CEMP Guideline – FW3
Combined guideline for processing of survey data for fish and food webs common indicators FC2, FC3, FW3 and FW7

(OSPAR Agreement 2018-05)[1] [2]

This OSPAR biodiversity indicator is still in the early stages of implementation and as a result of iteration and learning, it is anticipated that there will be evolution of the methods and approaches documented in the CEMP guidelines. Version updates will be clearly indicated and be managed in a phased approach via ICG-COBAM through its expert groups and with the oversight and steer of BDC.

Contents

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[1] This document is in English only

[2] Update 2022

1   Introduction

The OSPAR indicators FC2-3 and FW3/7 require a common dataset derived from surveys of fish, which are processed to create an OSPAR Dataproduct. This guideline describes the origin of the data and links to the processing steps made that lead to the Dataproduct.

2   Monitoring

2.1 Purpose

The objective of the suite of indicators is to characterise fish communities (including demersal and pelagic species) in terms of their biomass, size structure and species composition in order to link to monitor fish biodiversity and food web structure and functioning.

2.2 Monitoring Strategy

Data come from scientific fisheries surveys which ideally sample the entire fish community. The metric requires that surveys are conducted at regular intervals (e.g. annually) in the same area with a standard gear.

Currently, the most important data source is the ICES co-ordinated fisheries groundfish surveys (ICES 2021a,b) which are conducted as part of the international bottom trawl survey programme in the North Sea, Celtic Seas, Bay of Biscay, Iberian coast and the eastern margin of the Atlantic region (see Figure 1). Beam trawl data is more suitable in some locations that are difficult to sample with the GOV or where the community is dominated by benthic species. For a few commercial pelagic species, biomass data from acoustic surveys, with supporting length samples from trawls, can be particularly useful and will be investigated further in future as data become available.

The resources needed for this suite of indicators are estimated to be high, but data collection costs are met primarily under the national programmes and the EU's Data Collection Framework (DCF).
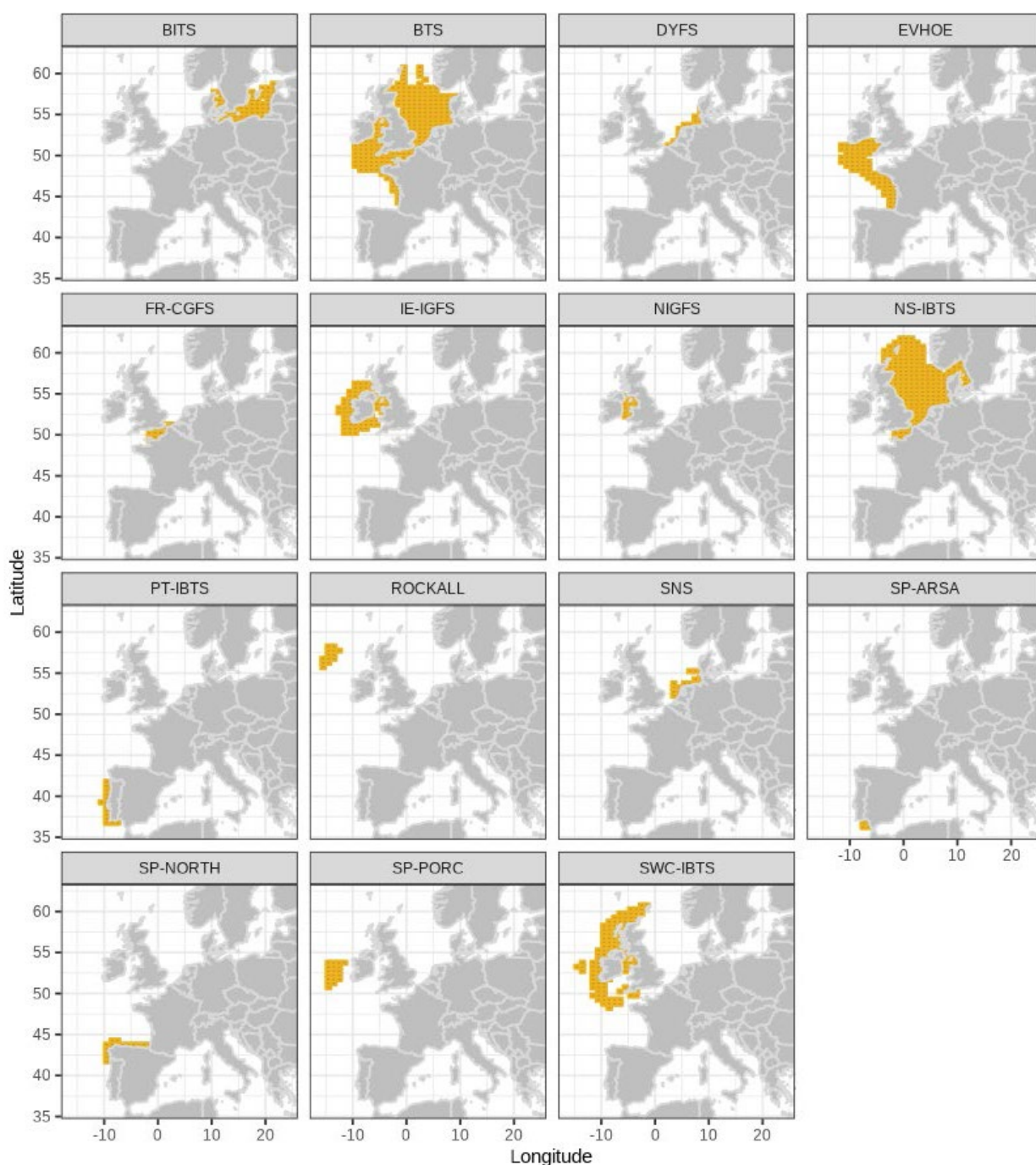
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Figure 1. Spatial coverage of the surveys processed by ICES 2021b.

