	482	422	362

Tableau 10 : Sole Manche Est- Effort de pêche (jours de mer) des fileyeurs 100-119mm en 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$  (hypothèse où la réduction d'effort est appliquée à tous les acteurs)

Dans l'hypothèse où seuls les navires français devraient réduire leur effort de pêche, le niveau d'effort répondant à l'objectif  $F_{RMD}$  est, pour ce métier, de 212 jours de mer.



e) Effort de pêche des navires regroupés sous le code chalutiers à perche 70-99mm

Dans l'hypothèse où le TAC 2015 est consommé, l'effort de pêche de ce métier serait, en 2015, de 931 jours.

La figure 14 et le tableau 11 donnent les niveaux d'effort annuels nécessaires pour atteindre l'objectif FRMD en 2016, 2017, 2018, 2019 ou 2020.

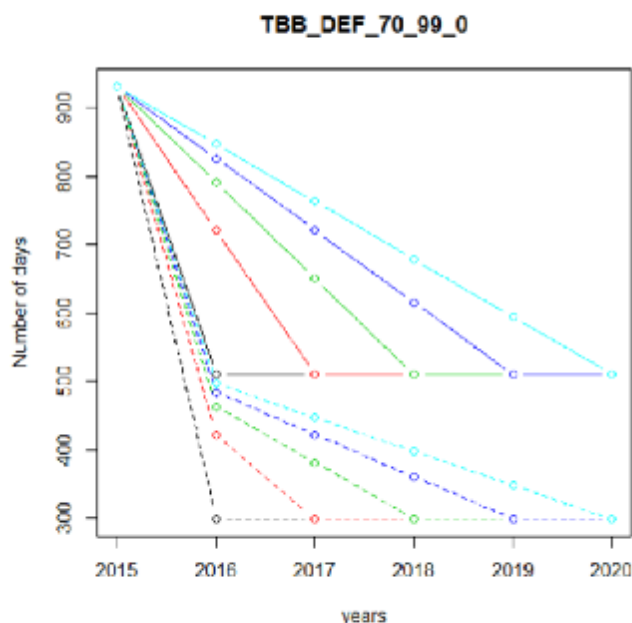


Figure 14 : Sole Manche Est. Effort de pêche (jours de mer) pour les TBB\_DEF\_70\_99mm en fonction de la date d'atteinte du  $F_{RMD}$ . (trait plein : réduction identique pour tous, pointillés : seuls les navires français ciblant la sole réduisent leur effort)

	2016	2017	2018	2019	2020
Fmsy en 2016	511	511	511	511	511
Fmsy en 2017	721	511	511	511	511
Fmsy en 2018	791	651	511	511	511
Fmsy en 2019	826	721	616	511	511
Fmsy en 2020	847	763	679	595	511

Tableau 11 : Sole Manche Est. Effort de pêche (jours de mer) des TBB\_DEF\_70\_99mm en 2016-2020 en fonction de l'année d'atteinte de  $F_{RMD}$ . (hypothèse où la réduction d'effort est appliquée à tous les acteurs)

Dans l'hypothèse où seuls les navires français devraient réduire leur effort de pêche, le niveau d'effort répondant à l'objectif  $F_{RMD}$  est, pour ce métier, de 299 jours de mer.



## Conclusion

La mortalité par pêche étant proportionnelle à l'effort de pêche (à capturabilité constante), **toute réduction de mortalité par pêche nécessite une diminution de l'effort de pêche** (et réciproquement).

Cette proportionnalité entre effort et mortalité ne se retrouve pas entre mortalité (effort) et captures. En effet les conséquences sur les captures d'une modification de la mortalité par pêche (et donc de l'effort de pêche) dépendent également de l'évolution de la biomasse disponible qui elle dépend de la pression de pêche, mais également des variations du recrutement.

En conséquence, si la biomasse augmente, une réduction de la mortalité par pêche peut ne pas entraîner une diminution des captures (voire même autoriser une augmentation). Réciproquement, si la biomasse diminue, le maintien de la mortalité par pêche (et de l'effort de pêche) entraîne une diminution des captures.

Il faut donc bien garder à l'esprit que toute modification de la mortalité par pêche nécessite une modification équivalente de l'effort de pêche, mais que les conséquences sur les captures ne sont pas obligatoirement proportionnelles. Ainsi, sauf dans le cas où, du fait de bons recrutements récents, la biomasse est en augmentation, **une diminution de la mortalité par pêche nécessite une diminution des captures**.