ICES. 2021a. Workshop on the production of swept-area estimates for all hauls in DATRAS for biodiversity assessments (WKSAE-DATRAS). ICES Scientific Reports. 3:74. 77 pp. https://doi.org/10.17895/ices.pub.8232

ICES. 2021b. Workshop on the production of abundance estimates for sensitive species (WKABSENS). ICES Scientific Reports. 3:96. 115 pp. https://doi.org/10.17895/ices.pub.8299

2.3 Sampling Strategy

Species population characteristics are sampled by the surveys including: numbers of individuals by size class (length). Bottom trawls of various gears (including GOV and Beam) are made and to determine the area swept

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by the trawl the following parameters are recorded: tow duration, net opening (headline height), wingspread or beam width, depth and distance towed.

Fish and elasmobranch mass at length values are estimated from numbers by size class using length-weight relationships for each species (from national data or extracted from www.fishbase.org).

2.4 Quality assurance/ Quality Control

ICES Data Centre host the database of trawl surveys for groundfish and beam trawl data (DATRAS). DATRAS has an integrated quality check utility. All data, before entering the database, have to pass an extensive quality check. Despite this errors and missing data arise, which are subsequently dealt with by the data submitters from the contributing countries as required. However, this screening process was implemented in 2009 for data from 2004 onwards. Since some survey time-series extend back to the 1960s, historic data (unless re-evaluated and re-submitted by contributing countries) may not have been subject to the same level of quality control as these more recent data. Furthermore, the type of information collected, the level of detail and resolution in the data, has gradually evolved over time. In order to derive a single format, quality assured monitoring programme data product covering the entire Northeast Atlantic region inconsistencies in the datasets required resolution. In many instances, particularly in the more historic data, key information on duration of sampling or distance towed is either absent or incorrect, and these missing or erroneous values need replacement by modelled estimates. These corrections are detailed in ICES 2021a,b:

Biological data for trawl surveys are downloaded directly from DATRAS in raw exchange format (known as "HL data"). Ancillary data were processed by ICES 2021a,b to create the "SweptAreaAssessmentOuput" (which replaces the "HH data") and these were downloaded from the same location:

https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx

For these fish and foodweb indicators, the data are processed to create a standalone OSPAR dataproduct on species catch rate (density per swept area) per haul (Lynam et al. 2022). Initially, hauls are subset to determine the Standard Monitoring Programme (i.e. excluding hauls of duration shorter than 13 minutes or longer than 66 minutes) and these hauls are used to define the Standard Survey Area (excluding areas sampled infrequently over time) following the methods detailed in Greenstreet and Moriarty 2017). Additional QA/QC is made at this step to determine if species identification issues are present in the raw biological data. The standard survey area and hauls utilised in the assessment are shown in Figure 2. The ecological subdivisions used within the assessments are shown in Figure 3 along with the hauls available in each area in Figure 4.

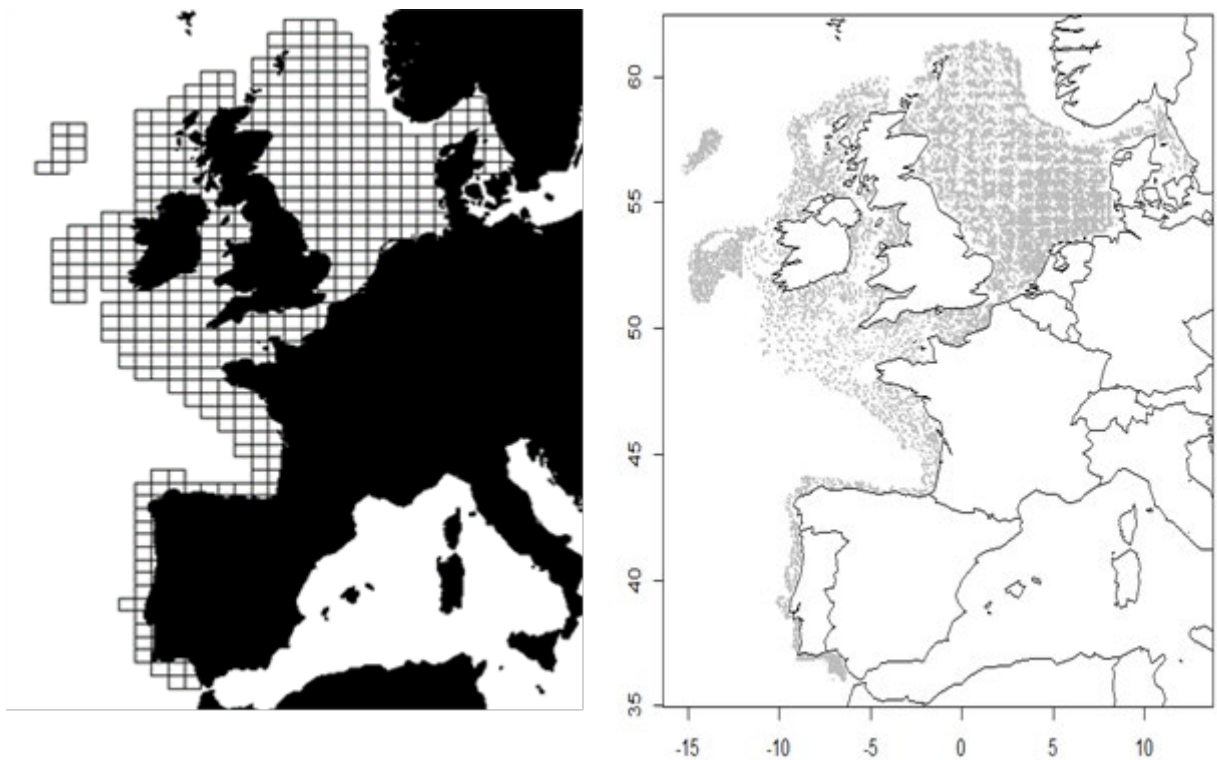Lynam et al (2022). A data product derived from Northeast Atlantic groundfish data from scientific trawl surveys 1983-2020. Cefas, UK. V1. doi: https://doi.org/10.14466/CefasDataHub.126

Figure 2. The combined (all survey) standard survey area and hauls utilised (1983:2020)
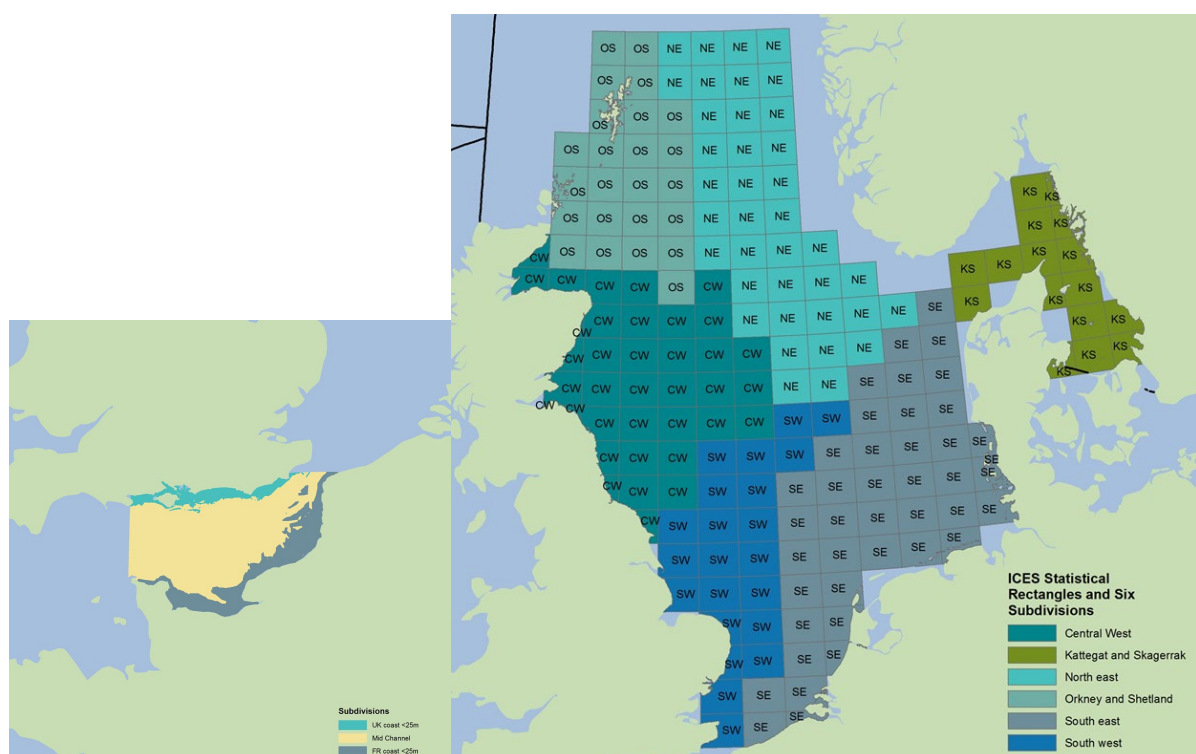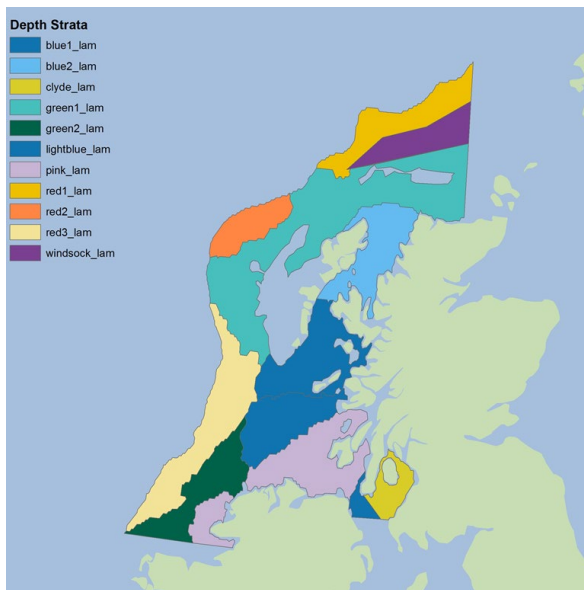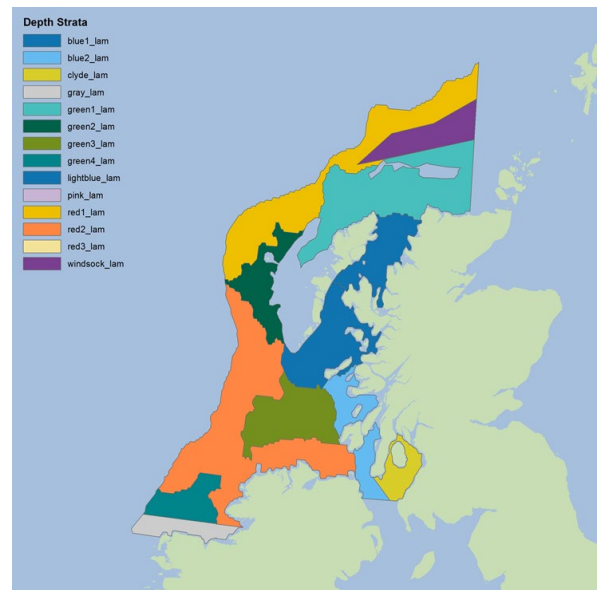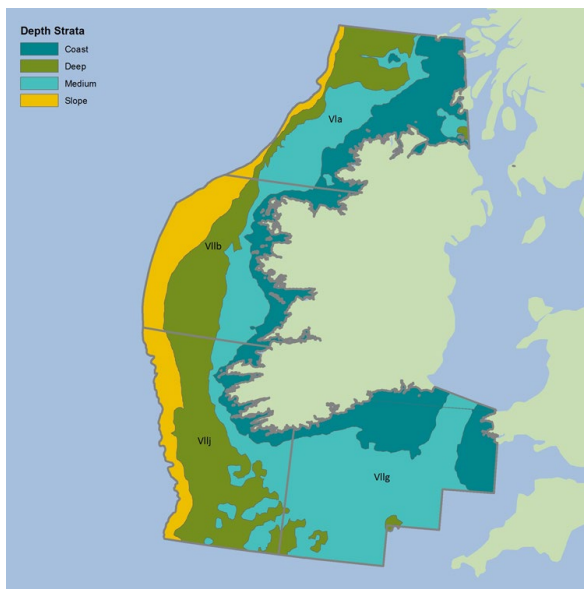