En ce qui concerne la sole de Manche Est, le TAC pour 2015 est tel (3483 tonnes) que pour l'atteindre, la mortalité par pêche doit augmenter de 28% (par rapport à la moyenne 2011-2013), alors qu'en 2014, l'avis du CIEM pour atteindre  $F_{RMD}$  en 2015 indiquait une réduction de la mortalité par pêche de 37% (et une diminution du TAC de 60%).

Si effectivement le TAC 2015 est consommé, cela signifie que l'effort à faire pour atteindre l'objectif RMD sera d'autant plus important.

Les résultats en valeur absolue des simulations dépendent des hypothèses influant sur la dynamique du stock et son exploitation. Les évolutions en relatif (gain/perte) sont elles plus robustes.

Plus la réduction de la mortalité par pêche et donc, dans ce cas, des débarquements est forte et rapide et plus l'objectif est atteint rapidement et les bénéfices attendus se font sentir (pour le stock et pour l'exploitation). A l'inverse, une réduction modérée retarde l'atteinte de l'objectif et nécessite une réduction continue sur plusieurs années. De plus, elle augmente la probabilité de rester à des niveaux faibles de biomasse dus à des faibles recrutements.

Compte tenu du niveau actuel de la biomasse de reproducteurs (très proche du seuil de précaution en 2015), une diminution rapide de la mortalité par pêche permettant une augmentation rapide de la quantité de reproducteurs est souhaitable. Le choix du scénario reste néanmoins de la responsabilité des gestionnaires.

Envisager un TAC constant sur plusieurs années pour faire baisser la mortalité par pêche nécessite que dans le même temps la biomasse du stock augmente, soit du fait de forts recrutements, soit comme conséquence d'un niveau d'exploitation modérée.

Dans la situation actuelle du stock de sole de Manche Est, la biomasse est supposée augmenter légèrement et donc le maintien du TAC actuel permet une légère diminution de la mortalité par pêche, mais en maintenant ce TAC 2015 jusqu'en 2020, la mortalité par pêche n'aura diminué que de 15% et restera très supérieure à  $F_{RMD}$ . Pour atteindre  $F_{RMD}$  en 2020, il faudrait ne pas pêcher plus de 3000 tonnes chaque année entre 2016 et 2020.



La réduction de la mortalité par pêche totale peut être obtenue par une baisse identique de l'effort de pêche pour chacune des composantes de la pêcherie, ou modulée selon les composantes. Ce choix appartient aux gestionnaires. Si seule une partie de la pêcherie est affectée, alors la réduction d'effort de pêche nécessaire sera plus importante.

Enfin, il convient de rappeler les conclusions de la réponse à la saisine 14-7340 (Vermard et al, 2014) qui indiquent qu'en plus de la nécessaire diminution de l'effort de pêche (et des captures), l'amélioration de l'état du stock passe également par une amélioration du diagramme d'exploitation (sélectivité) et la protection des zones de nurseries.



## Références

Biseau Alain (2014). **Simulations de l'évolution des débarquements de la Sole de Manche Est (Vild), en fonction de divers scénarios modulant la mortalité par pêche et/ou le diagramme d'exploitation.** DPMA - Direction des Pêches Maritimes et de l'Aquaculture, Ref. Ifremer PDG/AB/2014 - n°066 / Saisine DPMA n°14-6732, 2p., 3p., 17p.

Vermard Youen, Lehuta Sigrid, Savina-Rolland Marie, Biseau Alain (2014). **Evaluation de mesures de gestion pour l'exploitation de la sole en Manche est (sole Vild).** DPMA - Direction des Pêches Maritimes et de l'Aquaculture, Ref. Ifremer PDG/AB/2014 - n°14-137 / Saisine DPMA n° 14-7340, 2p., 2p., 25p.



## Annexe

Données utilisées pour les simulations (source : CIEM-WGNSSK-2014)

Age	N (2014)	F	M	Mat	CW	SW
1	23913	0.0007	0.1	0.00	0.1240	0.1023
2	3201	0.1230	0.1	0.00	0.1633	0.1467
3	5729	0.3788	0.1	1.00	0.1990	0.1797
4	7686	0.4056	0.1	1.00	0.2473	0.2467
5	13538	0.4065	0.1	1.00	0.2933	0.2867
6	4843	0.4627	0.1	1.00	0.3140	0.3197
7	2160	0.5146	0.1	1.00	0.3693	0.3777
8	399	0.4290	0.1	1.00	0.4000	0.4123
9	914	0.4690	0.1	1.00	0.4083	0.3950
10	491	0.3894	0.1	1.00	0.4157	0.4980
11+	283	0.3894	0.1	1.00	0.5255	0.5214

R2015 et suivants = 23913 \* min [1,B/Bpa]

F[3-8]2015 = 0.5473 (TAC 2015 consommé)