Figure 3a Ecological subdivisions within OSPAR Greater North Sea Region II (English Channel, left, and North Sea and Kattegat, right).
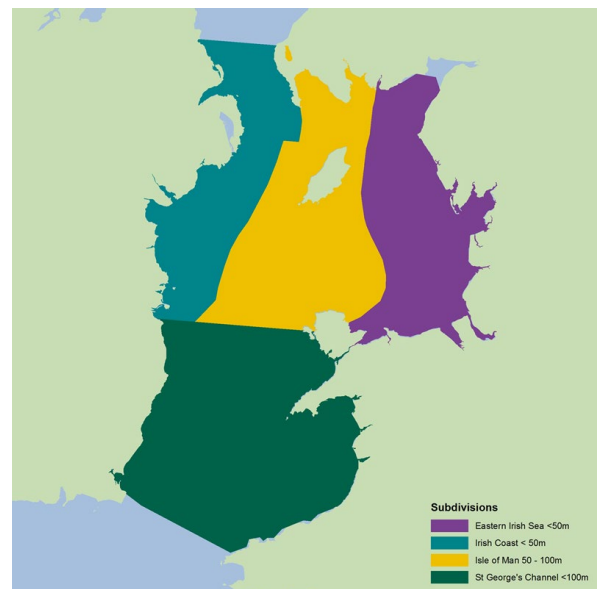
Depth Strata
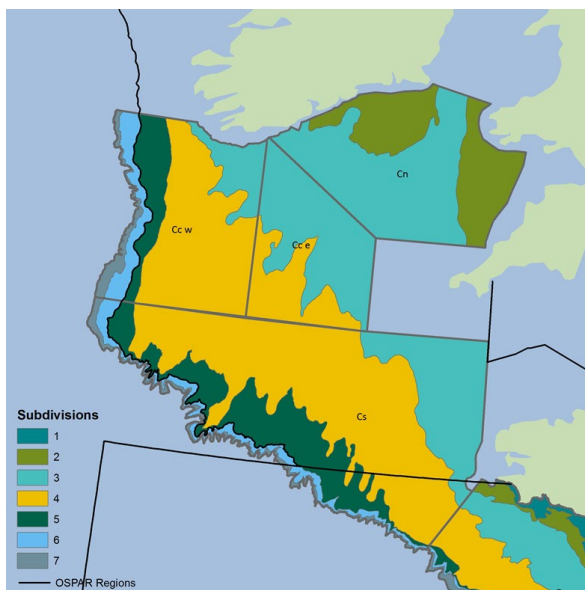- blue1_lam
- blue2_lam
- clyde_lam
- green1_lam
- green2_lam
- lightblue_lam
- pink_lam
- red1_lam
- red2_lam
- red3_lam
- windsock_lam

CSScoOT1

Depth Strata
- blue1_lam
- blue2_lam
- clyde_lam
- gray_lam
- green1_lam
- green2_lam
- green3_lam
- green4_lam
- lightblue_lam
- pink_lam
- red1_lam
- red2_lam
- red3_lam
- windsock_lam

CSScoOT4

Depth Strata
- Coast
- Deep
- Medium
- Slope

CSIreOT4

Subdivisions
- Eastern Irish Sea <50m
- Irish Coast < 50m
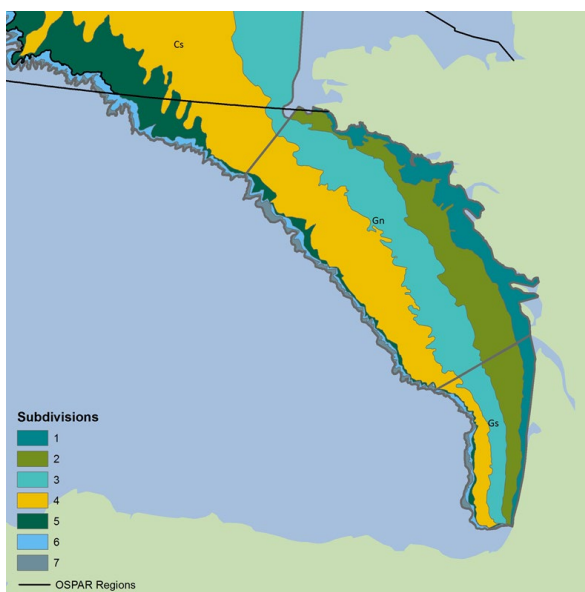- Isle of Man 50 - 100m
- St George's Channel <100m

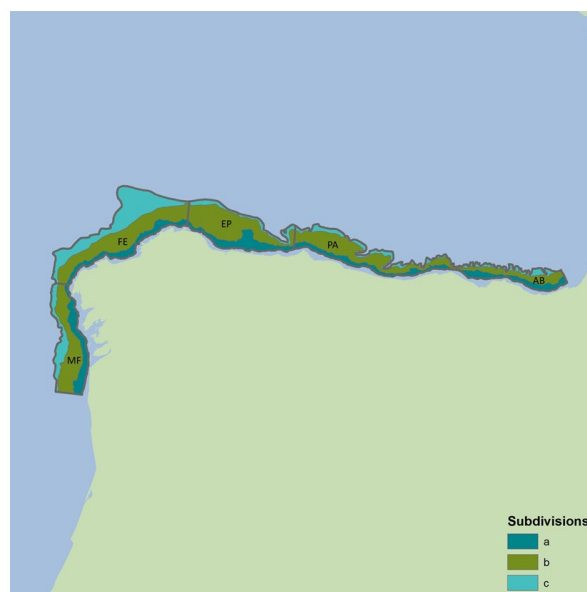Irish Sea: CSEngBT3, CSNIrOT1 and CSNIrOT4

Celtic Sea strata from CSFraOT4 survey (data
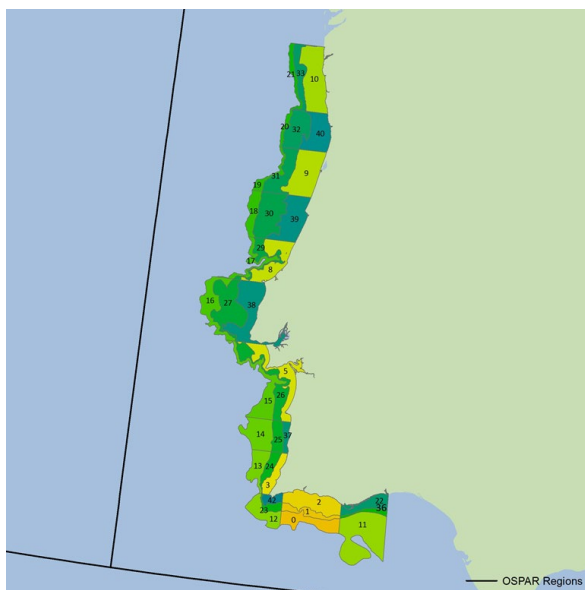located above 48°N only)

Figure 3b Ecological subdivisions within OSPAR Celtic Seas Region III
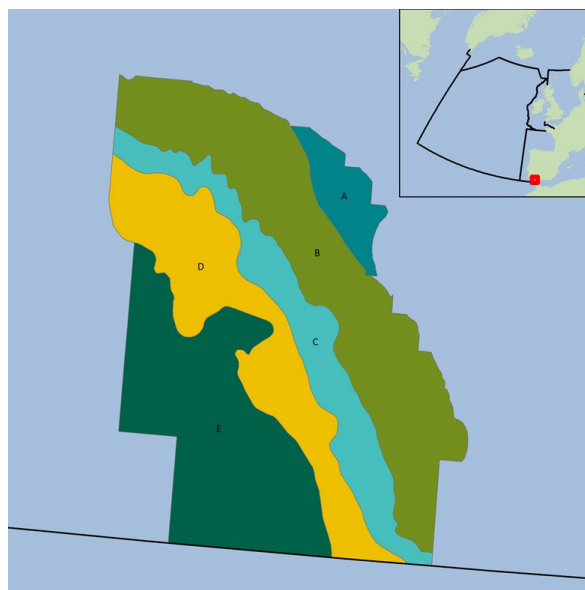

BBICFraOT4 (south of 48°N) and BBICFraBT4

BBICnSpaOT4

BBICPorOT4   BBICsSpaOT1 and BBICsSpaOT4

Figure 3c Ecological subdivisions within OSPAR Bay of Biscay and Iberian Coast Region IV
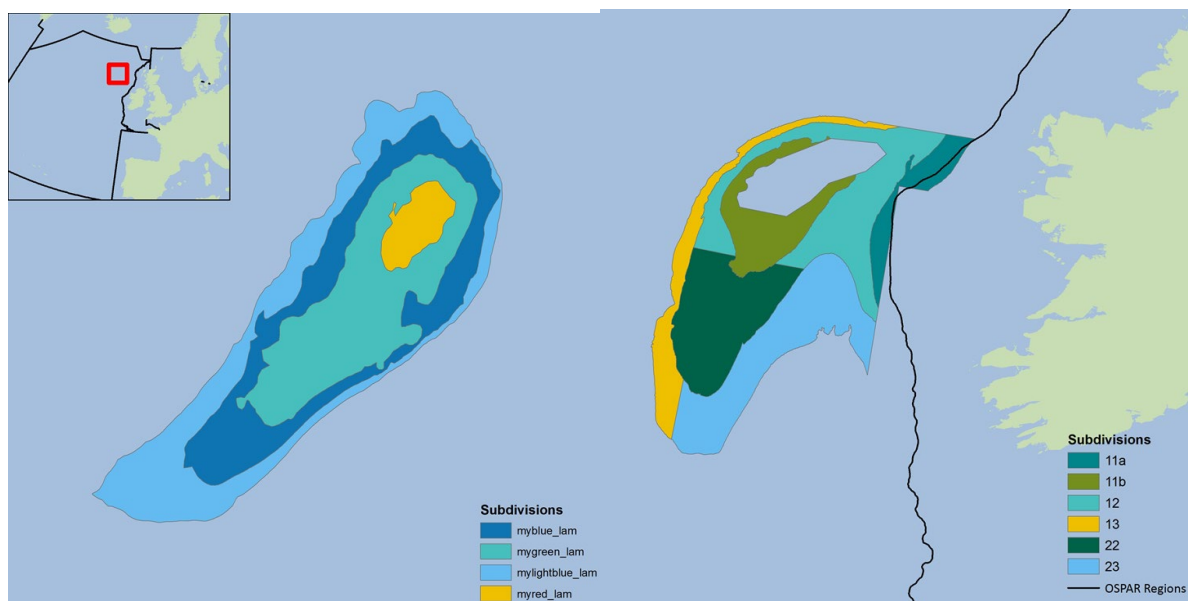

Figure 3d Ecological subdivisions within OSPAR Wider Atlantic Region V: WAScoOT3 "Rockall Bank" left and WASpaOT3 "Porcupine Bank" right.
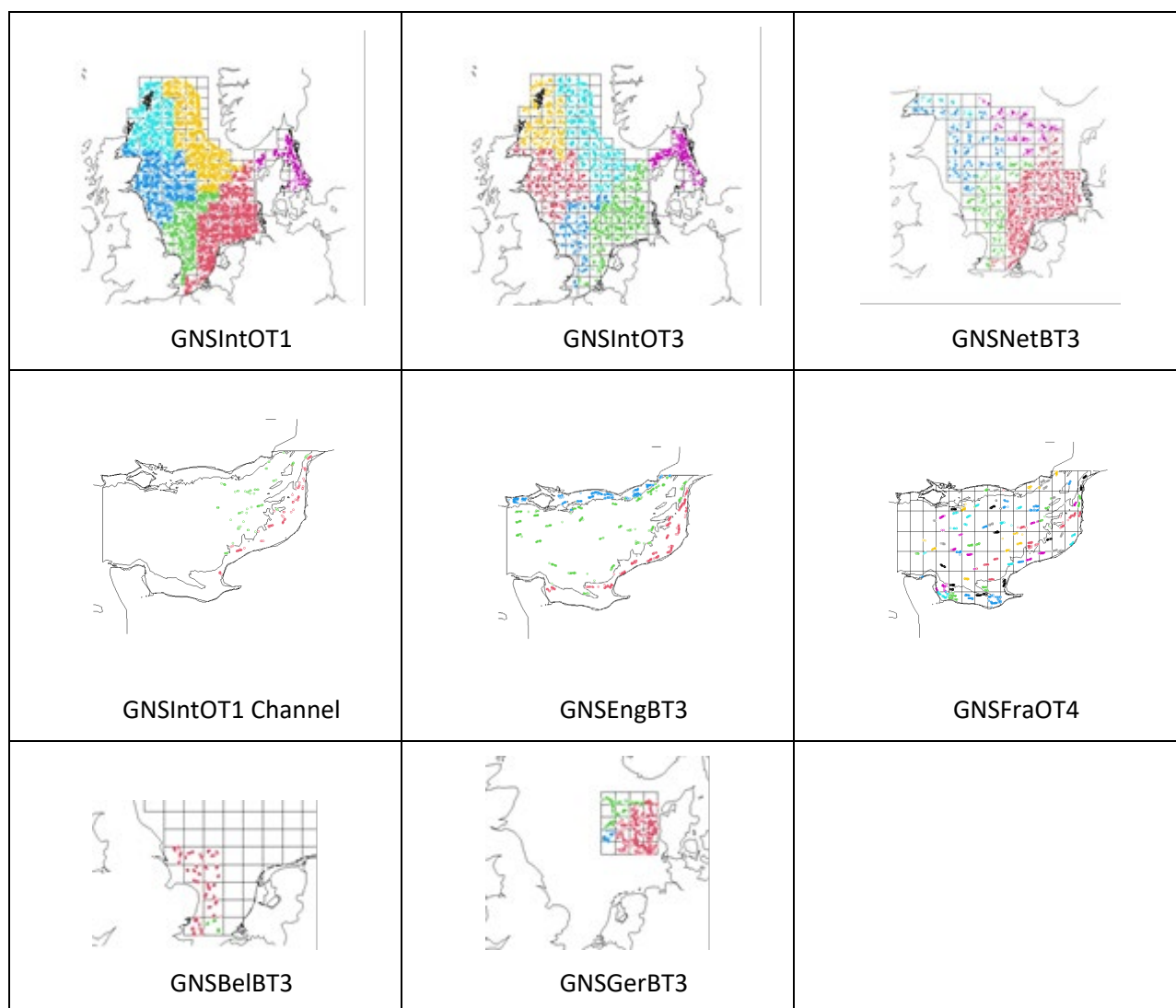
Figure 4a. Standard survey area for Greater North Sea surveys showing hauls utilised coloured by survey strata.

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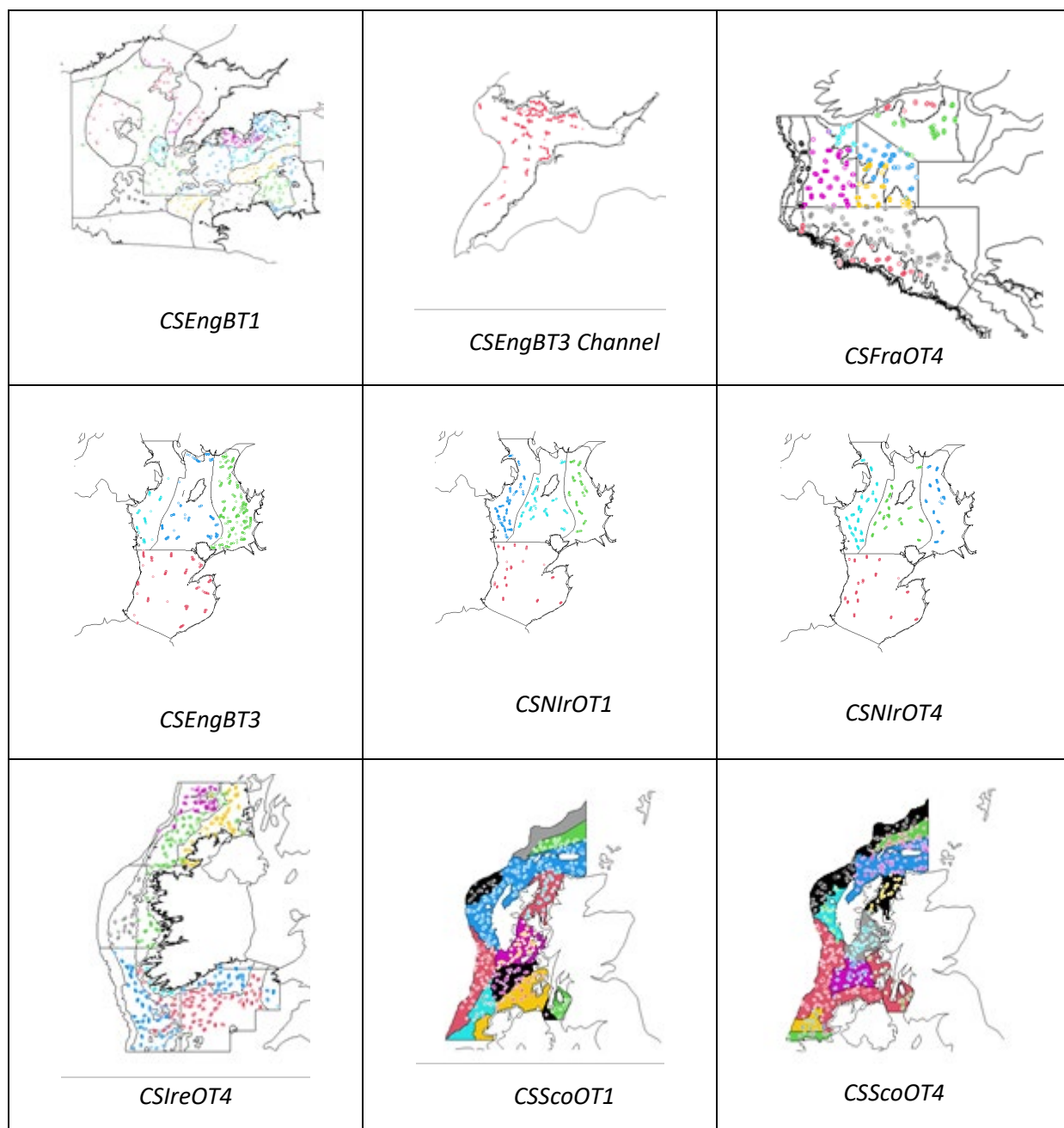
Figure 4b. Standard survey area for Celtic Seas surveys showing hauls utilised coloured by survey strata.

BBICFraBT4	BBICFraOT4	BBICnSpaBT4
BBICPorOT4	BBICsSpaOT4	BBICsSpaOT1
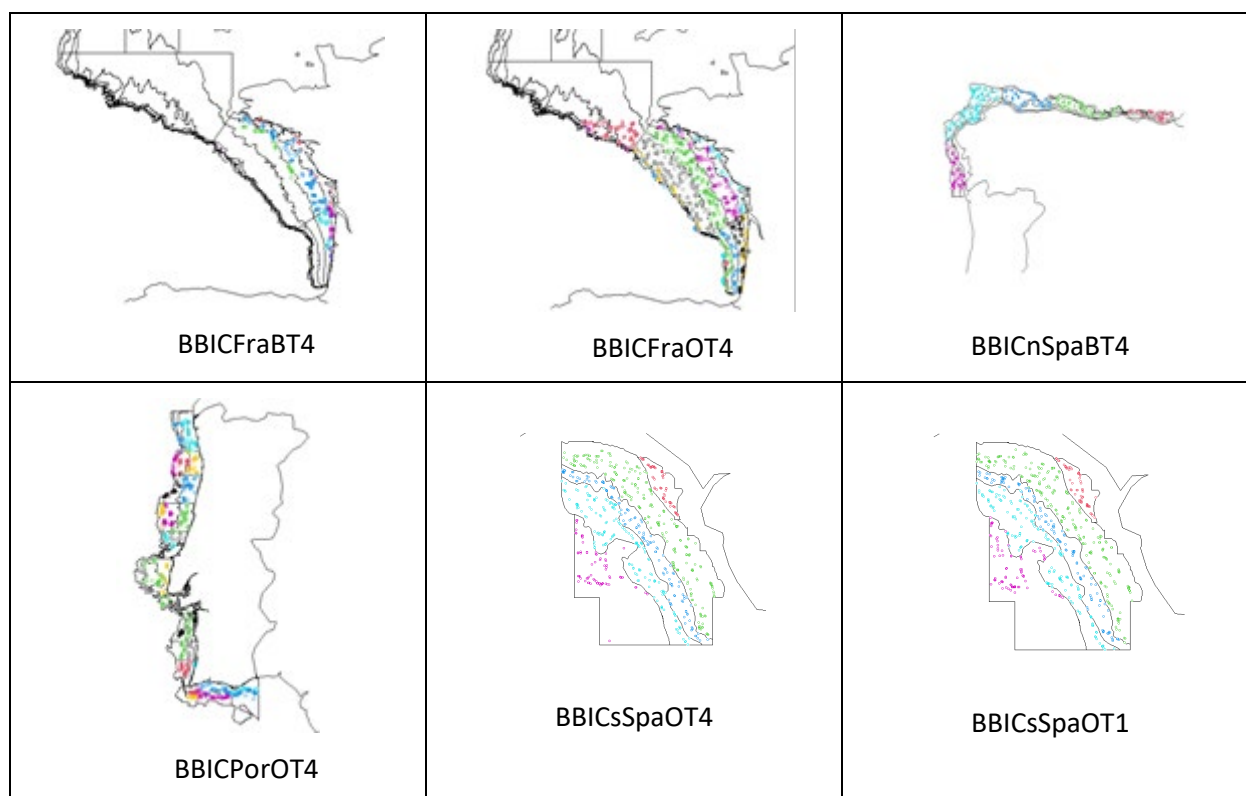
Figure 4c. Standard survey area for Bay of Biscay and Iberian coast surveys showing hauls utilised coloured by survey strata

WAScoOT3	WASpaOT3

Figure 4d. Standard survey area for Wider Atlantic surveys showing hauls utilised coloured by survey strata

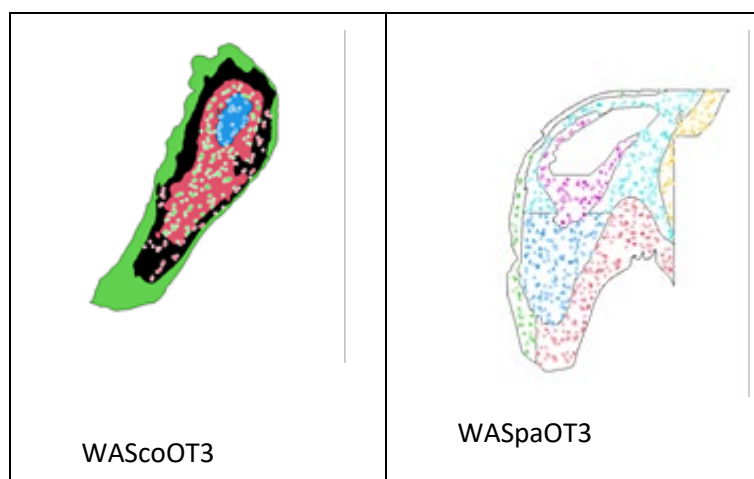## 2.5 Data reporting, handling and management

Groundfish and beam trawl survey data are submitted to the Database of Trawl Surveys (DATRAS):

http://www.ices.dk/marine-data/data-portals/Pages/DATRAS.aspx

The DATRAS reporting format is detailed online:

https://datras.ices.dk/Data_products/ReportingFormat.aspx

The metadata relating to the ICES co-ordinated surveys are available here:

http://www.ices.dk/marine-data/data-portals/Pages/DATRAS-Docs.aspx

3 Assessment

3.1 Data acquisition

Biological data for groundfish and beam trawl surveys are currently downloaded directly from DATRAS in raw exchange format (known as "HL data"). Ancillary data were processed by ICES 2021a,b to create the "SweptAreaAssessmentOuput" and these were downloaded from the same location:

https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx

3.2 Preparation of data

The data are processed to create a standalone OSPAR dataproduct on occurrence, numbers and biomass of individuals by size class standardised to unit swept area for each haul. Initially, hauls are subset to determine the Standard Monitoring Programme (i.e. excluding hauls of duration shorter than 13 minutes or longer than 66 minutes) and these hauls are used to define the Standard Survey Area (excluding areas sampled infrequently over time) following the methods detailed in Moriarty et al. (2017). Additional QA/QC is made at this step where species identification issues are detected or units of length measurements are found to be incorrectly present in the raw DATRAS data (i.e. data recorded in mm entered into DATRAS with length code corresponding to cm).

Table 1. Groundfish surveys by region and period over which they have been undertaken consistently)				
OSPAR Region	MSFD Region	Survey Acronym	Survey Period	Depth range (m)
Celtic Seas	Celtic Seas	CSFraOT4	1997 – 2020 (no data 2017)	59 - 372
		CSEngBT1	2016 - 2019	NA
		CSEngBT3	1993 - 2019	9 - 135
		CSEngBT3_ Bchannel	1993 - 2020	11 - 75
		CSIreOT4	2003 - 2020	13 - 260
		CSNIrOT1	2008 - 2020	12 - 120
		CSNIrOT4	2009 - 2020	10 - 191

		CSScoOT1	1985 - 2020	44 - 470
		CSScoOT4	1997 - 2020	40 - 450
Wider Atlantic		WAScoOT3	1999 - 2020	122 - 255
		WASpaOT3	2006 - 2020	188 - 787
Greater North Sea	Greater North Sea	GNSEngBT3	1990 - 2020	8 - 81
		GNSFraOT4	1998 - 2020	8 - 82
		GNSGerBT3	1997 - 2020	14 - 125
		GNSIntOT1	1983 - 2020	10 - 245
		GNSIntOT1_channel	2007 - 2020	20 - 98
		GNSIntOT3	1998 - 2020	13 - 280
		GNSNetBT3	1999 - 2020	11 - 204
		GNSBelBT3	2004 - 2020	12 - 70
Bay of Biscay and Iberian Coast	Bay of Biscay and Iberian Coast	BBIC(n)SpaOT4	2011 - 2018	77 - 459
		BBIC(s)SpaOT1	1996 - 2020	19 - 752
		BBIC(s)SpaOT4	2002 - 2020	19 - 770
		BBICPorOT4	2005 – 2018 (no data 2012)	19 - 538
		BBICFraBT4	2011 - 2020	9 - 250
		BBICFraOT4	1997 - 2020	10 - 587

Acronym convention: First 2–4 capitalised letters indicate the OSPAR region (CS: Celtic Seas; GNS: Greater North Sea; BBIC: Bay of Biscay and Iberian Coast; WA: Wider Atlantic). Next capitalised and lowercase letters indicate the country involved (Fra: France; Eng: England; Ire: Republic of Ireland; NIr: Northern Ireland; Sco: Scotland; Ger: Germany; Int: International; Net: Netherlands; Bel: Belgium; Por: Portugal; Spa: Spain). International refers to the two international bottom trawl surveys carried out in the North Sea and coordinated by the International Council for the Exploration of the Sea (ICES). Next two capitalised letters indicate the type of survey (OT: otter trawl; BT: beam trawl). Final number indicates the season in which the survey is primarily undertaken (1: January–March; 3: July–September; 4: October–December). Note: survey WAScoOT3 has been included in MSFD Celtic Seas region, but some of the survey area lies outside of the regional boundary.

3.3 Assessment criteria, analysis, presentation of assessment results

Assessment criteria, analyses and presentation of results are explained and shown for each indicator in the IA2017 (in particular section: Assessment Method):

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https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/biodiversity-status/fish-and-food-webs/

4   Change Management

Responsibility for follow up of the assessments is with the Biodiversity Committee though the ICG-COBAM in particular the expert groups on Fish and Food webs.

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